[For the Scientific American.]

PLATINIZED LOOKING-GLASSES.

BY C. WIDEMANN

NO. III.

It is now unnecessary to use glass free from color or to require parallelisms of the two surfaces. Bubbles of air, stripes, foreign bodies, pieces of the pots, etc., etc., do not interfere with the process. There is then an economy of 50 per cent in the glass.

In order to manufacture a looking-glass of 5 millimeters thickness, they use at the St. Gobain works a plate measuring 10 millimeters thickness. At the Wailly-sur-Aisne works plates are used having but 7·5 millimeters thickness, as it is only necessary to polish the glass on one side. From this a saving is made of 25 per cent on the thickness of the glass.

Very correct calculations show that Mr. Dodé secures an economy of 80 per cent on platinized glasses, as he uses for that purposes only inferior glass, commonly used for flagons; even common brittle glass can be used without the least difficulty. To this saving there is another to be added, which will astonish the reader. A square meter of glass absorbs about 183 grammes of mercury and 550 grammes of tin, representing about a cost of 4 francs, 40 centimes. A square yard of platinized glass costs 1 franc and 20 centimes for platina. It results from this, that at the Wailly-sur-Aisne works, the superficial square yard of platinized glass is sold at an average of 25 francs. This price is doubled in the mercury manufacture.

There is another circumstance for which this new process is recommended to the public. It is with great difficulty that mirrors are obtained with a curved surface. By the platina process this difficulty disappears, and it is as easy to manufacture curved, round, etc., as horizontal mirrors. There is also no inconvenience arising from upsetting the glasses in transportation, or in placing them in the frame.

Already in this country a company has been organized to manufacture reflectors by the means of silver mica leaves on the posterior face, and fastened together so as to obtain a large reflective surface possessing the desired curves. They are cheap, and easily repaired; but they meet with two great difficulties: the quick alteration of the silvery surface caused by the hydrosulphurous gases of coal with which locomotive reflectors are always in contact, and the want of transparency of the mica and its yellow color. I have no doubt that by the adoption of the platina these evils would have found their remedy, for, as it has been seen before, the reflecting surface is on the anterior part of the glass.

A quite peculiar property of the platinized mirrors will no doubt be applied by architects. The platinized glasses forming mirrors are transparent when the light passes through them. A person placed in the rear of an office can see everything going on in the front office without himself being seen. I insist particularly on this property; it appears to me to give to the platinized glass quite a new application which will increase its sales. This transparency is easily explained considering the small quantity of platina deposited on the glass, which quantity is not large enough to give opacity to the glass and prevent the luminous rays from passing through it. This transparency has received a very amusing application quite lately in Paris, mirrors called *mirrors à surprise*, are sold, which, when a black paper at the back of the glass is removed, allows a photograph or any other image to be seen through the metallized surface appearing as a specter; this photograph is simply applied at the posterior side of the reflecting part, and oiled in order to add to its transparency This toy is varied in very different ways, and has just been applied in the new play of "The White Cat" at Paris, and has caused an immense sensation. So I have no doubt that the inventive mind of the Americans will find thousands of applications for this property, either in applying it to the decoration of stores or to external ornamentation. In theaters or concert halls among flowers it produces the most fairy-like effect. The window glasses of a parlor made thus would be transparent in day time, and at night, when the shutters are closed, the whole window would appear as a large looking-glass, and reflect all lights and objects in the apartment.

The manufacture of glasses with amalgam necessitates great labor. In order to obtain 50 meters of looking-glass a large number of hands and a large plot of ground are required. These glasses must remain loaded with weights from 15 to 20 days; then 20 days more are required to eliminate the superabundance of mercury, and three months more are required before they are salable; not to mention all the precautions that have to be taken at every moment in the shipping and setting in frame. Mr. Dodé & Faure are able to platinize a surface of 800 meters a day, with only the aid of a few hands, as one workmen is able to platinize 50 meters of glass in 12 hours' work.

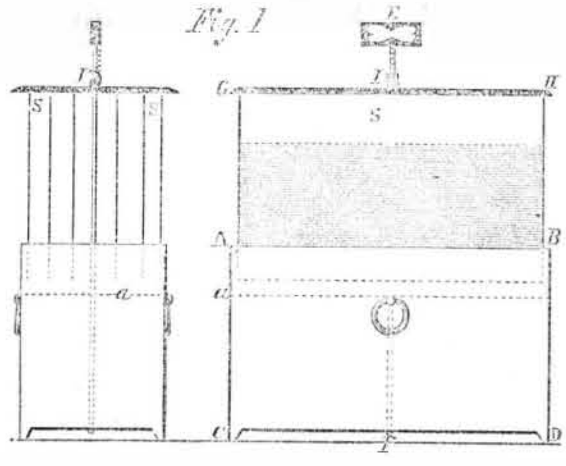
TO SOFTEN PUTTY AND REMOVE PAINT.—To destroy paint on old doors, etc., and to soften putty in window frames, so that the glass may be taken out without breakage or cutting, take 1 lb. of American pearlash, 3 lbs. of quick stone lime, slack the lime in water, then add the pearlash, and make the whole about the consistence of paint. Apply it to both sides of the glass, and let it remain for twelve hours, when the putty will be so softened that the glass may be taken out of the frame without being cut, and with the greatest facility. To destroy paint lay the above over the whole body of the work which is required to be cleaned with an old brush (as it will spoil a new one), let it remain for twelve or fourteen hours, when the paint can be easily scraped off. This recipe has been used by a tradesman. a painter and glazier by trade, for years.

[For the Scientific American.]

APPARATUS FOR PURIFYING THE AIR BY THE EVAPORATION OF COAL TAR, PITCH, CARBOLIC ACID, PHENIC ACID, OR ANY OTHER DISINFECTANT FOR APARTMENTS, OR HOSPITALS.

