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NEW YORK, SATURDAY, MAY 4, 1895.

Contents.

(Illustrated articles are marked with an asterisk.)

280 278 285 278 278 278 274 275

TABLE OF CONTENTS OF SCIENTIFIC AMERICAN SUPPLEMENT No. 1009.

For the Week Ending May 4, 1895. Price 10 cents. For sale by all newsdealers.

16125 16126 16126

illustration..... V. CH EMISTRY.—Terrestrial Helium (?).—A new gas obtained from the mineral cleveite.—Possibility of the discovery of helium 16128 VI. HORTICULTURE.—The Noblest of Evergreen Climbers.—A plea for the ivies.—Their value in the art of the landscape gar-

16125 lener. MECHANICAL ENGINEERING.—Horizontal Band Saw.—A lowerful tool for cutting planks from the log.—2 illustrations..... 16132

11. METALURGY-Silver Alloys.—By G. J. FowLER.—Recent experiments in the production of a white silver alloy capable of electro deposition. 16133

THE ADVANCED SYSTEM OF EDUCATION.

work. We have frequently illustrated typical insti- opment of the advanced system of education. tutes where these advanced doctrines held sway, the Teachers' College, of this city, being the most recent presentation of the kind alluded to.

In considering the change in educational methods, doors no better equipped than their predecessors of fifty or a hundred years ago?

to the front, and, encountering obstacle after obstacle, only grew stronger with opposition. The annals of invention are full of veritable romances of the type indicated. Leaving aside the winners in the race for political preferment and taking into account only the instance. ately.

The new system of education, based on the concrete irritation in the insusceptibility to mechanical or sciwhich they ride.

about us have been cited by students of education who extinction. have examined pupils of the old time system of schools. Tests have been applied by asking the dimensions of objects, with the strangest discrepancies in statement. for instance, in the public schools of Cleveland, will properly and cooked fresh. Even as produced artifithe drawings by the pupils show a reasonable amount vile and rotting filth of every description which is

The independent scientist and inventor will be unaf The educational question is one which engages more fected. They will still hold their pre-eminence and attention every year. Formerly the teacher's art was genius, as hitherto; will be uneclipsed by educated supposed to consist in instilling into the pupil's mind mediocrity. The training of the average mind will the contents of books. Directly or indirectly, school simply give a better equipped and more appreciative education was book education. But now a change audience for their achievements. The occasional achas come over the spirit of education, and manual cession to the ranks of inventors and discoverers which training and cultivation of the spirit of observation such schools may develop will be a service worth all have been erected into important elements of school the thought, time and trouble expended on the devel-

Alabaster Mines.

Thirty-two miles to the southeast of Pisa, in the province of that name, a very remarkable and very a very curious point is met-what effect will the ancient industry is carried on. We refer to the alaextensive introduction of manual and observational baster industry, of which a full description from actual training have on the next generation in the realms of observation is given by Vice-Consul Carmichael, of invention and science? Hitherto, by the outside Leghorn, in a foreign post office report just issued. world, the inventor has been regarded as the embodi- Volterra, where the alabaster is found, enjoys special ment of distinct genius-even the highest courts have distinction among places in the world which produce so spoken of him, however pronounced their minimiz- that commodity. The material, which is of five main ing tendency may be at present. The distinguished varieties, is found in nodules embedded in huge masses scientist is regarded as a specialized organization-as of limestone. At the end of each cavern whence it is one adapted by nature for difficult research. Is there extracted, two or three men are to be seen working any probability that a school which teaches drawing away with small T-shaped picks by the dim light of and which keeps up the instruction for the years of unprotected oil lamps of Etruscan pattern, which, by its course-which teaches boy and girl alike the use of a singular tenacity of tradition, are still in use in the their hands and brain in all the departments of man-district. In one case the block of alabaster will be ual training, whose pupils execute individual work in already well projected from its bed of limestone, and constructing physical apparatus-is it probable that; the operator is carefully picking away all around it in such a school will produce a series of scientists and in- order to extricate the complete block. The larger the ventors, or will the pupils, after all is done, leave its specimen. the more valuable it is in proportion to its weight. In another, search is still being made for the alabaster, and the workman is vigorously beating down In the old order of things there was a quality of rug- the wall of limestone until he lights upon the white gedness evoked in the successful man, perhaps at nose of what looks like a block. He then picks away heavy expense of the weaker ones, which elicits our carefully, so as not to injure the prize. When there admiration. The United States has been prolific of seems a likelihood of a large quantity of limestone men who, without any advantages, worked their way having to be removed, blasting with gunpowder is resorted to.

The alabaster industry dates back to classic times. Great changes have taken place in it, however, within living memory. In former days there were three distinct classes of workmen engaged in the work of fashventor and scientist, we cannot but feel that, in the ioning the raw material-the master artist, who owned frequent asperity of the conditions of the lives and en-; a workshop and employed numerous workers, selling vironments of the great workers of the age, there is to his products direct to the alabaster shops or "gallebe found a school of differentiation adapted to bring ries;" the journeymen and the travelers, men who took the qualities of the strong into greater relief. Under huge cases of the goods and sold them as they went milder conditions the strong might lack the very in- along in all the countries of the world, civilized and centives supplied by the passive resistance of circum- uncivilized. Of these, two, the master worker and the But the weak would advance proportion- traveler, are now extinct species. Nowadays, three men, usually relatives, work together in informal partnership, one being a turner, another a modeler, and instead of the abstract, will be unquestionably a great 'the third a decorator, who carves such decorative adadvance and benefit to the country. There is for one juncts on the finished articles as fruit and flowers. with any bent for mechanics or science an absolute Their gains are very small, and, indeed, travelers who put in at the port of Leghorn and have alabaster vases, entific things so often to be found in the everyday statuary and the like offered at almost absurdly low world. Thousands of people are content to travel on prices refuse, as a rule, to believe that they can be steam or electric roads without knowing the least made by hand. One kind of alabaster is made by a thing of the prime motor which propels the cars in process of dyeing, which is still a trade secret, into an excellent imitation of coral. For a time this has had Most astonishing examples of ignorance of things a very large sale, but the trade is now threatened with

Mushrooms and Manure Heaps.

As grown in old grass pastures, mushrooms are But a child who has followed such a course as is given, agreeable and excellent eating, especially if cooked have a very strong idea of the relation of things. The cially for the market, they are often quite wholesome, annual report of the Board of Education of that city if washed clean and cooked early. But, as is well shows a remarkable development of work along the known, says the Lancet (London), mushrooms belong line of observation and manual practice. Examples to an order of vegetables of a somewhat low organizaof drawing executed in the different classes show that tion, and they grow and reproduce themselves with rethe lessons in the real things of life begin with the markable rapidity when sown in decomposing vegetayounger pupils. The illustrations show a whole class ble matter. Many growers take advantage of this fact of children drawing from the life, some of their co- to cultivate mushrooms on manure heaps-heaps, that pupils serving as models. Numerous reproductions of is to say, not of ordinary farmyard manure, but of the of success in what the educated artist finds a difficult gathered together in large towns and delivered to task to do adequately. In the higher grades some suburban and country mushroom growers by horse

W MINICA A CONT. Descione Officer and Harman Distinguish	lask to ut auequa
IX. MINERALOGY.—Precious Stones and How to Distinguish Them.—A very excellent paper on practical determination of the	really excellent wor
jeweler's minerals	The above report
X. NAVAL ENGINEERING.—Novelties in Steam Launches.— Launches recently exhibited at the Royal Aquarium, London, in- cluding a napbtba launch made of aluminum	of the modern the
The Battlesbips Magnificent and Charlemagne-A Comparison. —Two new types of battlesbips represented now in English and	change is not in th
French sbipyards2 illustrations	in the way of devel
warship recently lost at sea1 illustration 16131	science who is gre
XI. PALEONTOLOGYTrilobitesA valuable contribution to the bistory of these numerous inhabitants of the waters of past	The inventor will lo
ages.—The last views of their structure	ground will be a mo
XII. PHYSICS.—Waves and Vibrations.—A very interesting paper on wave motion under different conditions from the standpoint of the physicist	The new system v
XIII. PHYSIOLOGY - Door a Nucleur exist in the Red Co-purches of	investigators, but w
Mammalian Blood ? By Prof. John Michels, An examination into the nature of the blood by the late Chief Microscopist, Bureau of Animal Industry Uptical Stotes Chief Microscopist,	lities required by th
culture -Of special interest at the present are of inculture	nature. The object
	is not to make arti
the mechanism of the muscular system of man	lesson given by the
XIV. PSYCHOLOGYPsychologyBy E. B TITCHENERA con- tribution to this subject now attracting somuch attention 16121	chanic's art as in th
XV. TECHNOLOGYSilver Gray Roofing TileHow to make roof- ingtileFull directions for carrying out the details of the pro-	object of manual tr
cess 1 blustration	and often misappre
ried out in this country	is not to have its
XVI. TRAVEL AND EXPLORATION. —The Country of the Brass- men.—An interesting account of an African tribe of the Niger	successful carpenter
region.—1 illustration	ates. It will prove
XVII. ZOOLOGYThe Barrier Reef of AustraliaForms of ma- rine life found in the Australian region5 illustrations	and the effects on t

k is shown. wagon or train. Now, plants take up into themselves

is merely cited as an embodiment the very stuff, modified, on which they grow. Mushory of teaching the young. The rooms grown on matter of this sort select from it those ne way of restraining genius—it is parts which they are able to assimilate. But the arloping mediocrity. The worker in 'rangement of the "cap" of the mushroom enables it eat will still tower above the rest. also to absorb the vapor of the manure, which is a ose none of his fame. But the backdangerous poison to man and other animals. Thus ore pleasing one. the scores or hundreds of radiating plates of which will not produce an army of great they principally consist are in practice little better

ill raise the general level. The qua-than traps for the catching and retaining of more ne specialist must be implanted by deadly poisons still.

of the drawing lesson in the school

sts, but to teach observation—the

Improved Paving.

The material consists of concrete made of small lathe is not so much in the mehe use of the hands and eyes. The lumps of emery stone set in Portland cement. The aining is at once easily understood emery may be in pieces varying from half an inch in ehended. The school employing it diameter down to a powder, and is mixed with Portsuccess gaged by the number of land cement in the proportion of three parts of emery rs or machinists among its gradu-ⁱ to two of cement. The composition prepared in this e its worth by the general results way is used to face ordinary concrete slabs, constituthe character of the pupils. 'ing a wearing surface for paving flags, steps, etc.

Tar Products.

A paper on this subject was recently read before coloration, because it no longer contained silver. the Society of Chemical Industry, London, by A. P. Laurie, M.A., who said, the method has been to grind a little of the pigment into a stiff paste with water, 0.1150 gr. of gold=98.97 per cent of the quantity and then to dilute with more water and a few drops of a strong solution of pure gum arabic. This dilu-tity of the precions metal that had been used. The tion was practically the same in each case, and was so advantages that this method has over the sulphite of adjusted that, on stirring up the diluted pigment, were laid upon Whatman paper in five coats, each coat laboratory. Zinc dust allows the operation to be more covering less of the surface than the one laid on before, rapidly performed than with the metal in sheets. On so that at the end, on the top of my strip of paper, I had a layer of color five coats thick, and a series of when they are in small quantities, are more regularly coats lying in steps down the paper, till at the bottom distributed through the pulverulent matter. It follows Under them and shutting in the cash drawer there 1 had only one coat of color. These washes were so that in filtering there is less danger of loss. One condi- is the third door with its own lock and bolts. In this regulated in strength that they were not so weak as tion of success is to use exact quantities, say five times safe the size of the cash repository bears about the to make one and two indistinct, and not so strong as the supposed quantity of the precious metal, then to same relation to the size of the whole safe as a pumpto make five and four indistinct. In practice, I get in this way coats closely corresponding for different pig- distribute the zinc powder in the solution. ments in the strength of coloring effect that they represent, and while this is, of course, far from a perfect method proposed by Dr. Stiebel offers some danger by amount of heat that any burning building could give it. method, it yields results which are sufficiently good the possible presence of arsenic in the zinc powder, for practical purposes.

In practice I cut a little portion from the top of my washes of the pigments, and attached it with a piece having a good draught.-Paris Photographe; Wilson's of gum paper to a sheet of glass which was fixed to a Mag. window with a north exposure.

To summarize, I can say that alizarin and its derivatives and galloflavine form remarkably durable, lakes; that some eosine lakes, naphthalene, scarlet, and erythrene come next; that after these comes crim-ficiently elevated to allow a person lying upon the son lake; that next to crimson lake comes acid green, track to escape contact with it. That as there is usuwhile among the very fugitive colors we must place ally several feet from forward wheels to front end of methylene blues, methyl violets, brilliant green, and | car, the driver would have six or seven feet additional ferred to another machine, where it is clamped tight, some eosine lakes.

not necessarily fade rapidly. This is probably the worst front of wheels carried very close to track and employ steel, then one of wrought iron or soft steel, and so on fault a color can possibly have.

 $inference\ from\ the\ behavior\ of\ a\ particular \ dye\ when\ _{|} fender\ clear\ the\ ground. \ \ The\ writer\ also\ says:$ used in one way as to how it would behave when used in another. For instance, eosine, when dyed upon vice would be, first, and principally, a smooth surface wool or cotton, was one of the most fugitive of the road, a car body sufficiently elevated, and a wheel of them is only long enough to reachthrough two aniline colors, yet if it were precipitated on baryta | guard attached rigidly to and in front of and entirely | plates, and the screws which join the third, fourth and or lead bases in the proper manner, it was one of the around the trucks, reaching within one and a half fifth plates to the first are never directly under any most permanent. As a manufacturer of dyes, he was inches of the ground, allowing that space for the oscil- other screws, so that there is no chance for a burglar interested in their permanence when applied to fabrics lation of the car truck. This means a complete inclost to bore down through a row of screws. The plates are or yarns. He had come to the conclusion that no law | ure of the wheel system, and, with a life-saving guard also drawn very close together, for if any space was could be laid down that a particular color was fugitive at the forward end of the truck running freely over a left between them, a safeblower might succeed in getor non-fugitive sui generis. All experiments showed uniform roadbed, would positively discount liability ting his dynamite into it. this to be absolutely impossible. The permanence of of accident." a color was a function of the color itself plus the substance with which it was combined. That was shown fender that will "fend" is one of the things that is other ingredients, usually according to a secret reby the behavior of colors of the methyl violet, brilliant surely coming, where it has not already been introduc- ceipt, is packed solidly. In case of fire the theory is green, and malachite green series when dyed upon | ed, and managers must study the question carefully, that the water in the cement-about 43 per cent-will, starch. The speaker instanced some tubes of starch as they will soon have to face it, either of their own owing to the heat of the outside covering, become dyed with one per cent of methyl violet and brilliant free will or by ordinance. The elevation of the car steam, partially, at least, and be driven close to the green. These tubes were prepared about ten years body, however, would doubtless be generally consider- inner wall. Here it will remain and furnish a ago, and after being shown for months in an exhibi- ed a great objection, making entry and exit slower and blanket impervious to heat. All the bolts are cyltion in East London, had been exposed to sun and more difficult, while the steps would still hang as low indrical and from an inch up to two inches in dialight for years, but were still absolutely unchanged. as the generality of car bodies at present. Had wool or cotton been used, the color would have disappeared in a few months. To obtain reliable results, Mr. Laurie should obtain colors the genuineness of which could be certified, and should himself Hyslop gives the following explicit instructions, by fol-shaft which runs through the safe door and connects prepare the lakes to be experimented with. He would caution the author against being misled upon one point. If he dyed two parts of color upon 50 grammes of barium sulphate and then mixed it with another 50 grammes of barium sulphate undyed, and compared the two might, owing to the imperfection of human, shorter exposure than given for wet collodion. vision, appear to have the same tint. But as a matter of fact he would have double the amount of color unthe spectrum of the colors. The slowness of some and have it in a deep tray.

with sulphide of potash, showed no longer any black; than by this method.

In the precipitate, Dr. Stiebel found: 0.2715 gr. of silver=98.84 per cent of the quantity calculated; calculated, that is to say, practically the entire quanthe other hand, the gold and silver obtained, especially

Car Fenders.

A writer in a New York daily, in solving the fender problem, sets forth that the car body should be sufspace in which to stop the car before the wheels reach-In some cases colors quickly change in tint, but do ed the fallen person. He would place a guard close in Mr. R. J. Friswell said it was impossible to draw an smooth surface necessary to make the low-running

A Simple Photo-engraving Method.

In the March issue of the Inland Printer Mr. W. H. blocks.

is, those coated on celluloid—and expose behind a rection, the arm slips into them and the bolts can be this with another 100 grammes dyed with two per cent, ruled screen in the usual way, giving, of course, a much | thrown. But if the slit in a single one of the tumb-

sent out by the plate makers, and fix in hypo-soda, tance apart, and small screws with big heads are dergoing the action of light in the one case, just as a Wash thoroughly, and while this is proceeding make fastened at random over them. As these strike todouble depth of solution gave double absorption in up a very hot and saturated solution of chrome alum, gether in turning, the tumblers whirl, and a man

colors to fade might be accounted for by their pro- When the washing is completed, plunge the negative once getting the slits in all the tumblers together. But

The Durability of Pigments Derived from Coal gained all its limpidity, the filtered solution, treated impossible that cuts can ever be made at a less price

Scientific Safe Making-Manufacture of Burglar Proof Sates.

The latest burglar proof safes and vaults are magnificent specimens of skillful workmanship. Although the doors often weigh tons, they swing as easily on their hinges as a window shutter. After the first great potash process are twofold. First the gold and the door is thrown back and displays its glittering array of which was kept in a corked bottle, and then laying on silver are obtained by a single operation, then the so bright locks, its glass incased clocks and its smooth a wash with a soft camel hair brush, I should get a lution of liver of sulphur is avoided, pernicious as well steel bolts, there is another door almost as strong, with tint of the depth required. These washes of color for the sense of smell as for the products kept in the bolts and locks of its own. When this is open, it reveals three other doors. The upper two are of thin steel and have no locks. Only papers and books are to be kept in the little pockets or pigeon holes which they inclose.

> only use a very weak acid solution, and to carefully kin seed does to the pumpkin. And it is not only iburglar proof, but fire proof-warranted, in fact, to To those who might make the objection that the stand for at least seventy-five hours the greatest The making of a safe of this kind is a complicated which might give rise to arsenical hydrogen, the author and expensive operation, in the opinion of the Chicago advises operating in the open air or in a laboratory Record. All the steel used comes in the form of plates from the works. After having the necessary screwholes bored in them they are heated to a high temperature and then tempered by suddenly immersing them in water. When they come out they are often a little twisted and warped and have to be rolled cold and sometimes polished clean by a swiftly moving emery wheel. The noise of this operation is ear-splitting and so rasping that a man with ordinary nerves can hardly endure it. When the plate is perfectly level it is transand an emery wheel shaves off the edges.

> The plates are now put together, first one of hard Belgian block or asphalt in order to secure the true, until the necessary thickness is obtained. From the iron the safe receives its tenacious qualities-it cannot be cracked or broken as easily as steel-and the steel "An ideal condition of roadbed, car and safety de- imparts a hardness that defies the burglar's drill. The screws are also made of combined steel and iron. Each

> Between the interior and exterior walls of the safe a The Street Railway Review remarks: Certainly a large amount of hydraulic cement, combined with meter. Combination locks are now used exclusively. The mechanism of most of them is extremely simple. In one lock there are a number of round brass disks or "tumblers," each pivoted at the center on a small lowing which he claims that any one familiar with dry' with the lock knob. Each tumbler has a slit in it just plate photography may produce half-tone printing the size of the steel arm which controls the bolts and reaching nearly back to the center. When all these Take any of the slower brands of gelatine films-that slits are together and pointing in exactly the same dilers is even a thousandth of an inch out of line, the Develop the plate with the usual pyro-soda formulæ arm will not slip back. The disks are set a short dismight turn the lock knob a thousand years without

ducing dark-colored decomposition products on the into the hot alum solution and keep it there for five or the man who knows just how far to turn one way and surface, which had a protective action on the color ten minutes, when it will swell where it has not been then how far back again according to the combination exposed to the light and remain sunken where it has numbers has no trouble at all. beneath. The combination and numbers are easily changed by

been exposed.

Powdered Zinc for Recovering Photo, Wastes,

From this solution the plate is taken and washed; it changing the screws in the disk. Many of the best Dr. Stiebel, of Frankfort, uses zinc in powder to get is then placed in a strong solution of chloride of safes and vaults are now being provided with time back the gold from toning baths. This agent renders aluminum for ten minutes, then washed again and locks. Two and sometimes three clocks are inclosed in glass cases just inside the safe door. When the excellent service for precipitating neutral or alkaline dried over the stove.

solutions, even when they have a slightly acid reaction. When dry it is ready for mounting on the block or door is locked, no one can open it again until the The excess of acid is better neutralized by the addi for electrotyping. If a small edition of prints is re-pclock hands have traveled the set distance around the tion of alkali, otherwise it would be necessary to quired, an electrotype is unnecessary, because the dial, and touched a little trigger which releases the greatly increase the quantity of zinc powder necessary film is already as hard and as difficult to injure as a bolts. More than one clock is used, so that if one runs to weaken this acid, which is not the case when the copper block. It only remains, therefore, in this case down the others will go on and perform their duty. In solution is neutral or alkaline. Dr. Stiebel took for to mount the film on a type-high block with celluloid the big banks the vaults are closed about five o'clock his experiments a solution of hyposulphite of soda of cement, as used for celluloid electrotypes, and it will in the evening and set to open a little before nine 1:5, which contained exactly per liter 1:0988 gr. of stand all the impressions desired. Where a large o'clock in the morning. It is a general impression silver and 0.4648 gr. of gold; 250 cubic centimeters edition is desired the film may be sent to the electro-that an expert burglar can open a combination lock of this solution were treated with 2.5 gr. of zinc typers and manipulated in the usual way. by listening to the clicking sounds, but dealers say it powder, which had previously been strongly agitated | There is no doubt, concludes Mr. Hyslop, but that is not possible for any one to do it. If a safe owner in pure water. The mixture was stirred with care. this is the process of the future, being quicker, simpler, forgets his combination, the safe has to be bored into At the end of ten minutes, when the liquid had re- and cheaper than present methods; indeed, it seems -there is no other way of opening it.

THE PRENTISS ELECTRIC SYNCHRONIZER.

We illustrate herewith a system of regulating and synchronizing timepieces, which has been patented by Mr. Henry S. Prentiss, of The Prentiss Clock Improvement Company, of 49 Dey Street, New York.

A number of clocks are arranged in a single system, adapted to close the circuit at a predeter mined period before the hour, and break it at the hour.

In the synchronizer system all the secondary clocks are regulated to run a trifle fast. say from one-tenth to three seconds per hour, and the circuit is closed at the master clock for ten seconds, or other predetermined period before the hour, to vitalize the magnets of the secondary clocks, the latter being held up just before the synchronizing period and then released exactly on the hour, while "slow" clocks are set up sufficiently to make them correspond with the master clock. The small figures show how this is effected by connection with an electro-magnet secured to the frame of the secondary clock and adapted to control a detent lever engaging a toothed disk on the arbor of the scape wheel, the lever being normally held out of engagement with the wheel by a spring. The minute hand of every clock on the line is thus at all times under control. If any of the secondary clocks stop, they can be set without taking special care in setting them to the exact time, since they

are regulated to run fast, and therefore will ultimately be brought to correct time. This synchronizer may be applied to any clock. The company also sell the calendar and equalizer described in last week's issue in localities outside of New York City.

THE PROPOSED RAILWAY UP THE JUNGFRAU. About fifty years ago, says the Graphic, London, when France, England and America were already covered with a network of railways, George Stephenson was invited to go to Switzerland and give the benefit of his experience in the matter of the construction of railways in a country so much cut up by mountains and rivers. Several companies then set about constructing lines of railways in places which lent themselves the more easily to such enterprise, but it was never contemplated then that a day would come when interior of the heights of the Eiger, Monch and Jungeven the most insurmountable obstacles would be con- | frau, at the summit of which it emerges into daylight by quered, when the highest points would be, as it were,

structed in the mountains of Switzerland-funicular railways and others of that now familiar type which The lift in the center of the cone of the Jungfrau has ascend heights by means of cogwheels gripping a to rise 216 feet. With the exception of the station at utilized steam or hydraulic power. The railway up the number of six, are bored in the solid rock. The exits with the master clock provided with a circuit closer | Righi, with its interlocking wheels, sufficiently demon- communicate with pathways, by means of which travel-



THE PRENTISS ELECTRIC SYNCHRONIZER.

strated the superiority of this system, whether regarded from a practical point of view or in the light of such a purely personal point of view as safety, but a disadvantage has always been the smoke and dirt, and the weight of the coal and water which the engines are compelled to carry. But science now makes such rapid strides that it could not in any case have been long before a satisfactory alternative was available, and this is now found in electricity, developed either by steam or hydraulic power, and readily conveyed to any convenient distance. One of the first electrical mountain railways was constructed on Mount Saleve in Geneva. It is this railway which serves as a model for the bold project shown in the engraving.

The concession for constructing a railway of this description, starting from Scheidogg and traversing the means of a lift, was granted by the Swiss government, stormed and carried, and the deepest chasms bridged. after long debate, at the end of last year. The rail-said to be safe and artistic.

Since then many climbing railways have been con- way is more than eight miles long, and rises to a height of 6,890 feet, the gradient varying from 1 to 26 per cent. center rail, but all uniform in one respect, in that they the point of departure, all the other stations, to the

> ersalighting can finish the ascent of the peaks on foot. These stations are complete with every luxury possible, containing dining rooms and miniature bed rooms, like cabins on American liners. The lift to the summit of the Jungfrau consists of an enormous tube fitted into the vertical hole sunk in the rock. Within this iron tube the cage ascends and descends, worked by a dynamo, which in turn derives its power from a hydraulic motor utilizing the waters of Lake Luchinen in the Lauterbrunnen. Within the tube is a winding staircase, so that travelers not caring to use the lift may reach the summit of the mountain on foot. The tunnels, galleries, restaurants and lift are all lighted with the electric light, and it is even anticipated that the carriages may be warmed by the same means. It is scarcely necessary to say that the stations are all in communication by telegraph and telephone with the world below. Our illustrations are from drawings by G. Wassermann, engineer, of Bale.

441 A Novelty in Lantern Entertainments.

A novelty in the way of lantern or stereopticon entertainment has lately been brought out by Mr. Alexander Black, of Brooklyn, who has written and illustrated a picture play called "Miss Jerry."

The story, which is very sprightly and pleasing, is told as the views representing the exact scenes appear on the screen. While the story is being told, the changes in the pictures are so natural that the figures almost appear to move. Among the scenes are many out-door views in New York, many interiors, and real persons; one of the remarkable pictures is an interview of Miss Jerry with Mr. Chauncey Depew. One of the scenes shows Miss Jerry on the Brooklyn Bridge conversing with Superintendent Martin. Another view shows Fifth Avenue by moonlight.

The entire entertainment is of a very pleasing character and reflects great credit on Mr. Black.

In Australia horses and cattle are now being branded by electricity from storage batteries. The brand is





One of the cars is here shown entering a tunnel. There is a footpath by the side of the railway In the upper portion of the picture is shown a station overlooking one of the glaciers.

VIEW OF THE RAILWAT NEAR THE SUMMIT OF THE JUNGFRAU, SHOWING PATH FOR PEDESTRIANS.

The drawing shows the terminus of the railway, with the restaurant attached. Passengers who dislike the lift may walk np the circular footway which winds round the interior of the shaft.

SECTIONAL VIEW OF THE LIFT IN THE INTERIOR OF THE JUNGFRAU CONE.

THE PROPOSED RAILWAY UP THE JUNGFRAU.

substituted, thus rendering it a closed omnibus. A

rail on the top permits of the carrying of baggage.

The consumption of water is from three to four gallons

mountainous districts. The consumption of coal also

PORTABLE SAND BLAST APPARATUS

The uses of the sand blast for ornamenting glass, metals, stone, and other materials is well known. A new application of the process for cleaning down the walls of buildings has been introduced in England, which is described in a recent number of Engineering,

been used fo cleaning th fronts of larg public building hotels, etc. Upo a truck is mount ed an oil engin which drives a air compressonwhich fills an ai reservoir to th desired degree o pressure. A flex ble pipe conduct the air to th point desired, an blows the sand a required. Build ing fronts are thu cleaned in a ver expeditious mar ner.

PROFESSOR E E. ARMSTRON in a recent lectur at the Royal II stitution, on "Th Chemical Const tution of th Sugars," said tha Australians e a more sugar pe head of popula tion than an other people i world the Messrs. Cross and Bevan exhibited in the library

some specimens of crystallized glycerine. One crystal ditions of the competition, as at Gaillon one of the Field some glycerine in a more fluid state than itself contained in a glass bottle.

THE SCOTTE STEAM CARRIAGE.

carriages held last year in Paris, the Petit Journal took the initiative. This journal has for a long time advocated the development of open air exercises. In our SUP-PLEMENT, No. 979, we illustrated many of the automobile carriages which took part in the race. The steam carriage of M. Scotte, of Epernay, obtained a prize of 500 francs. In this vehicle, which is adapted for eight persons, the boiler is of the vertical type of the Field system and registered 120 pounds to the square inch. The two cylinder motor makes about 300 to 500 revolutions per minute and develops 5 horse power. The power is trans mitted to the (rear) driving wheels through an endless chain



PORTABLE SAND BLAST APPARATUS

and slightly injured the driver. The judges, nevertheencouragement, so a prize was awarded to it. With-

should be shown in connection with the branches. In of glycerine, about 1½ inches long, had a hole bored tubes inside the vertical boiler burst and there was an drying, it is well to turn part of the leaves wrong side through it, by means of which it was suspended in explosion which caused some damage to the vehicle up, thus showing the appearance of both sides of the leaf; this is especially desirable in the fern family, if less, decided that the carriage of M. Scotte merited only one frond is shown. It is better to mount two or more leaves, and in that way give the different views. out as yet realizing the dream of the tourist or the Never mount more than one species on a sheet; varia-In the organization of the competition of automobile commercial traveler, the belief is now current in France tions of the same species may be placed together, as



herbaceous specimens the entire plant is easily preserved. Bulbous roots may be managed with very little trouble by sectioning the root when too bulky. Succulent plants should be immersed in boiling water before being placed in the press. Each sheet should show specimens of both flower and fruit if possible. In the case of herbs, this can usually be done with one and the s a m e specimen. When the seasons of flowering and fruiting are separated by some weeks, leaves should be preserved with each specimen, as the foliage often changes materially in appearance during that time. Where it is impossible to show the entire plant on a single sheet, the root and leaves

How to Mount Botanical Specimens,

The secret of obtaining fine specimens lies in drying them before decomposition has had time to take place, a mile on a level stretch and from sixteen to twenty in and applying as much weight as possible without injuring the more delicate portions of the plant. The specivaries from six to ten pounds, according to the road mens should remain in the press till all moisture is ab-



THE SCOTTE STEAM OMNIBUS

and a differential gearing. The carriage is 15 feet in that the automobile carriage has come to stay. The that the satellites of the inner edge of the ring move length, 6 in width, and weighs, when empty, 3,700 mechanism is being improved and simplified, and we more rapidly than these of the outer edge. The motion pounds. With 660 pounds of water, 440 pounds of coal, may soon hope to find them coming into more general of the different parts of the ring, in miles per second. seven passengers and the engine driver the total weight use.

reaches 5,940 pounds.

THE chance of two finger-prints being alike is not 1 The carriage has the form of a brake, provided with a top and with curtains, for which windows may be in 64,000,000,000.

small bodies, and can only be given after the photographs have been accurately measured under a microscope. In a few days Prof. Keeler will give accurately the rate of speed at which the different parts of the ring revolve.

by the use of the double sheet balances that lost.-American Gardening.

Saturn's Rings. Prof. James E. Keeler has made the interesting discovery that the ring of Saturn is made up of many The Cost of Power at Niagara.

The company which has undertaken to develop electricity, at Niagara, on a large scale, for manufacturing and other purposes, has acquired more real allows a safe margin and there is very little chance of furnish sites to such of its customers as wish to establish their business close to the source of their mechanical power supply. But the public has been led a lever at one end of the car which operates bell Department building. to expect that, in addition to serving local interests, the company would also furnish electricity to places scores, if not hundreds, of miles away, and there has been much speculation as to the feasibility of carrying such plans into effect. Owing to her proximity to the ing. On the Brooklyn Bridge the lighting trolley or The only process now worked on the commercial scale Falls and her great size and industrial activity, Buffalo roller is tripped and reversed automatically in the is that of Chardonnet, whose first patent was taken has been regarded as the first center of population, stations while the cars are being switched, by means out in 1885, although the method was not generally removed from Niagara, to be provided for. It is not of a rigid frame. The cars are all connected by wires, known until the Paris Exhibition of 1889. According yet quite clear whether that city feels that it is enjoy so that if the trolleys on all the cars but one should to this first patent, cotton is treated with nitric and ing a privilege or conferring a favor in letting the get out of order, that one would be sufficient to light sulphuric acids, and the nitrocellulose obtained is dis-Power Company invade its precincts. Perhaps she the train. When the cars are being switched this sys- solved in a mixture of ether and alcohol, with the adhas not determined that point herself. The matter is evidently still under consideration. In reply to some inquiries from representative Buffalonians, the Power places to allow for the expansion and contraction pressed through a system of fine capillary tubes, whose Company recently offered the following terms: It caused by changes of temperature. Great care is would let the municipality or a private corporation taken to maintain an even tension on the line. come to Niagara, take water from the Power Company's canals at the rate of \$10 a horse power and manufacture its own electricity; or it would furnish was the subject of considerable comment. The resipower off the turbine shafts at \$13, or electricity at the power house at \$18. But if the Power Company undertook to do anything of this sort, it would not con- which each car is equipped, and are now asking why is substituted the cheaper wood cellulose. The nitrotract to deliver less than 10,000 horse power; hence, the same system cannot be applied to the extensive cellulose, after its solution in ether and alcohol, is de-Buffalo must agree to take, at least, that much or elevated railroad systems of both cities. The subject initrated with acetic and sulphuric acids, and its exnone at all. The Niagara people would not accept a of lighting cars in cities is now receiving great attenfranchise to operate a line to and in Buffalo for a tion, and the results obtained on the Brooklyn Bridge shorter time than that for which its own bonds have and on the Broadway and Third Avenue cable roads, resemble that of Chardonnet. De Vivier dissolves been issued. No price is given for electricity delivered \mid which are lighted with gas, show that both gas and at a central station in the suburbs of that city, fifteen electricity are admirably adapted to city car lighting, miles from the Falls, so that the company's own esti- without reference to the motive power employed. mate of the probable waste and cost of transmission is still withheld. There would be four kinds of losses: (1) In transforming at the power house up to a high voltage, (2) on the line, (3) in transforming down at Buffalo, and (4) in distribution over street lines to contwenty or thirty per cent altogether, and they might, perhaps, reach fifty or sixty percent. But if, for example, they amounted to just one-half, the \$18 rate at the generator shaft would mean \$36 to the consumer, without adding anything either for interest on the cost of the transmission plant or for operating expenses. This, however, is probably an extravagant estimate. The prices actually given, by the way, are dressed, and he was then taken to the Emergency Hosfor a twenty-four hour daily supply. Some establish- pital. ments require power, however, for only ten or eleven hours. Whether it would pay to put in storage what the trouble was, was also caught in the flames, batteries to utilize the surplus is a question which and received painful burns. Miss Nevius, in charge of sorbed in two hours 16 per cent of moisture; the legal their managers must naturally consider. Richard the telephone lines in the building, whose office is in amount for natural silk is 11 per cent. The specific Hammond writes to the Buffalo Courier to say that the adjoining room, was overcome by smoke and faintsteam power, on a scale of 1,000 horse power, for ten ed, but was carried out uninjured by one of the emhours daily, can be generated in Buffalo, where coal is ployes. The room was filled with chemicals and exvery cheap, for \$21 per horse power. The Power Com- plosives, which burned fiercely and emitted vast volpany, however, denies this, and estimates the cost at unes of smoke, which caused a hasty stampede of the \$32, besides quoting various experts as estimating the clerks employed in other portions of the building. cost on a twenty-four hour basis at between \$45 and \$60. In some other cities, where coal is more expensive, it is said to be from \$60 to \$75. If, after this dis- the explosives flew all about the room. Besides Mr. cussion. Buffalo decided neither to buy on the terms, Flint, the chief, there were present at the time of the offered nor to let the Power Company bring in its own explosion, Assistant Photographer Theilkill, J. B. lines and supply the market, more distant cities may Wheat, Jr., J. E. Latimer, and Mr. Blackage, assistpossibly be deterred by her example from patronizing ants. Mr. Theilkill's story of the occurrence was that the Niagara concern; but as the latter supplies its | while Mr. Flint was pouring about five gallons of ether local customers with electricity at \$20 per horse power, into a bottle the bottle fell to the slate floor and broke, in large quantities, there may be a greater industrial the contents running along the place. He began sweep development at the Falls than would otherwise result. --N. Y. Tribune.

The Lighting of the Brooklyn Bridge Cars.

The lighting of the cars of a cable road by electricity ing up about seventy five bottles. Mr. Flint was that appeals purely to business men. The social and is a novelty and requires the use of some special apparatus. In the main, the plan adopted on the Brooklyn Bridge resembles the now familiar trolley system. A a blaze, and rushed for the area, calling for help. bare copper wire is suspended from poles and from the J. B. Wheat, Jr., was standing near Mr. Flint, and framework of the bridge. This wire is carefully insu- was also blown through the door, his hair ablaze and to be disregarded. lated, the return is made through the rails in the usual clothing torn. He received no permanent injuries way. The current is supplied from the power house in and attended to Mr. Flint. J. E. Latimer was blown foreign parentage, the persons of foreign birth sup-Brooklyn. It is led to the center of the bridge through through the open window onto the lawn, and was fola feeding cable, which there divides into two branches, lowed through the adjoining window by Mr. Blackage, one leading to each of the towers and there connecting who was in the dark room at the time. with the overhead wire. The overhead wires are in turn connected together at intervals of 500 feet. The explosion. He was blown through the window by the height of the wire above the car was regulated by the second. His escape from injuries was a miracle. His framework which extends over the three suspension apron was on fire, his head singed, his hat blown into spans. The distance that this framework clears the fragments, and his coat torn in many places. car only allowed the wire to be suspended nine inches above the roof of the car. At first it was thought gallons of ether, and 100 pounds of gun cotton Of that a regular trolley with a short pole could be used, course these and everything else in the room were totalbut the rocking and swaying of the cars was so great ly destroyed. in proportion to the distance of the car from the wire After half an hour's hard work the firemen extin-

arms, with which the roller forms a triangle, the apex were stored a number of files which contained records of the roller is really greater than is necessary, but it these were damaged by water. cranks and a connecting rod, which raises the roller into contact with the wire.

It has been found advantageous to have the roller trail, no matter in which direction the car may be go-

The former plan of lighting the cars was the kerosene lamp system, and the poorness of the illumination fine light given by the twelve incandescent lights with

Another Fire in the Patent Office.

this room, was pouring ether into five gallon jugs, ness gave the following results: when some was spilled, and, running down the floor, came in contact with the stove and ignited. Mr. Flint was caught in the flames and severely burned about the face, arms, and shoulders. He was removed to a drug store across the street, where his wounds were

Watchman Parkins, who ran into the room to see

The photographers and assistants had many narrow escapes for their lives, and nearly all were on fire, as ing it toward the door, remarking to those about to be careful with the lamps, etc. Some of the fluid reached the stove and there was an explosion, which was quickly followed by a second with considerable force, blowblown through the door, his head striking a mass of papers piled in the hallway. He arose, his clothing in

being attached to the hinge and spring. The length of the office and other papers, and a great number of

The Patent Office has twice previously been on fire. estate there than it needs for its own use, in order to it ever jumping the wire. In the day time the roller In 1877 a fire occurred there which burned for twenty is lowered to avoid unnecessary friction. When the hours and totally destroyed the museum, necessitating lamps are to be lighted the trainman of each car pulls the entire reconstruction of that portion of the Interior

Artificial Silk,

Patents for the production of artificial silk have been granted to Chardonnet, De Vivier, and Lehner. tem prevents the flickering of the lights. As in the dition of a small amount (0.2 per cent) of some metallic bridge itself, there is a slip or expansion joint in three salt to lessen the danger of explosion. The solution is openings have the diameter of a natural silk fiber, into hot water, in which the ether and alcohol evaporate.

leaving a fine thread capable of being spun. It possesses, however, great inflammability.

A company with a capital of 6,000,000 frances was dents of New York and Brooklyn are pleased with the formed at Besancon to work Chardonnet's process, in which several improvements were made. For cotton plosiveness thus removed.

> The processes of De Vivier and of Lehner very closely nitrocellulose in glacial acetic acid, with the addition of solutions of fish glue in glacial acetic acid, and guttapercha in CS₂. Lehner dissolves a mixture of silk waste and nitrocellulose in ether and alcohol.

Chardonnet's artificial silk appears in commerce as The United States Patent Office was for the third a grayish-white, lustrous fiber, similar in appearance time visited by fire at about 1:15 P. M., April 22. The to boiled-off natural silk. It lacks the softness and the scene of the blaze was in the southwest corner of the peculiar crackling feel of "boiled off" silk. In tenacity sumers. These could not well amount to less than basement, in the photographic blue print room, close and elasticity it compares unfavorably with the natuto a crowded public thorough fare. Mr. Flint, chief of ral product. Experiments with fibers of similar thick-

· · · · · · · · · · · · · · · · · · ·		· · · ·
1	Strength (Tenacity),	Elasticity (Amount of stretch).
Natural silk Artificial silk	Grms. 214 69	Mm. Meter. 189 in 1 155 in 1

In a room of average dryness, dry artificial silk abgravity of artificial is about 13 per cent higher than that of natural silk.

In dyeing properties the difference is very marked. On soaking with water the artificial silk fiber becomes very weak and must be handled with the greatest care. Soap solutions do not greatly injure the fiber, but free alakalies bring about an alteration which in concentrated alkaline liquids extends to complete solution of the fiber. Dilute acids are without injurious effect.

Dyeing is accomplished without addition of soap or acid to the bath, so that the number of dyestuffs applicable is somewhat limited; the most suitable are the basic dyes, with a few "direct cotton" coloring matters. Various shades may be obtained.

There is no doubt that artificial silk can be produced more cheaply than natural silk, and can replace it in many branches of the silk industry.

What Immigration Costs.

There is one aspect of the immigration question moral influences on the American people of the unrestrained horde of Europeans pouring upon our shores are, of course, the most important, but the heavy tax in money thus levied upon the American people is not

Mr. Theilkill was blown across the room by the first

Stored in the room were 18 gallons of collodion, 200

that it had to be abandoned. Springs were used to guished the flames before they could spread to the allow the trolley a certain amount of play, but this adjoining offices. The loss was about \$1,500, princiwas not enough to keep the wheel on the wire. A pally in photographic apparatus. Most of the original bonds, and criminals, the figures would be even more roller was then substituted for the wheel. This roller drawings were saved, and of those destroyed a good startling, but unfortunately the figures on parentage is made eighteen inches long and is mounted in two many can be replaced. Along the halls in the vicinity are defective.-Commercial Bulletin,

According to the last census, in addition to those of ported at the public charge of the people of the United States were divided as follows:

Insane	
Criminal	
Pauper	
Total	

The average annual cost of a pauper, a lunatic or a prisoner in the conservative and economically managed public institutions of Massachusetts is one hundred and fifty dollars.

The annual cost, then, of maintaining this standing army of foreign born vagabonds is not less than \$11.832.000.

If to this could be added the expense of maintaining the American born children of foreign paupers, vaga-

Correspondence.

Frozen Soap Bubbles. To the Editor of the SCIENTIFIC AMERICAN:

Having noticed your item about soap bubbles in vour last issue. I will cite a curious thing that happened here last winter when the thermometer stood about 14 degrees below zero Fah. One of my children, a little boy, was "blowing soap bubbles," and suggested that he try what the cold weather would do to them. I consented, and, after blowing one, sent it adrift in the usual way, when it froze instantly and fell on to the snow a frozen hollow sphere of ice. It was tried several times with the same result. A curious fact, also, was brought out, that when the thermometer rose to 0° , no frozen spheres could be made, whether from change of temperature or change of air I could not ascertain. I would like to know if this can be accomplished at a lower altitude, where the air is WILLIAM PIM. not so dry as it is here.

Denver, Col.

Curious Electric Discharge.

To the Editor of the SCIENTIFIC AMERICAN:

I am making asphalt pipe. The process is as follows: Crude asphaltum and gravel, equal parts by measure, are each heated in separate kettles to 400° F., then both are mixed together and filled into sheet iron moulds. The space between the moulds is maintained held to that ring by inside and outside wrought iron rings. After the moulds are cooled off, which takes time according to the size of the pipe, from two to wrought iron rings have been removed and the moulds moulds spring off there can at times be seen large higher court. sparks between the sheet iron and the pipe. By havgether. Men working for me have experienced the same.

The object of this letter is to find out if you or any why it discharges just at the moment the moulds are taken off. GUS. SCHADE.

Anaheim, Cal.

[The description suggests that a condenser is formed by the combination, which is discharged on opening the mould. Whence the charge is derived is not clear.—ED.]

The Timber Boom.

Both in a saving of time and timber, the "boom" is a vast improvement over the raft. In the first place, in expense in caring for the logs is considerable. A lumberman's description of a boom is as follows :

" In simple language, a boom is nothing more than a called, who stated that he was supplied with the water for cattle or boiler use. The bulkheads are so plaintiff's photographs to work from, and he copied arranged that any two compartments, and in some floating pen, in which the logs are corraled as they drift down stream. It may extend along the banks of them as near as he could. In the end, Mr. Justice cases more, may be bilged and the vessel still keep the creek or river for one, two, three or even five miles, Stirling reserved judgment in the suit. afloat. The entire vessel, including all the holds, Arising out of this case were two others that are of 'tween decks, engine and boiler spaces, and cabins, is and is divided into pockets or sections of whatever length may suit the conditions under which the boom greater direct interest to photographers, particularly lighted by electricity on the double-wire system, generis constructed. At the head of each pocket there is an now that they are beginning to stand up for their ated by two compound-wound self regulating dynamos opening, and extending obliquely across the river, from rights against the illustrated press, and indeed to the situated in the engine room. At each of the seven the head of each pocket to the opposite shore, is what is holders of copyright generally. When the Empire hatches there is a cluster of 16 lamps of 16 candle known as the 'sheer,' a floating line of logs chained first produced the "living pictures," the Daily Graphic, power. The two sets of triple expansion engines have together, that serves to swerve the saw log from its and the Westminster Budget reproduced some of the cylinders 221/2 in., 361/2 in., and 60 in. in diameter by 48 course in midstream at such an angle that it will go tableaux, whereupon Herr Hanfstaengl proceeded in. stroke, and two large double-ended boilers fitted directly toward the opening in the pocket of the boom against both papers for infringement of copyright— with Howden's forced draught. There is a large on the other side of the river. These sheers extend from seeking an injunction. The case against the Daily auxiliary boiler for winches, electric lights, etc. The every opening in the boom. It will be seen, then, that Graphic was dealt with some time ago, when Mr. propellers have bronze blades, and the shafting is of the boom, when rigged out for business, becomes a Justice Stirling decided in favor of the plaintiff, as Vicker's steel. The vessel was tried both on the measseries of funnels and pens with which to catch and might have been surmised from the ruling in the Chat, ured mile and between the lights, and proved in every hold the logs, but it requires a good deal of expert terton case just referred to. Against this judgment way satisfactory-a speed of 1534 knots being obtained manipulation to 'save the crop' when the tide is run- the defendants took the case to the Court of Appeal, between the lights. high and flowing fast." and that court reversed the judgment of the court Cheaper as the boom system is than the rafting, the below. Then the plaintiff appealed to the House of The New Mail Bicycle. cost seems a big item when put into figures. The con-Lords, and here the ruling of the Court of Appeal was The New Mail bicycle is an honored name. It exstruction of pockets, etc., for a two and one-half mile affirmed. Their lordships said that, looking at the tends back to the days of the "good old ordinary," as boom, in Breathitt County, for instance, came to eight variations between the originals and the rough the high wheel of early days came to be affectionately thousand dollars recently. Near the pocket ends of sketches, the latter were not, in fact, copies, reproduce termed by its old-time devotees. Now that the high the shears and at the openings in the booms, platforms, tions, or colorable imitations of the original pictures wheel is extinct, the name continues and is applied to are built on which the "sorters" are stationed, men or the design thereof, and did not constitute an in a representative high grade safety of the most adwho, with pike poles, pull in the logs as they float by. fringement within the Copyright Act. vanced lines of construction. It is a twenty-three The suit against the Westminster Budget was very pound wheel, with high frame and large tubing, thus The work is sometimes fast and furious, as when logs are going by at the rate of from fifty to ninety a similar to that of the Daily Graphic, except that the embodying the two leading points of 1895 construction. minute. Sometimes the men are obliged to work for sketches were more complete and elaborate in the It is constructed by William Read & Sons, 107 Washtwo or three days and nights at a time, only the ex-details, and was, for convenience, proceeded with ington Street. Boston, Mass. The adjustable handle citement of the work sustaining them. Their food simultaneously with that of the Empire. Two R. A.'s, bars and detachable sprocket of original design are during such an ordeal is taken by "jerks and snatches," Mr. Alma Tadema and Mr. Marcus Stone, who were other characteristic features. The seat rod is also new and lucky is the "sorter" who is excused for a cat nap. also witnesses in the Empire suit, testified that the in plan and is found to be an acceptable improvement. At night the river is lighted by basket torches, and for cuts were decidedly copies of the plaintiff's pictures The wheels have wooden rives, and for tire on the reguwarmth fires are lighted on beds of sand which have and the design thereof. One of the witnesses, after he lar mounts an endless inner tube tire has been chosen, been laid on the platforms. During a recent big run had been shown one of the cuts in the Daily Graphic one which gave great satisfaction in 1894. and which, at Beattyville, on the Kentucky River, one firm alone and expressed his opinion upon it, was asked by the as improved for the present year, should give still counsel for the defense if he would be surprised to greater. The lady's wheel, with loop frame, is made caught eighty thousand logs.-New York Evening learn that the House of Lords had decided that these of identical standard with the man's wheel. Post.

British Copyright Decisions.

case. The case, taken by itself, is of little immediate the Copyright Act. interest to photographers, but there are other cases in of copyright.

During the arguments, at that time, the case of Tur-ner v. Robinson was freely quoted, and it has consider-From the above judgments it would app

ing my hands on the pipe and the moulds I received decided by Mr. Justice Stirling that the tableaux were of copyright, whether photographic or otherwise.sometimes such heavy shocks as to draw my arms to- not an infringement of the plaintiff's copyright, in so British Journal. far as the models were concerned, inasmuch as the Copyright Act of 1864 enacts that the pirated works should be forfeited to the owner of the copyright, and, of your readers can explain how this electricity, for of course, this could not be done with the living fleet, the twin screw steamer Sylvania, recently took such is what I judge it to be, accumulated there, and models, though, in the case of the backgrounds, it place in the Firth of Clyde. Built by the London and , night be different, as the act distinctly mentions, Glasgow Engineering and Iron Shipbuilding Company, piracy of the picture, or "any part thereof." He re-Limited, Govan, the Sylvania is to be engaged in the fused the injunction applied for, on the defendant's cattle and cargo trade between Liverpool, New York, giving an undertaking to keep an account of the num- | and Boston. Although a cargo steamer, the vessel has

crude cuts were not infringements, created some The arguments in a suit that has been before the amusement by replying to the effect that he should Law Courts, and has attracted a good deal of atten- not be at all surprised at any decision of the House of tion, for the last year and more, after occupying the Lords on questions of art. It was contended that the court for several days, were concluded recently. The pictures in the Westminster Budget were better than suit has become known as the "Living Pictures" those in the Daily Graphic, and that they came within

In delivering judgment, Mr. Justice Stirling said connection with it that are of importance to all holders that, in the case of the Daily Graphic, he had thought that the sketches were copies or colorable imitations It will be remembered that somewhere about this of the pictures of the plaintiff. They might be bad time last year the Empire Theater of Varieties pro- copies, or imitations, if you please, still he thought duced a series of tableaux, "Pictures of Living Masters | they were copies; but the Court of Appeal and the Realized," and among the number were several popu- House of Lords thought otherwise. After reading lar ones, in which Herr Franz Hanfstaengl, the well- from the judgments delivered by Lord Lindley and known publisher of Munich, London, and New York, the load chancellor respectively, the learned judge holds the copyright. Soon after their exhibition, that said it became his duty to apply in his court the gentleman, the plaintiff in the several actions, institut-iprinciples that were applied in the Court of Appeal ed an action for an injunction to restrain the exhibi- and in the House of Lords in the case before him, and, tion of his works in that way, and claimed penalties in the result, he gave a verdict for the defendants, and damages for the infringement of his copyright. | with costs. He, however, stayed execution peuding a

From the above judgments it would appear that if, able interest in connection with the two other suits to as in the case of the two journals proceeded against, be referred to presently. That case was this. The the cuts are crude or badly done, there is no infringeplaintiff, Turner, was the holder of a copyright of a ment of copyright. Indeed, on the judge remarking painting, the Death of Chatterton. The defendant, a that the faces were entirely different in the two picphotographer, after seeing the picture, arranged in his tures, and that it was for that reason, among others, studio a garret scene like that depicted in the paint-, that the lord chancellor had pronounced the Daily ing, and introduced a living model in the same pose as Graphic reproductions to be no infringement, Mr. by a cast iron ring on the bottom and the moulds are the Chatterton in the picture. He then took photo- Moulton, Q.C., for the plaintiff, then asked if it was graphs of it, which he afterward published. Pro- contended that you cannot infringe copyright unless ceedings were taken for an infringement of copyright, you are a good artist? His lordship replied that he and it was decided that the photographs, though had no occasion to lay down any proposition of that eight hours, they spring off from the pipe after the taken from solid accessories and a living model, were sort. He was content to take his stand with the words an infringement of the copyright in the original pic- of the highest authority which was provided for his tapped with a hammer. Just at the moment the ture, and that judgment was upheld on appeal to a guidance. The decisions in the two cases referred to clearly tend to render the present Copyright Act still In the Empire case, now to be referred to, it was more unsatisfactory than it was before to the owners

A New Cunard Cattle Steamer.

The trial trip of the latest addition to the Cunard ber of times the backgrounds were used and the rather a fine appearance. The Sylvania is 460 ft. long amount of money received at the doors of the theater; over all, 49 ft. beam, 42 ft. 6 in. deep from shelter deck, where they were until the trial of the action. The and carries 6,500 tons dead weight. The vessel being backgrounds, it may be mentioned, were soon substi- | twin screw, the framing of the after end is carried out tuted by others. Against the judgment of Mr. Justice to meet the stern tubes, and ends in a massive steel Stirling the plaintiff appealed, but the Court of Appeal casting on each side built into the hull. There are upheld the judgment of the court below. The argulnine watertight bulkheads extending to the upper there is no boring of logs and afterward fastening them ments in the trial of action were concluded recently deck, and these are fitted with watertight doors on each together, as in the rafting method, and thousands of and among the witnesses called were some Royal side in the 'tween decks for the handy working of catfeet of fine timber are thus saved. Then the reduction Academicians, who testified that the backgrounds the or cargo. In all there are 24 compartments for were a very important part of the pictures. The water ballast, and part of the double bottom under artist who painted the Empire backgrounds was also engines may be utilized for carrying reserve fresh

Scientific American.

nothing overpowering to the senses, nothing gigantic ness, and perfection of decoration. The exterior of THE NEW YORK HERALD ESTABLISHMENT. The most beautiful printing establishment in the to strain the eye in reaching for high sky lines, noth- the Herald building is a gem of beauty, a crystallized world, architecturally considered, and the most per- ing to weary the mind with enumeration of vertically dream of art. The edifice is a copy, or rather a happy fect in its equipments, regarded from the mechanical piled stones and window sills. From a distance one adaptation by architects McKim, Mead & White, of



THE NEW YORK HERALD BUILDING-GENERAL VIEW

sixth Streets, one of the great foci of business and population in this proud city.

standpoint, is that of the New York Herald, which only sees a quiet two-storied, tile-roofed building. But the celebrated ornate structure known as the Palazzo occupies the costly square formed by the junctions of as one draws nearer, the structure changes into an ob- del Consiglio, which still stands in Verona, Italy, and Broadway, Sixth Avenue, Thirty-fifth and Thirty- ject of varied and surpassing beauty. Sculptured which was built toward the close of the fifteenth cencolumns and graceful arches occupy the four fronts of tury by Fra Giocondo. the edifice, giving support to walls and cornices that Our first page plate is a photographic representation

In the dimensions of the Herald building there is are models of harmonious proportions, elegance, rich-of the beautiful group of statuary which adorns the



THE NEW YORK HERALD ESTABLISHMENT-BUSINESS OFFICES AND GRAND STAIRWAY.

entrance front of the Herald building on 35th Street. admirable works are well known, and some of them The statue of Minerva here appears in the attitude of directing the artisans at her feet to sound the great shown in our group are movable figures, operated by The machinery by which the bell is sounded and the



THE NEW YORK HERALD ESTABLISHMENT-A VIEW IN THE PRESS ROOM.

bell and proclaim the onward march of time. This machinery, and as the time comes around their bodies clock mechanism driven is shown in our plate, just group of statuary is from the chisel of Antonin Jean sway, the hammers move, and the bell sounds the above the clock face. One of the machines operates Carles, the distinguished French sculptor, whose many hour. The bell, however, is not actually struck by the clock, the other works the figures. The connecting



THE NEW YORK HERALD ESTABLISHMENT-A VIEW IN THE COMPOSING ROOM.

Scientific American.

rods can be traced by an examination of the plate. This mechanism is by the Howard Clock Company, of Boston, Mass., and its accurate working gives much satisfaction.

Our next illustration shows a general exterior view of the Herald building as it appears from Herald Square, looking north. The long colonnade fronts on Broadway; the main entrance to the building is on Thirty-fifth Street. The next engraving is an interior view, showing the publication office of the establishment and the grand stairway leading up to the various editorial offices, news offices, reporters' rooms, telegraph and telephone offices, etc.

The decorations of the publication office make it a most attractive apartment. The rim of the counter surrounding the circular edge of the room is surmounted by a brass rail with plate glass set in spacious framework of brass. Rising from the floor at the edge of the counter to the ceiling are hand some marble columns with Corinthian caps and richly ornamented decorations. The ceiling is treated after the style of the Renaissance, and in the most elaborate and finished manner. The floor of this room is set in mosaics of rich pattern, and both at the entrance and at the sides the walls are of marble.

The press room is situated on the Broadway side of the building, occupying about one-half the plot, from a point 66 feet back from the corner of Thirty-fifth Street and reaching to Thirty-sixth Street. It is 149 feet long and 38 feet wide and from floor to ceiling about 30 feet. There is nothing in the building lower than the floor of the press room, which rests at the bottom of the basement. It is also the highest room in the building, filling up the

of the work done by the presses. The latter are set

upon strong, solid foundations and their tops reach about to the level of the street. Those who look on lishment occupies a large portion of the upper floor of through the windows from the arcade see the white the building, a space probably equal to 163 feet in purposes, but great care must be taken, or an explosion rolls of paper as it enters the press and as it comes out length by 100 feet breadth. Here again an old printer may occur which will cause more damage than new printed, filled with news

and folded.

One of our engravings shows the crowds of spectators who at all times fill the press room arcade or corridor when the presses are in operation.

Another plate is a perspective view within the press room corridor, and shows some of the beautiful sculptured columns, arches and pillars of the building.

The view



THE NEW YORK HERALD ESTABLISHMENT-A VIEW ALONG THE PRESS ROOM CORRIDOR.

space of two floors, and it thus enables spectators Besides the above there is machinery for printing in ment is one of the most interesting and notable of all standing on the level of the arcade to see the results colors, which has a capacity of 20,000 eight page Herald the famous objects to be seen and visited in this city. copies per hour.

The type or composing room of the Herald estab-

Look Out for Old Oil Barrels. It may be economy to use old oil barrels for other



would open his eves in astonishment at the changes which a few recent years have made in the type work of a great daily newspaper. Instead of long lines of men standing before inclined cases and laboriously picking up the types, one by one, by hand, we now have rows of type-setting or rather typemaking machines, before which the operators sit and play upon keys like a piano or a typewriter. Each touch makes a letter, which is impressed upon a thin strip of metal, forming what is called a linotype. In the Herald establishment between fifty and sixty of these wonderful machines are used.

Want of space prevents us from illustrating various other interesting departments of the Herald establishment, such as the matrix rooms, where the curved plates are made for use upon printing cylinders of the presses; the art department, where photoengraved plates are produced, every prominent daily paper must now be illustrated with engravings; the steam engine department, which gives life and motion to all the various machinery; the vaults for the receipt and storage of paper, fuel and other supplies.

The Herald building is exclusively devoted to the purposes of the Herald newspaper, of which probably half a million copies are daily printed. Nooffices are rented, no other business is conducted within its domain. Probably the values of property here employed in the production of this wonderful newspaper amount to not less than two millions of dollars. Of this great establishment James Gordon Bennett, Esq., is the proprietor and director, and Mr. G. G. Howland the general manager.

In conclusion we may say that the Herald establish-

barrels would cost. The importance of carefully cleaning old oil barrels before putting other substances in them is shown by an accident at the Westinghouse Electric Works, Brinton, Pa. Castings were stored in an old barrel, which had contained wood alcohol and been reheaded. One of the workmen lighted a match to see what was in the barrel, and the gas which had

room is a marvelous sight. Here are to be seen a long row of magnificent steam printing presses of the very latest and most improved construction, mostly from the works of R. Hoe & Company, celebrated throughout the world for the excellence and reliability of their mechanism. Old printers regard with wonder the operations of these most remarkable machines, which print, join, fold, count and deliver perfected copies of the Herald at the astonishing aggregate rate of 288,000 eight page copies per hour

THE NEW YORK HERALD ESTABLISHMENT-THE PRESS ROOM CORRIDOR.

generated was exploded, throwing the castings in various directions, killing one man, wounding five others, and injuring the building.

Opaline Laninee,

A vitrified material, to which the name "opaline laminee" has been given, is made from silica 54 per cent, baryta 39 per cent, and soda 7 per cent. It is stated that the material can be made into plates of any required dimensions, and can be used for all purposes to which glazed tiles are commonly applied.

The Cocaine Habit.*

to the evils by which humanity is beset, and it promises Notwithstanding his former experience, one night he to excel even morphinism in the insidiousness of its stole from his home and satisfied his longing with growth, in blasting destructiveness and in the number cocaine. Pleasant thoughts and blissful dreams were of its victims. Under the influence of cocaine, the sub- the result. And thus he sustained himself from day to spoke of waves upon the surface of water too small and ject seems to enjoy a renewal of youth. Capacity for day. By stealth his wife obtained some of the drug, labor is augmented, and the need of sleep much dimin- and, finding exhibitation in its use, continued to adished. illusive impression on the unprofessional mind, pro-husband. To-day one is a raving maniac and the ducing pleasant sensations, inspiring courage and other is behind the bars, clamorous for cocaine. causing a general feeling of exuberant vitality, with apparently no unpleasant after effects; but while the immediate action of cocaine is more animating and agreeable than that of morphine, it is not nearly so were commissioned to build a small torpedo boat of slowly, and the whole appears to be moving so slowly enduring, and the bitter sequelæ are manifested ear- aluminum, with a view to making a craft that should that the nature of the motion can be seen. He prolier and in a form far more disastrous than in mor- bevery light, and thus be adapted to storage on the jected an enlarged image of a vibrating tuning fork phine intoxication. Cocaine habitues are utterly un- deck of a battle ship. The builders adopted an alloy reliable and disregard all personal appearance, going of aluminum and 6 per cent of copper. The plates and about unkempt, bedraggled and forlorn. While un- frame of the boat were of this material shaped cold der the influence of the drug they feel equal to any and were of medium hardness, of 14 to 16 tons per square task, forget the past, cherish hopes for the future, are inch of tensile strength. The portions subject to sea happy in and oblivious to their sad condition. With- or bilge water were riveted with aluminum rivets, and onds, so that the nature of its motion could be seen out it they are nervous, maniacal, morose and even the remaining parts, such as the deck, not subject to dangerous. The cocaine habit is a swift road to de- the action of sea or bilge water, were mostly riveted struction, and leaves in its wake a blight most terrible with soft iron rivets. to behold.

the greatly reduced price of cocaine, occasioned by im- ing over twelve months, and we find, provided there is provements in the process of extracting it from the no galvanic action due to other metals being in contact crude drug. Less than ten years ago, cocaine was with the aluminum, the corrosion may be taken at unworth 75 cents a grain; it can now be bought at the der 4 per cent per annum for plates about 1/2 inch The greatest difficulty in the work was in the mechanirate of two grains for five cents.

this habit. Prominent among these is the pernicious scribing should be painted, and the paint used should practice of a certain class of druggists (fortunately be carefully selected, avoiding any that contains bodies bullet, and the torn and thickened edges of the broken small in number) who offer cccaine when asked for which would have a direct chemical action on the film, as well as some little attached filaments of liquid something that will relieve toothache, neuralgia and plates. As further evidence of the effect of sea water beads of soap solution.-Photography. countless other aches and pains. It is impossible to upon aluminum, I would refer to the Vendenesse, a estimate the ruinous effect of such recklessness. To sailing yacht built of aluminum in Paris about eighteen the chronic sufferer, cocaine proves at first an inestima- months ago. The report of it as regards corrosion is as ble boon; but the first dose breeds an insatiable and follows: almost insuperable appetite, and with this comes all the trickery and depravity of an experienced victim. places where copper fittings have been fixed in direct Misery and the bitterness of remore would fill the soul contact with the aluminum hull, which has produced garrisoned by troops of the line, an officers' lyceum, in of the druggist who is so rashly indifferent as to incur a galvanic action. A similar action was produced when which captains will form one class and lieutenants this responsibility, had he sufficient imagination to see the boat was moored to a quay near another boat, the another; the instruction of these classes will be given before him a panorama of the degradation, suffering bottom of which was coppered, both being fastened to separately. From the work connected therewith no and ruin for which he has become chargeable.

vail that, in treating the morphine habit, cocaine is of deteriorating effect." great value, counteracting the effects of the morphine. Proceeding on this principle, numberless quacks have heat and alkalies. This material anneals at a com- capacity act as director of instruction, subject to the claimed ability to cure the morphine habit. The un-paratively low temperature, thus losing strength, while supervision of the department commander. He shall fortunates whom they have succeeded in deluding are the alkalies act very rapidly upon it. Consequently be assisted by a secretary, from the officers of the garperhaps cured of the morphine habit, but in its stead any part likely to be subject to a considerable rise of rison, whose duty shall be to keep a simple record of they become cursed with a vice far more ruinous than temperature should not be made of aluminum, nor the proceedings of the lyceum. The secretary shall all their former ills. Cocaine may counteract the effects should it be used for a condenser where soda may be not be excused from the same duty that falls upon of morphine, but when the action of the cocaine is ex- required for cleaning purposes. Aluminum at high other members of the lyceum. The commanding hausted the system demands greatly increased quanti- temperatures oxidizes with exceptional rapidity. At officer shall also be assisted by such assistant instructties of morphine, and this in turn produces a desire for low temperatures it does not oxidize so rapidly, and ors from officers of the garrison as may be approved more and more cocaine. To use cocaine for curing the the film of oxide on the surface protects the metal from by the department commander. morphine habit is like jumping from the frying pan_further action. into the fire.

cocaine has been administered in minor surgical opera- bronze and manganese bronze were used wherever and assignments to courses of study will be made with tions, and who, remembering its exhilarating effects, practicable. No aluminum was employed except for special reference to the requirements of examinations subsequently obtain and use the drug to their ruin.

cently beguiled into it by the influence of environment power. The boiler was of our usual type, with copper pedient to employ them as assistant instructors. and friends.

The cocaine habit is apparently incurable, unless the subject possesses a powerful will and renounces the construct a boat 60 feet in length by 9 feet 3 inches. use of the drug ere its vicious effects are manifest, beam, which, with 3 tons load on board, should blows caused by sorrow. Recent medical observations After the habit is once acquired, the system craves have a speed of 18¼ knots during a full speed trial of show that the physical results of depressing emotions the drug very much as the body craves food. When two hours, and which should not exceed 11 tons in are similar to those caused by bodily accidents, fatigue, this drug hungeris not gratified, the habitue suffers all weight, exclusive of the above load, The official trial chill, partial starvation, and loss of blood. Birds, the consequences of natural starvation, until his sys- took place on September 20, 1894, the average speed moles, and dogs, which apparently died in consequence tem recovers its normal condition. With overwork or obtained during two hours, under the above con- of capture, and from conditions that correspond in any mental strain the craving for the drug returns, and ditions, being 20:558 knots. The boat was carefully human beings to acute nostalgia and "broken heart,"

no avail. An extreme hunger prevailed in his system, The cocaine habit is a comparatively new addition and he could have no peace until this was satisfied.

.... An Aluminum Torpedo Hoat.

About two years ago the Messrs. Yarrow, of London,

With reference to corrosion from sea water, Mr. Yar-The growing prevalence of this vice is largely due to row says, we have tried a series of experiments, extend-

"... It has stood very well, excepting in a few Schofield :

the low pressure piston valve, for which purpose it for promotion.

tubes.

Our contract with the French government was to:

Infinitely Rapid Motions.

Lord Rayleigh, in lecturing upon the multitudinous motions of the waves of the sea, and the forces which govern them in their phases, as revealed by the researches of Stokes, Thomson, himself, and others, rapid to be seen by the eye. These, he explained, can only be made visible, and apparently slowed down so The occasional use of cocaine leaves a highly minister it to herself, guarding her secret from her as to be appreciated, by means of instantaneous photography, or by a series of instantaneous optical projections. Each flash of light, such as that of the electric spark, makes the object appear to stand still for a moment in one of its phases, and the flashes must be so timed as to reveal each phase so that they blend upon the screen, and its prongs appeared fuzzy from the rapidity of the motion, but when the projection was performed by properly timed flashes of light, he so slowed down the apparent motion that each prong appeared to make but one vibration in about two secwith ease.

He then projected upon the screen the photographs he took three years ago of bursting soap films, each taken by the light of an electric flash lasting less than one-millionth of a second. The soap films were broken by means of letting a bullet, wetted with alcohol, fall through them; a dry bullet would go clean through them, perhaps, a dozen times without breaking them. thick, the surface being unpainted. At the same time cal arrangements, to so time the flash that it should Several distinct causes result in the acquirement of it must be borne in mind that such a boat as I am de- occur just as the bullet had passed through the film. The photographs were good ones, showing the falling

Military Lyceums.

With the approval of the Secretary of War the following orders have been issued by Lieut.-General

There shall be established at every post in the army, the same post by means of chains. With the above officer of the line shall be excused excepting under In some way the erroneous notion has come to pre-exceptions, direct contact with salt water has had no such circumstances as would exempt him from any other duty at the post. The commanding officer of The two great enemies to the use of aluminum are the post shall be president of the lyceum, and in that

The president of the lyceum will prepare a carefully As regards the machinery of this little vessel there considered scheme of theoretical instruction, selected Another class of victims comprises those to whom is nothing special to note, excepting that aluminum from the subjects enumerated in Paragraph I hereof,

Some, ignorant of its possibilities for injury, begin seemed to answer well during the time the boat was in Field officers and captains over fifty years of age will this habit voluntarily; others are led into it by what our hands. The engines were of the triple expansion not be required to participate as members of the lyceum seems to them a necessity; and others, again, are inno- type, and indicated on trial from 275 to 300 horse in this part of the work, excepting as it may be ex-

Griet from a Medical Standpoint.

The nervous system requires complete rest after

is repelled only with the utmost difficulty. Each dose, weighed and found to be 10 tons. From this it will be were examined after death as to the condition of their produces uniform results.

usual quantities of the drug; then began a gradual vibration at all speeds was inappreciable. The French Grief cannot be ignored, neither can it be cheered tency, and the subject was completely prostrated. the same plan, of aluminum. Under skillful treatment he recovered after a time and appeared to be restored, but with returning labor and

schuk, Ph.G

creates a demand for a larger dose the next time, and seen that a speed of 134 knots beyond that contracted internal organs, and it was found that the nutrition of a point is seldom reached where a constant quantity for was obtained, and the weight was 1 ton below the the tissues had been interfered with, and the substance agreed maximum. In comparing this aluminum hull proper of various vital organs had undergone the same A single instance will illustrate the terrible possibili- with one constructed of steel, the approximate saving kind of degeneration as that brought about by phosties of this drug. A prosperous young lawyer, being in weight by adopting the lighter material cannot be phorus or the germs of infectious disease. The poison very much overworked and in great demand, sought taken at less than 2½ tons, which it must be admitted of grief is more than a name. To urge work, study, renewal of his exhausted energies in cocaine. For a is a large percentage in a boat weighing, complete travel, the vain search for amusements, is both useless long time this served him remarkably well, stimulating with its machinery, 10 tons. The machinery was found and dangerous. For a time the whole organism is his energies and producing an appearance of renewed to weigh about 40 pounds per indicated horse power, overthrown, and temporary seclusion is imperative for vitality. Presently his system failed to respond to the including the water in the boiler and condenser. The proper readjustment.

increase in the dose, with simultaneous reduction in authorities are exceedingly pleased with the boat, and up. It must be accepted and allowed to wear itself the effect. Finally the drug seemed to lose all po- have in contemplation the building of several more, on away. Readjustment comes slowly. Sorrow, grief. and all great misfortunes should be regarded as conditions similar to acute infectious diseases, which they

A CEDAR tree 467 feet high and 70 feet in circum- resemble in result; and later, as convalescence from anxiety came the old craving and morbid desire for ference at base has been felled near Ocosta, Washing- such diseases. Seclusion, rest, sleep, appropriate food, stimulus. This he resisted with all his energy, but to ton. It is a pity that all such great giants of the fresh air, sunshine, interests that tax neither mind nor * Extracts from an article in Bulletin of Pharmacy, by Albert N. Doer. | forest, whose age is counted by centuries, cannot be body, these are requirements in this class of illness.-The Charlotte Medical Journal. preserved from destruction.

RECENTLY PATENTED INVENTIONS.

Engineering,

BOILER.-Samuel P. Hedges, Greenport, N. Y. This boiler is designed for a stationary or in the brackets and an arm pivoted on the said brackets easily removed from the body of the refrigerator for purmarine boiler, which will not be top heavy, and in which the fire box is mainly composed of water tubes, and wherein other tubes affording circulation for water will be located immediately over the tubular fire box. The fire box tubes, etc., are arranged so as to permit of an even circulation and to permit of repairs being madewith the minimum less of time and money. The circulating pipes are so grouped that any one or more of the sections for the exit of the contents of the bottle in a divided to enable surveyors and others to readily obtain the sine may be taken out into the fire room without disturbing state. It consists of a neck band having its upper end or cosine corresponding to a given distance and to a any portion of the boiler, a blank header being intro- unbroken throughout its circumference and provided beduced in its place, so that the boiler can be fired up at low said end with a lateral opening or slot, and perfo- also forms a mechanical traverse table, giving for any once and continued in use until the repairs are made 'rated and imperforate plates pivoted at one edge and i angle and any distance the projections of the distance in the section to be replaced. The fire tubes can all be movable through the slot, independently into and out of reached from the fire box, taken out and others substituted, and the holes plugged with the tools ordinarily carried on steam vessels or usually at hand in the boiler room.

Mechanical.

H●SE REEL. - Clifton Giles Petherbridge, Rico, Col. The object of this invention is to pro- adjacent side edges, thus leaving an objectionable gap vide a new and improved hose reel which shall be sim- between the mirrors when they are opened. It has been ple and durable and is arranged in such a manner that found that the heavy plate glass mirrors strain the hinges the hose is always attached to a water supply, and by and parts of the frame to which they are attached, so that to which the arms are secured at their inner higher unreeling the hose the water is automatically turned on, the three sections will not correctly fold nor all stand in ends to the block and are provided with eyes at their so that, in case of a fire, for instance, considerable valu- a vertical position when so strained. The object of the ends through which passes a rope which connects the able time may be saved. The inner end of the hose extends through the aperture in the reel, and connects with proved method of construction, thereby strengthening the vertical member of a T-pipe, which connects with the the triple mirror and closing the gaps between the horizontal supply pipe. When the hose is unreeled, a valve mounted on the inner end of the horizontal supply pipe is opened, and the water flows through the Logan, Utah Territory. The essential features of this vertical member of the T-pipe, which is coupled to the hose.

Gainesville, Fla. The object of this invention is to remedy the defects in what is known as roller, sea island, or long staple gins. This is effected by reducing the number of parts by assembling what have hitherto been separate parts into groups, each part in a group being permanently fixed in its true position, relative to the other parts of the group, and the required elasticity or pressure is given by applying springs to each group as a whole, the groups being made adjustable to each other, whereby is obtained a gin having a wider field of usefulness, an improved quality of work and an increase of useful output, with less loss of time in adjusting and expense for | tion in brief is as follows : A letter is laid on the table, a repairs, and by which also the gin, while working, is brought under fullcontrol of the operator.

Brooklyn, N.Y. This invention relates to axle boxes, and more particularly refers to improved means of lubri- a stamp therefrom and pressing the same to a firm concating the same. The device consists of an axle having tact with the surface previously moistened, and thereby an annular recess and longitudinal channels communicat- $^{|}$ upon releasing the plunger the stamp receptacle and fol ing therewith and of a cap to cover the recess and form, lower will be carried to their normal position. This en an annular chamber. The cap is provided with an aper- tire operation is performed with one stroke of the ture through which a lubricant may be supplied. The plunger. axle box is provided with an interior recess adjacent to one of its ends. This end is adapted to engage a collar on the axle. The lubricant has access to the recesses in the axle and axle box and to the longitudinal channels of the axle.

FLOOR SANDPAPERING MACHINE. John Mack, Newport, Ky. This invention relates to animal, to throw the latter into a suitable receptacle. that class of machines which are used for smoothing and polishing floors. The object of this improvement is to Olney, New York City. The object of this invention is produce a machine of this class which may be run either to provide a device which shall be simple, durable and by hand or power, which has a convenient means for by hand or power, which has a convenient means for raising and turning its rollers so that it may be readily held in the other. A further object of the invention is moved to one side, which has a revoluble sandpaper drum adapted to come into contact with the floor, which has a convenient means for fastening the sandpaper to into contact with a knife and the holder or the cue is rothe drum and which is provided with a fan to carry away the dust.

Railway Appliances.

SNOW PLOW.-Patrick Henry Cradobject of the present invention is to simplify the construcice adhering thereto simultaneously with the removal of be held from off the track, thus permitting the engine to readily propel the plow forward or backward.

consists principally of a local lock for the signal, adapted to be unlocked from the next following station. In brief, it comprises a lock for the signal, a main lock circuit con-

simple and arranged in such a manner as to permit of frigeration. The device also provides means whereby conveniently cleaning and painting the same. The essential features of the invention are a reversible gutter and rigidly connected with the channels.

BOTTLE TOP. - Albert Wanner, Jr., Hoboken, N. J. This new invention relates to covers or caps for salt cellars, pepper boxes, etc. In this new bottle top, the top is a permanent fixture on the mouth of the bottle and is arranged to permit of filling the same with the desired substance and to form a perforated cap register with the neck band, and provided with edge finger holds whereby either or both may be swung

METAL FRAMED TRIPLE MIRROR.-Albert Wanner, Jr., Hoboken, N. J. In order to avoid excessive weight, the rectangular frames of triple mirrors are usually formed of light sheet metal struck into Ohio. This invention relates to an improvement in shape, the three similar frames being hinged together at canopies, especially to a canopy adapted as a covering present invention is to remedy these defects by an immirrors

WASHING MACHINE.-King E. Stoker, washing machine are a curved slotted bed or false bottom and two independently swinging rubbers arranged side ROLLER COTTON GIN.-James Doig, by side above it, and having semi-elliptical or half oval rubbing faces on their lower sides, and means for operat-ing these rubbers whereby the portions of the rubbers on the same side of the axis are made to alternately approach and recede from the bottom in their reversed rubbing movements.

MACHINE FOR AFFIXING STAMPS .-Adolph Sanders, New York ('ity. The object of this invention is to provide a machine for stamping letters and is so constructed that the stamps may be placed in removable holders, so that holders for any denomination of stamps may be attached to the machine. The opera moistening device moistens the surface upon which the stamp is to be affixed and recedes. Immediately there AXLE BOX.-Michael F. Deininger, after a follower enters into engagement with the stamp receptacle, carrying the receptacle downward and forcing

ANIMAL TRAP.-Estanislao Caballero de los Olivos, New York City. This new animal trap is provided with an opening for the entrance of the animal an outlet through which the animal may be thrown out and an inclined belt arranged adjacent to the outlet and adapted to travel downward under the weight of the

BILLIARD CUE CUTTER. - James B to provide a billiard cue cutter with a stationary knife, so located in a holder that when the end of a cue is brought tated, the said end of the cue will be trimmed expeditiously, smoothly and evenly.

ROASTER. - Norval H. McAuslan. Sutter City, Cal. The object of this new invention is to provide a roaster which shall be simple and durable in dock, Leadville, Col. This is an improvement upon the construction and is specially designed for use on ordinary snow plow formerly patented by the same party, and the stoves and ranges for roasting coffee or other articles. It is also arranged for the ready sampling of the article tion of the snow plow and to provide a means where by which is being roasted without stopping the machine the tread and flange face of the rails will be cleaned from and is devised to carry off the fumes arising from the roaster into the stove or range instead of allowing them the snow, and whereby also the weight of the plow will to escape into the room. The principal feature of the invention is an exterior casing adapted to be placed on the stove and opening into the same at its bottom, and a RAILWAY BLOCK SIGNAL LOCK AND drum provided with a damper adapted to open into the REGISTER .- John Dean, New York City. This invention exterior casing to cause the fumes to pass through the easing into the stove. The sampling feature has been re ferred to above.

SASH HOLDER. - Joseph J. Kellev. trolling the lock and operated from a distant point, a Great Falls, Montana. This improvement relates to a local lock circuit controlling the lock; the main circuit simple form of sash holder which is peculiarly adapted and the local lock circuit being provided with a movable | for use on car windows, but which may be applied to portion, and a track circuit arranged in relation to the any window sash. Sash weights may be dispensed with mevable part, so that the latter will normally close the and the sash may be held at any desired height. The degap in the main lock circuit and enable the latter to be 4 vice consists of small wheels of elastic material mounted closed, and open the gap in the local lock circuit, the track in proper casings on the window. These wheels are ar circuit being also arranged in relation to passing trains ranged to cause the sash to remain stationary in any poas to cause a movement of the movable sections of the sition in which it may be left by friction against the caslock circuits which will open the gap in the main lock ing. The wheels can be readily adjusted and are not circuit so that this circuit cannot be closed, and close the likely to get out of order. gap in the local lock circuit. CLOTHES LINE.-Jesse G. Work, Red-CAR COUPLING, -- Edward C. Inderlied. clyffe, Penn. This invention provides for a new and Rock Rift, N. Y. The object of this improvement is to improved clothes line, which is arranged to securely susprovide a car coupling arranged to securely couple the pend clothes without the use of pins, hooks or other cars and prevent accidental uncoupling, at the same time : separate devices, and is adapted to be conveniently holding the non-engaged link of one of the cars in a drawn taut at any time. The wire clothes line is formed proper resting position and without danger of interfering of sections that are pivotally connected and so conwith the coupling parts. The invention consists princistructed as to clamp the clothes and thus dispense with pally of a drawbar, provided with a forward hook and pins or other supplemental fastening devices. Any dea rear hook connected by an incline at its bottom with sired number of sections may be arranged between two the bottom of its forward hook. The invention further posts.

when the door is closed it will automatically adjust itself to form an air-tight connection with the wall of the comprising brackets and a channel adapted to be seated opening it is adapted to cover. The door may also be poses of cleaning, repairs, etc.

TRIGONOMETRICAL CALCULATING AND MEASURING INSTRUMENT .-- Adolphe L. Lacoste, Natchitoches, La. This invention relates to calculating and measuring instruments, and its object is to provide a new instrument which is comparatively simple and durable in given angle without the aid of tables. The same device corresponding to the angle and also forms a mechanical table of natural sines and cosines. The results are obtained by the proper manipulation of scales and verniers which is rendered possible by the ingenious construction of the instrument.

CANOPY.-Milton T. Weston, Kenton, for a carousel or like machine, the object being to provide a canopy which may be supported without the aid of a center pole. The canopy comprises a center block various arms or ribs, a cover having a central opening for the pin in the block and secured around its margin to the rope. The canopy is supported by independent vertical posts provided at their upper end with pins extending removably through eyelets. These posts are attached to the ground or an adjacent support in the customary manner.

NOTE .- Copies of any of the above patents will be furnished by Munn & Co., for 25 cents each. Please send name of the patentee, title of invention, and date of this paper.

SCIENTIFIC AMERICAN BUILDING EDITION. APRIL, 1895.-(No. 114.)

TABLE OF CONTENTS.

- 1. An elegant plate in colors showing a Colonial cottage recently completed for Frank L. Purdy, Esq., at Glen Ridge, N. J. Two perspective elevations and floor plans. An attractive design. Architect, Charles P. Baldwin, Esq., Newark, N. J. 2.
- Two perspective elevations and floor plans, showing a residence recently completed for George N. Tyner, Esq., at Holyoke, Mass. An elegant de sign in the Romanesque style of architecture. Mr. H. H. Gridley, Springfield, Mass., architect.
- 3. A cottage at Nutley, N. J., erected at a cost of about \$4,000. Perspective elevation and floor plans. Architect, Mr. E. R. Silton, N. Y. A simple but tasteful design.
- A Colonial residence at Orange, N. J., recently erected for John Hammond Bradshaw, M.D. A pure example of modern Colonial architecture. Two perspective elevations and floor plans. Messrs. Rossiter & Wright, New York City, N. Y. architects.
- An attractive residence at Indiana, Pa., recently erected for Mr. Harry McCreary, at a cost of \$4,350 complete. Perspective elevation and floor plans. Architect and builder, Mr. E. M. Lockard, Indiana, Pa.
- 6. Two perspective elevations and floor plans of a hand-Armour Villa Park, Bronxville, N. Y. A good ex-MountVernon, New York.
- A cottage at Glen Ridge, N. J. An attractive resielevations and floor plans.
- 8. A carriage house at Orange, N. J., recently erected for John Hammond Bradshaw, M.D. The design is treated in the modern Colonial style to correspond with the architecture of his residence. Ground plan and perspective elevation. Messrs. Rossiter & Wright, architects, New York.
- 9. An elegant resonce at Flatbush, L. I., recently erected at a cost of \$11,000 complete. Two perspective elevations and floor plans. Architect, J. G. Richardson, Esq.; builder, J. C. Sawkins, Esq., both of Flathush, L. I. An attractive design.
- 10. A house at Park Hill, N. Y., recently erected for Messrs. Loreni & Morrow, at a cost of \$6,500 complete. Perspective elevation and fioor plans. Mr. Edmund J. Maurer, architect, New York.
 - cellaneous Contents Moderne Innen. T

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NEW BOOKS AND PUBLICATIONS.

THE SLIDE RULE. A practical manual. By Charles N. Pickworth. Man-chester and London: Eumott & Company, Limited. Pp. 56. Price 80 cents. No index.

There is always something attractive in what may be termed the gymnastics of the slide rule, and the 56 pages of this little work contain an excellent resume, with practical examples, of what can be done by this instrument of the engineering shop.

A STANDARD DICTIONARY OF THE ENG-LISH LANGUAGE. Prepared by more LISH LANGUAGE. Prepared by more than two hundred specialists and other scholars, under the supervision of Isaac K. Funk. D.D., Editor-in-Chief; Francis A. March, LL.D., L.H.D., Consulting Editor; Daniel S. Gregory, D.D., Managing Editor; Associate Editors Arthur E. Bost-wick, Ph.D., John Denison Champ-lin, M.A., Rossiter Johnson, Ph.D., LL.D. New York, London, and Toronto: Funk & Wagnalls Com-pany. 1893. Printed in the United States. 2 vols. Pp. XX. 2318. the announcement in these columns that space does

The announcement in these columns that space does not permit us to do justice to some book which is under review has become perhaps too familiar to our readers, But when we find ourselves confronted with such a mass of errudition and labor as is represented by the two volsome residence erected for Samuel S. McClure, at umes of the Standard Dictionary, the old excuse must be brought forward again. The work is a monument to ample of a square rigged house. Cost \$8,000 the enterprise of the publishers and to the judgment of complete. Mr. Henry S. Rapelyea, architect, the editors. The editorial function seems to have been carried out with unusual judgment both as regards omissions and classification. The treatment of words dence in the Elizabethan style. Two perspective of two or more meanings is uniform, the most common meaning being always given first, while the extinct meanings are given last. The compactness of arrangement is secured by system. Thus under such words as apple, colors, etc., long lists are given, often of a hundred or more different terms coming under this head. The particular list under apple still further exemplifies the admirable system of the work. After each name of a va rietyis given in columns its size, form, color, quality, use. season, and ratings of adaptation for cultivation in the Northern, Central, and Southern divisions of the United States. Some three hundred varieties are in the table, and for each one the nine specific data specified are given. This one table contains therefore nearly three thousand separate data relating to apples. Many similar instances could be cited, but this will suffice to illustrate the methods. The list of specialists engaged as editors hundhand is a formidable one noarly -The evolution of an old building, with 4 views.— on the staff. The tendency of the day is in the direction Wood stains .- Wood finish chemically and micro- of cyclopedic dictionaries, and the Standard is as much of scopically examined.-A tubular frame house.-To a cyclopedia as it is of a dictionary. Many of our readers destroy hothouse insects - Venetian blinds, illus-, remember the stir made by the introduction of illustrations in the old Webster unabridged. The Standard is finely illustrated, not only with cuts, but with a number zen water closets.—An electrical mail box, illus- of beautiful colored plates. Beautiful examples of the latter are used to elucidate familiar flowering plants (under the word "PLANTS ") or gems and precious stones - The Rider engines, illustrated.—The Security (under the word "GEMS"). We are strongly tempted to continue, but will stop here, leaving to the users of the book the appreciation of its extraordinary merits and value. The two volumes are easily handled and fitted for every day use. They are provided with thumb notches for the letters, so that any letter can at once beturned to. The list of editors, each for his own department, enables the consultor to feel the weight of authority for each specific word. The appendices of disputed pronunciations and spellings and other more or less extraneous matter are of the highest value and interest. The list of foreign words and phrases is excellent. " Deus ex ma-1 & CO., PUBLISHERS, 361 Broadway, New York. a non lucendo "might be given.

consists of a drawbar, provided on its sides with inclined resting lugs adapted to support the link.

Miscellaneous.

DOOR FOR REFRIGERATORS. - Carl Sander, Brooklyn, N. Y. The object of this invention is to provide a means whereby the door of the refrigerating compartment when opened may be carried to a horizon-

REVERSIBLE GUTTER. - John Andy tal position and slid within the compartment, whereby Freeze, Mason, Texas. The object of this new invention the escape of the cold air from the ice compartment is pre $is \ to \ provide \ a \ reversible \ gutter \ which \ is \ comparatively \ vented, \ thus \ reserving \ all \ of \ the \ cold \ air \ for \ service \ in \ reversible \ service \ in \ reversible \ service \ service$

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Za Boles & Daneries	Rook stanling maching by Uast	538,039
	Bottle self-sealing, W. A. Miller	537,843
	Bottle lock W. E. Foster Bottle stopper, L. Kalling. Bottle stopper, L. Kalling. Bottle stopper, internal, F. R. H. Thomas Bottle top, A. Wanner, Jr.	537.946
HINTS TO CORRESPONDENTS.	Bottle wiring machine carrier, Wile & La Casse Bottles, draught tube for siphon, R. Garrard	537,877
Names and Address must accompany all letters,	BOW, Cross, J. A. Coales	537,817
or no attention will be paid thereto. This is for our information and not for publication.	Brake. See Electric brake. Bridle bit, J. Stanley	538,049
References to former articles or answers should	Bridle bit, J. Stanley Broom, combination whisk, A. F. Middaugh et al. Brush, W. F. Ziehler	537,954
give date of paper and page or number of question.	Bucket and transporting apparatus, power-ope- rated, J. Pollock Buckle, back band, W. F. Anthony	538,121
be repeated; correspondents will bear in mind that some answers require not a little research, and,	Burglar alarm window sash, J. Schoneberger	538,059 538,128
though we endeavor to reply to all either by letter or in this department, each must take his turn,	Burner, See Gas burner, Gas regulating hur-	
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Minerals sent for examination should be distinctly	Car coupling, A. Rus bforth	538,085 537 942
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(6504) A. A. B. says: Please inform me	Car door, W. E. Hoyt.	538,165
through your columns how to make a liquid to transfer	Car, dumping, J. M. Landrun. Car, electric motor, W. Robinson.	537,835
photographs or printed matter from paper on glass. A.	Car fender, T. O'Brien Car, hand, J. Donovan	220'113
Any picture, print or even clipping from newspapers, any	Car heating apparatus, J. O. C. Searle.	538,184
engraving, no matter in how many colors, or on what kind of paper, may be transferred to glass, says a con-	Car life-guard, H. Mills. Car platform foot plate, H. H. Sessions Car seat construction, G. M. Bril	538,087 538,036
temporary, only the treatment of the different kinds of	Cars, collapsible gate for railway, Francis & Tay-	520 161
paper differs. Place the object to be transferred, face		538.104 538.200
downward, upon a larger sheet of manila paper; pre- pare a solution of from one to three per cent of nitric	Carding engine clearer screen, L. Rascoe Cash and sales register, C. Fisher Cash and sales register, Loewenbach & Fisher Cash indicator, vault, S. R. Hamilton	538.100 538,172
acid in water, according to thickness and strength of	Cash indicator, vault, S. R. Hamilton	538,109 538.171
paper and how strong it was sized; ordinary newspapers	Cash register, Loewenbach & Fisher Chain, drive, C. H. Davids Chain, machine for automatically making wire,	538,222
and printings or engravings on unsized glaze paper re-	C. F. Smith	537,863
quire even less than one per cent nitric acid. One of the purposes of adding nitric acid is to remove the sizing	Check hook, D. F. Maine	537,840 538,140
out of the paper. Apply this solution with a sponge to	Cheese safe, G. Habig	538,070
the back of your object to be transferred; be careful not	Chopper. See Meat chopper.	538 082
to overdo it; you only want to render the paper soft but not wet. Continue sponging with this solution until	Checka rein Orient J. F. Wilson. Checka safe, G. Halfs Chenile cloth, machine for cutting, W. Talbot Chopper. See Meat chooper. Orack. 5. Nach tigal. Clarmon Id. D. Brul. Clarmon M. B. Wire sticing clamp. Clasp. See Collar Clasp.	538,189
you see the printing plainly; that is, until the paper be-	Clasp. See Collar clasp. Clasp. G. E. Adams	537 955
comes transparent. Clean the glass plate thoroughly	Clasp, G. E. Adams	537,974 538,220
with alcohol by means of a ball of clean cotton; dry it off well; wash it with turpentine; dry it off again;		
place the glass plate upon a smooth elastic layer-for	Closet, H. E. Keeler. Coffee can, L. Bechaux, Fils. Coffee pot, A. Fay.	537,961 538,191
instance flannel-and with this elastic layer upon a table.		537,906 537,872
or better yet, upon a rubber blanket in the litho hand press. Now coat the cleaned surface with a thin coat		537.895
of half turpentine and half dammar varnish; let it dry	Color mixing top, M. Bradley Combustion of coal, etc., compound for and pro-	537,877
from ten minutes to one day, according to temperature	cess of aiding, Spring & Retwitch Commutator brush, L. Boudreaux Concentrator, W. Tarrant Conductors, separable terminal for, D. N. Osyor Conductors and L. Concidential for, D. N. Osyor.	537.998 538,097
and thickness of dammar varnish. The coating should not be allowed to dry entirely; it should be a triffe ad-	Concentrator, W. Tarrant. Conductors, separable terminal for, D. N. Osyor.	537,945 538,083
hesive. Lay your impression face downward upon the	Converter, H. J. Lewis. Conveyer, L. D. Howard Cooking vessel, Wilson & Ziegler.	538.111
glass plate; it is important that neither acid nor water	Copy holder, C. C. Wheeler	537,952
touches the surface during the entire process. To pro- perly lay down the impression, take it up with both hands	Copy holder, C. C. Wheeler. Copying apparatus, B. Von Szczawinski. Core coating composition, Thompson & Steele. Corn drill, double lister, J. T. Wheeler. Corn drill, double lister, J. T. Wheeler.	538,135
by holding the left hand under corner and the right hand	Corset wire capping machine, M. L. Hotchkiss	537,891
upper corner; be careful not to get any air bubbles under	Corset wire capping machine, M. L. Hotchkiss Corrundum mill, H. S. Lucas. Cot or bed, folding, J. S. Mackie Coupling. See Car coupling. Electrical connec- tion coupling. Hose coupling	537,839
the sheet. This is best accomplished by marking upon the plate the exact position and size of the sheet. Lay-	tion coupling. Hose coupling. Cultivator, W. H. Traphagen	
ing down the paper first, adjust the right hand upper	Cultivator and stalk cutter, combined rotary, G.	
corner to the mark on the plate, hold it there with the	W. Bushong. Curtain banger, Keenan & Eden. Curtain bolding device, J. A. Lidback. Cut-out, electric, Wagner & Schwedtmann Cut-out system surformatic, L. Borraduile	537,980 538 196
tip of your finger and adjust the left hand lower corner, but be careful to avoid air bubbles. Press the sheet to	Cut-out, electric, Wagner & Schwedtmann	538,090 538,224
the adhesive dammar coat. This may be done in many	Cut-out system, automatic, L. L. Borradalle Cut-out system, automatic, L. L. Borradalle Cutter. See Billard eue cutter. Pipe cutter. Siding cutter. Vegetable cutter. Cyclometer, W. W. Hastiugs.	
different manners. It does not require a very strong	Cyclometer, W. W. Hastiugs	537,824 537,896
pressure, but it should be observed that each and every spot has to be pressed repeatedly against the plate. When	Cyclometcr, H. A. Loew. Damper regulating apparatus, A. P. Burnham Decorative films, device for applying, W. H. Coe. Dental impression tray, G. W. Traphagen	538,150 538,208
the paper sticks quite smoothly to the plate, fan it per-	Dental impression tray, G. W. Traphagen Dental pallet. J. Hellings	538,204 538,110
fectly dry, and then with wet finger tips slowly rub off	Dental pallet, J. Hellings Dentures, articulator for making artificial, K. R. Bragg.	597 010
the paper. If this is done with great care, you will re-	brage Deodorizing beating apparatus, L. J. Tracy Derrick, floating, J. E. Walsb. Designs upon paper or other surfaces, process of	537,812 538,137 537,874
move every vestige of paper, and the print, of whatever color or nature it may be, will remain on the glass plate.		537,923
Upon this apply another coat of dammar varnish con-	Digger. See Potato digger. Dilator. E. J. Parker	538.120
taining very little turpentine. With too much turpen-		
tine, you run the risk of washing the entire picture from the plate again.	Drawer or cabinet, label, C. C. Ramsay. Drawer or cabinet, label, C. C. Ramsay. Drawing kit, Nowland & Bradley.	538, 127 537,853
(6505) C. S. asks: 1. Fully describe the	Drift. See Corn arm.	£ 20 000
common return system of telephone wiring for exchange	Duplicating apparatus, S. L. Conde Dye, blue, T. Sandmeyer	538,066 538,215
purposes. A. For telephone exchange connections we		
refer you to the SCIENTIFIC AMERICAN, No. 13, vol. 60,	Electric brake. E. D. Lewis Electric circuits, method of and apparatus for protecting, J. M. Oram	537,932

р N 1004. 2. What would be the effect if each plate of a storage battery were inclosed in a porous clay envelope, like carbon in porous cup of open circuit batteries? A. It would increase the resistance without any compensating advantage. 3. If ampere capacity of plates of a storage cell is 6 amperes, would a flow of 1 ampere for 6 hours exhaust it ? A. Divide the ampere hours by ten to get the working current. "Ampere capacity" should mean the working current.

INDEX OF INVENTIONS For which Letters Patent of the

apparatus for treatment of, E. A. 533,055 Ing machine, F. Hart. 533,035 5, W. E. Forster 537,370 Fscaling, W. A. Miller 537,373 pper, I. Kalling 537,345 pper, internal, F. R. H. Thomas 537,346 (A. Wanner, Jr. 538,492 ing machine carrier, Wile & La Casse. 537,377 aught tube for siphon, R. Garrard. 532,377 aught tube for siphon, R. Garrard. 532,377 (J. A. Coates. 537,317 te Electric brake. 537,317 (J. Stalley. 532,000)

 Construction
 Construction
 S37, 969

 reburnent, C. J. Herrherg.
 S38, 075

 ric guest, F. O. Smith.
 S37, 960

 Corree can.
 Oil can.
 S38, 075

 I.T. Weston.
 S38, 076

 ing, C. W. Hinton.
 S38, 085

 ing, A. F. Rublmann.
 S37, 935

 ing, A. F. Rublards.
 S38, 085

 ing, S. Selden.
 S38, 085

 ing, S. Selden.
 S38, 085

 ing, J. M. Landrun.
 S37, 535

 ric motor, W. Robinson.
 S37, 535

 ric motor, W. Robinson.
 S37, 535

 ric motor, W. Robinson.
 S38, 053

 ing apparatus, J. Q. C. Searle.
 S38, 163

 j. Lafore.
 S38, 163

 ing apparatus, J. Q. C. Searle.
 S38, 163

 sales register, C. Ciaber.
 S38, 163

 sales register, C. Ciaber.
 S38, 163

 sales register, C. Ciaber.
 S38, 164

 ric matrix, S. R. Hamilton.
 S38, 163

 sales register, C. Ciaber.
 S38, 163
 OIL
 Decletion estimation for imaging artificial, R. R.
 537,812

 Performed estimation of the matter of the

	Grindstone trimming device, M. T. Hall	Stamp af Stapling
	Gutter, reversible, J. A. Freeze	Stationa
	Harrow, E. E. Whipple	Loew Steam bo Se am 1
	Heater. See Feedwater heater. Watering trough heater.	Steam ge Steam tr
	Heel burnishing machine, wax, J. O. Collins 538,209	Steaming Stitch se
	Hinge, Moore & Cox	Hada
1	Hinge, water closet seat, T. C. Beaumont	Stoneeut Stopper.
	Heel machine, E. F. Connors. 537,814 Hinge, Moore & Cox. 537,844 Hinge setting gage, Thielen & Schroeder. 537,844 Hinge water closet seat, T. C. Beaumont. 538,061 Hitching device, horse, U. E. Miller. 537,844 Hoe and Take, combined garden, C. Bailey. 538,914 Horsebue, J. Chanmann. 588,917	Storage Storage
	Hone coupling F Hone 507 005	Stove, of Stove or
	Hose coupling, F. Hong Hose coupling, F. Hong Hose coupling, B. Hong Hose coupling, S. Hong	Stoves, a Sugar wa
	Index device for books, C. L'Enfant	Switch.
	Hot air pumping engine, H. Denney	Swivel. C Tank. S
	Iron, apparatus for manufacturing pig. C. P. Wil-	Telephon Thermon
	liamson	Thrashir
	pig, C. P. Williamson	Time rec Tire, cy c Tires, t•
	rial to, H. H. Cummings	Toe weig Tongue
	Lamp, hauger, D. Aitchison	Torpedo Towel ho
	liamson	Toy ban Toy can
	Lamna wick adjustor for control drought W A	Toy, med Tram way
	Latch C. W. Kerler 538078	Transom Trap. S
	Latch, P. Lebel	Traverse Treadle
	Lathing, metallic, G. Hayes	Truck h
	K. Bigelow	Trunk ha Truss, Sj Tube.
9		Truss, Sj Tube. S Tube, ke Tubler
	Leathermarkingmachine, W.S. Soule	Tunnelir
	Lens for lens systems, etc., a chromatic dispers-	Type ma Merg
	ing, P. Rudolph	Type writ Type writ
	Linoleum into sheets, method of and apparatus for rolling, Melvin & Cartledge	Typewri nett Valve, V
	Linotype machine, P. T. Douge	valve, a
ľ	Linotype machine, C. Skatulia	Valve ar H. C.
Ì	Lock or latch, C. R. Heizmann	Valve fo house
1	Loom letter off mechanism. W. Talbot	Vegeta • Vehicle
	Loom take-up mechanism, W. F. Kmtzmg 537,893 Loom temple, H. W. Mason	Vehicle, Vehicle
		Velocipe
		Voting n Wagon b
	Lubricator. See Axle box habricator. Mail marking machine, Etbridge & Waite, 538,017to 538,019 Manura distributer L D H Alexander	Washer. Washing
	Manure distributer, J. D. H. Alexander	Washing
1	Meat chopper, C. G. Schmidt	Watchm Water ta
	Mill. See Corundum mill. Mining machine, H. B. Dierdorff	Waterin Weather Wheel.
	Mould. See Cigar mould.	Winding
	Music box damping mechanism, G. A. Brach- bausen	Windmi Window Window
	Music box note plate or cylinder, G.A. Brach- hausen	Wire be
	Music leaf turner S. D. Case	dreie Wire spl
		Wire str
	necks of stringed, J. S. Back	Wood, e Wool du
;	ardson	Wrappen ing, I Wrench,
	Nut lock, D. C. Thomas	Wrench, Yoke, ne
	Office door indicator, A. F. Brandenburg	
	Oil can, S. Dunlap. 538,103 Oil can, F. J. Maroif. 538,174 Ordnance breech mechanism, Dardier & Mell-	
	Ordnance breech mechanism, Dardier & Mell- strom	Apparel,
	strom	Hann Boots an
	Packing press, Cushman & Guthrie	Butterin Cards, pl
	Peat disintegrating and compressing machine, E. Stauber	pany Cigars,
ł	Freat institute granting and compressing machine, L. 537,909 Stauber 537,909 Photographics print washer, C. J. Dorticus. 537,308 Photographics putter, F. A. Brow nell. 537,316 Piano tuning device, L. Orser 538,079 Piano tuning device, L. Orser 538,178 Piano tuning device, L. Orser 538,178 Piane tutter, orn, H. Petefish 537,551 Piers, watchcase spring, E. R. Kant. 537,532 Plow, Panew U. Casaday 532,855	Hava Cigars, pany
	Piano key action, T. H. Knollin	Cosmetic
5	Pipe cutter, O. B. Hall	Firm Cure, con
	Phers, watchcase spring. E. R. Kant	Cure of eases
1	Pliers, watchcase spring, E. R. Kant. 537,931 Plow, gang, W. L. Casaday. 538,655 Plow or enkivator araught attachment, W. R. 537,968 Plows, skeleton mouldboard for. S. Salter. 537,368 Plows, skeleton mouldboard for. S. Salter. 537,368 Plug, sanitary, T. A. Jennings. 537,864 Plot, sintary, T. A. Jennings. 537,864 Post, See Fence post. 537,853 Potato digger, F. J. Wood. 537,953 Poresr machine. manual. W. K. Crofford. 537,957 Press. See Packing press.	Flavorin Comp
	Plows, skeleton mouldboard for. S. Salter	Flour, J. Flour an
-	Plug, sink, C. E. Smith	Flour, w
	Pot. See Coffee pot. Potato digger, F. J. Wood	Food pr pany
	Prower machine, manual, W. K. Crofford 537,917 Press. See Packing press.	Gloves, l Gum, ch Hairton
è	Printing machine, envelope, J. H. Reinhardt 537,903 Pulp boiler, wood, N. P. Wedege	Leather,
1	rower machine: infiniti, w. A. Crouord	pany
	Puzzle, A. B. Watson	Meat ex teln
	Puzzle, A. B. Watson. 537,350 Pyrometer, E. Brown. 538,149 Racking apparatus. liquid, W. C. Savase. 537,350 Railway crossing, M. D. Pratt. 538,159 Railway, cleetric, C. G. Wolpers. 538,159 Railway, electric, C. G. Wolpers. 538,156 Railway rolling stock. brake for, C. Luyers. 538,156 Railway rolling stock. brake for, C. Luyers. 537,354 Railway signalit. T. P. McDonough. 537,354 Railway signalit. T. Donovan. 538,116 Railway switch. J. R. Cribes. 538,116 Railway switch. b honovan. 538,116 Railway switch shifter. street, T. Thompson. 538,107 Railway switch shifter. street, T. Thompson. 538,108 Railway switch shifter. street, Switch tonigue for. 538,108 Railway switch shifter. street, Switch tonigue for. 538,108 Railway system, electric, J. M. Faulkner. 538,058	Medicina Metal po Mineral
	Railway points and signals by electricity, work-	Oils, illu
	ing of, I. A. Timmis	Pants or Perfume
	Railway rolling stock, brake for, C. Luyers 537,984 Railway signal, T. P. McDonough	Pins, toi
3	Railway signaling, treadle for use in, J. G. Dixon 538,156 Railway switch, J. R. Cribbs	Remedy Remedy
1	Railway switch, J. Donovan	Soap, to
	Railway switches and mates, switch tongue for, D. F. Carver	fume Stays, de
		Steel, cr Steel, ro
ł	Recorder. See Time recorder. Refrigerator car, G. B. Zantzinger	Stove po
2		Tonics, 1 Mahe
	Rein guard, driving, F. E. Hall. 537,975 Revolving chair, J. M. Morgan. 537,978 Rheostat, G. H. Wbittugham. 537,878	Velvetee Watches Whisky
)	Ring. See Traverse ring.	Whisky Wine, pi P. Vi
E	Roasting ores and recovering vapors therefrom,	P. VI

TRADE MARKS. am named wea

Apparel, certam named wearing, Burnham,	00.00
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Boots and shoes, walker & whitman Butterine, Wilkins & Company	20,441
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Cigars, snuff, and tohacco. Best & Russell Com-	
pany Cosmetics, lotions, perfumery, cream, and soap,	26,468
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Firm of W. Rieger	26,452 26,450
Cure, corn. J. S. Tripp Cure of rheumatism, gout and analogous dis-	20,400
eases, liquid compound for the. W. R. Warner.	26,446
Flavoring materials for food, Montgomerie &	~0,110
Company	26,462
Company Flour, J. C. D'Azevedo	26,459
Flour and other cereal products H-O (Hornhy's	
Oatmeal) Company Flour, wheat, Topeka Milling Company	26,461
Flour, wheat, Topeka Milling Company	26,460
Food products, certain named, H. Eggers & Com-	90 450
Cloves kid I Wenemeker	26 438
Gum chewing Faultless ('hemical Company	26 463
Hairtonic, T. Tomlinson	26.451
Leather, gloves. and mittens. J. C. Allen	26,439
Gloves, kid. J. Wanamaker. Gloves, kid. J. Wanamaker. Gum, chewing, Faultess Chemical Company Halr tonic, T. Tomlinson. Leather, gloves, and mittens, J. C. Allen Malted dry food extracts, Horlick's Food Com-	
pany. Meat extracts, Fabrik Von Maggi's Nabrungsmit- teln Actien-Gesellschaft	26,455
Meat extracts, Fabrik Von Maggi's Nahrungsmit-	00 457
Medicinal tableta Billinga Clann & Company	26,457 26,449
Medicinal tablets, Billings, Clapp & Company Metal polishing materials, H. Ryan & Company	26,449
Mineral water, natural, L. Janos	26,464
Oils, illummating, Parlor Oil Company	26.475
Pants or trousers, H. B. Resenthal & Company	26,440
Perfumery, toilet waters, and hair washes or dressings, W. S. Thomson	
dressings, W. S. Thomson	26,453
Pins, toilet, Jewell Pin Company	26,432
Remedy, catarrh, J. L. Pree. Remedy for cholera in chickens, hogs, and other	26,447
Remety for cholera in chickens, hogs, and other	26,465
animals, R. Faulkner. Soap, toilet and laundry, Oakley Soap and Per-	20,400
fumery Company	26.454
Stays, dress and corset, J. Janowitz	26,442
Steel, crushed, Pittsburg Crushed Steel Company.	26,470
Steel, rouge, and putty powder, crushed, Pittsburg	
Crushed Steel Company	26,472
Stove polish, waterproof, A. F. Tripp	26,474
Tonics, pills, powders, plasters, and tablets, J. J.	26,448
Maher.	20,948
Velvateens, S. Rosenberg & Company. Watches and portable clocks, W. C. Ball26,433 to Whisky and while, M. L. Wolf	26 436
Whisky and wine, M. L. Wolf. 26466.	26.467
Wine, preparation for use in making vermouth, P. Vidal.	
P. Vidal	26,465

	Fence, wire, Mount & Cook	Rubber, manufacturing liquid vulcanized, C.	DESIGNS
United States were Granted	Fertilizer and makingsame, C. J. Greenstreet 537,822	Barus 538.147 Saddle, pneumatic, H. G. Stiebel, Jr. 538.059	DESIGNS.
	Firearm, magazine, Ashtor & Kelly 537,958	Saddle, pneumatic, H. G. Stiebel, Jr 538,059	
	I Hirearms, magazine for, Ashton & Kelly	Safety gate E. Zarein Ba 331.000	DISCUIT. H. WAIIKIII
April 23, 1895,	Fire door or shutter, H. T. Moody 538,026	Sand Dapering machine, floor, J. Mack	Book mark, D. Stone 24.233
April 20, 1000,	The extinguishing and alarm annaratus allto-	Saw H J Bredorick 538.107	Brick fire, A. B. Clunies, 24.244
	matic, H. B. Dunham 538.016	Saw file guide, A. Kaempfer 537,827	Carpet, W. L. Jacobs 24,252
AND EACH BEARING THAT DATE.	Fire kindler, D. W. Brummett 537,815	Saw file guide, A. Kaempfer	Cresting, ridge, W. H. Mullins 24,248
AND EACH DEARING TRAI DAIL,	Fish or bait, artificial, A. Kelley 538,169	Sawmill set works, automatic receding, A. S.	Currycomb, A. R. Dickinson
	Fishing reel. F. Wilkie 537.878	Petticrew 537,902	Currycomb, A. R. Dickinson
[See note at end of list about copies of these patents.]	Flue scraper J R Noonan 537.845	Sawing machine, J. C. Horstmeier, 538,041	Garment supporter loop, G. W. Hoyt 24.234
[bee hole avenuer hor about copies of these patentist]	Fluid distributer, R. H. Burns	Scale, computing, W. Lawton 538.114	Gas burner, J. F. Hewitt
	Food warmer, infant's, D. R. Wilder 538,056	Scale, weighing and price, C. H. Schaaff	Giass dish. W. C. Anderson 24239
Advertising device, G. F. Watchtershauser 538,138	Foundations, method of and apparatus for con-	Scissors or shears, J. G. Bestgen 335,032	Insulator holder, L. S. Beardsley 24.249
Air brake air reservoir, B, A. White	structing, R. L. Harris 538,073	Scraper holder. J. Carriere	Pattern for printed fabrics. L. Kuenemann 24.251
Air cushiomng device, S. Whitlock	Fruit shipping package. H. Baskerville 538,219	Scraping and dumping vehicle, Tracy & Abbott. 538,245	Pipe, V. Simon'n
Air signal and brake pipe cock, combined, W.	Fuel. artificial, J. D. Oligny 537,931	Screen See Window screen	Pitcher, A. S. Butler 24 238
Crawford			Razor handle, M. C. Lefferts
Alarm. See Burglarm alarm.	S Turner	Screw making machine, F. H. Richards	Receptacle, ornamental, G. H. Berry 24,232
Amalgamator, Daniels & Allison 538,099	Furnace, G. W. Walker 538,030		Receptacle, ornamental, H. Berry 24,231
Ammal trap. E. C. De los Olivos	Furnace draught regulating apparatus, T. Langer 538.046	Seal, car. L. A. Foote	Sad tronholder. J. Graves 24,240
Arches, sidewalks, etc., constructing steel and	Furnace feeding for chain grates, W. H. Berry 538,148	Sewing machine, D. C. Bellis	Soap cake, H. B. Curtin
concrete, Stamsen & Blome 537,866	Furnaces steam and air feeding device for. ".	Sewing machine, L. H. Smith	Spoon, etc Purdy & Peters
Archways, portable center for constructing con-	Belcher	Sewing machine for hemstitching, A. J. A.	Stove, heating, J. Wilson 24.242
tinuous 9 // 070 537 971	Gage. See Hinge setting gage.	Oesterreich	Stove water front. A. B. Clumes 24,243
Auger, earth. H. M. Patterson	Garment supporter. G. E. Adams	Shaft and journal box, rotary, A. S. Vose 538,055	Tobacco casing, W. Hoffbauer 24,237
Awlo how hall beaming Chamford & Condilo 520019	Cos humor I A Crossford 538155	Shoaf carrier W. W. Rilpson	
Axle box for metal wheels R S Crawford 538011	Gas. charging liquids with, J. Schneible 538,86	Shoe horn, S. 1. Woodward 537.881	
A vio hov hibricator car I S Patton 537 848	1 Gas or similar motor engine. A. B. Bellamy	Shoe fongue and lacing holder. W. F. Fallon 001, 702	A printed copy of the specification and drawing of
Axle box or bearing, locomotive, J. Richardson., 538,181	Gas regulating burner, R. Wynell 538,006	Shutter Worker, J. H. Preston	any patent in the foregoing list, or any patent in print
Bat. ball, A. H. Kennedy 537,927	Gate See Safety gate	Sidewalk g rdered. J. W. Garvy	issued since 1863, will be furnished from this once for
Battery. See Storage battery.	Gate, J. H. Christopher 338,134	Siding cutter and gage, T. W. Purdy 538,122	25 cents. In ordering please state the name and number
Bearing, roller, J. Fleming, Jr 538,211	Gear. elastic friction, C. A. & O. W. Hult 537,977	Signal. See Air signal. Railway signal. Railway	of the patent desired, and remit to Munn & Co., 361
Bed bottom, spring, R. S. Osborne	Gearing, multiple speed, B. F. Burdick 537,816	train donger signal	Broadway, New York.
Pod folding I mool 597 060	Concrator See Steam generator	Sled hoh I Stephens	C
Belt fastemng device lady's W.S. Sillcocks Jr. 538 201	Globe, light, J. B. F. Fredureau	Sodawater tountain, R. M. & R. M. Green, Jr 550,009	Canadian varents may non se ostanica sy the
Bievele lock, A. Kellev	Grain adjuster, H. E. Pridmore 537.852	Spark arrester and conductor, C. P. Johnson 537,826	ventors for any of the inventions named in the fore-
Billiard cue cutter, J. B. Olney 538,119	Gratil.g, Jall, R. P. Manly		
Bit. See Bridle bit.			
Boiler. See Pulp boiler. Steam boiler.	for, F. W. Fuller 537,971	Stalk loading apparatus, R. Widdows 533,186	York. Other foreign pavents may also be obtained.
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