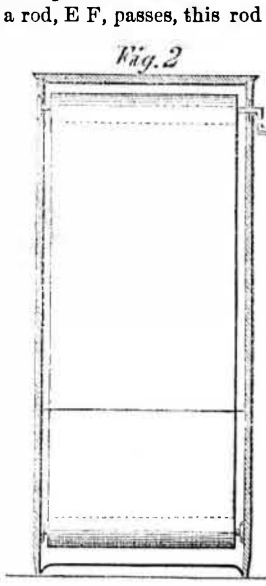
BY C. WIDEMANN.

This apparatus consists of a zinc box, A B, C D, into



which the liquid to be evaporated is poured, until it reaches a, a.. In the middle of the box a rod, E F, passes, this rod is provided at its upper end with notches. A cover, G H, provided with blades, S, S, slides down the rod, E F, and can be fixed in any desired position by a hook spring, I, engaging with the notches of said rod.

Fig. 2

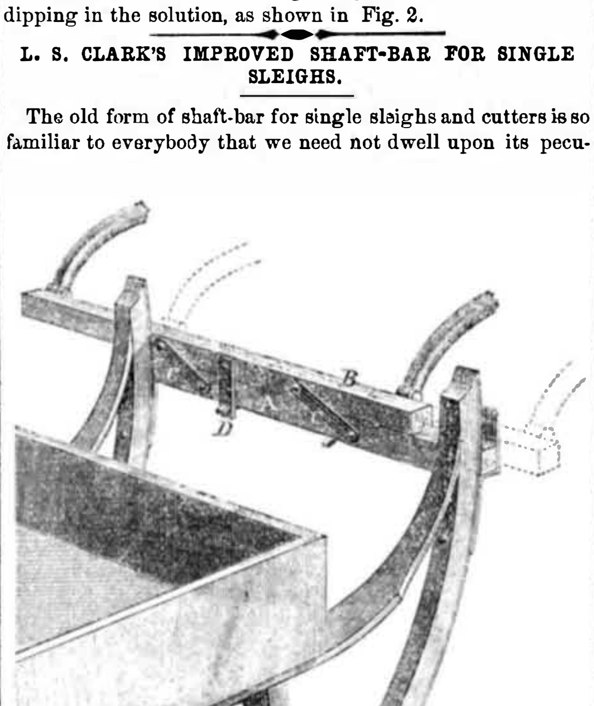


These blades having been dipped in the solution, are raised by sliding them along with the cover, and the air passing through them is saturated with the disinfecting agent. As soon as these blades begin to dry, they are re-dipped in the liquid, and raised as above described—Fig. 1.

This apparatus is very simple, and can be made of wood, tin, or any suitable metal. For hospitals the apparatus is a little modified, as more evaporating surface is required. It consists in an endless cloth passing over two rollers, and dipping in the solution, as shown in Fig. 2.

L. S. CLARK'S IMPROVED SHAFT-BAR FOR SINGLE SLEIGHS.

The old form of shaft-bar for single sleighs and cutters is so familiar to everybody that we need not dwell upon its peculiarities.



It provided a means whereby a single horse might travel in the right hand track made by a double team, but whenever it was desired to place the horse directly in front of the sleigh, it was found necessary to have a second pair of attachments. To make the change occupied some time, and required frequently the use of a hammer and wrench to effect it.

The device we herewith illustrate provides a means whereby this change can be effected in an instant of time without tools, and without even taking the horse out of the shafts.

The shaft-bar is double; one portion, A, being permanently fixed to the runners of the sleigh, and the other portion, B, being connected by two bars, C, with A. The bars, C, are pivoted to both A and B. When the horse is desired to travel in the right-hand track, the bar, B, is placed in the position shown, and locked at the fixed bar, A, by the spring latch-bar, D.

When it is desired to have the horse travel directly in front of the middle of the sleigh, all that is necessary is to release D, and throw B over so that it occupies the position shown by the dotted outline, and fasten it there by the latch, D. The change is effected by the hands alone, and scarcely three seconds are necessary to make it.

Patented, through the Scientific American Patent Agency, February 8, 1870, by L. S. Clark, of Bethel, Conn. For town, county, or State rights, address G. M. Lyon & Co., Bethel, Conn.

Correspondence.

The Editors are not responsible for the Opinions expressed by their Correspondents.

Inertia---Vis Inertiæ---What are They?

MESSRS. EDITORS:—In a late work, entitled "Force and nature," it is strenuously denied that there is any such thing as inertia in matter. The author bases this denial simply upon the alleged fact, that all matter is in motion; showing that he conceives inertia to be something that pertains only to matter at rest. He is evidently one of those amateur philosophers who enter the temple of science through its third or fourth-story windows, and never take the trouble to descend and examine its foundations, its axioms and definitions; yet he thinks himself competent to demolish the entire fabric and reconstruct it on a new plan, simply because he has traveled much, and seen a great many volcanoes and earthquakes. As the book is destined to early oblivion, it would be unnecessary to notice its error concerning inertia were this error to be found only in its pages; but similar views of inertia have been expressed in the SCIENTIFIC AMERICAN, a publication which is rarely at fault on questions of physical science, and to which thousands look with well-placed confidence for sound advice and instruction on this and other subjects. Errors in such a publication are the more likely to mislead, because they are of rare occurrence.

On pages 217 and 297, Vol. XX., the term inertia is objected to as having received various definitions: as being negative, indefinite, and uncertain in its meaning, and, therefore, liable to mislead; and it is alleged, that there is no occasion for its further use, since it had its origin in "notions of force which are now obsolete."

To the assertion that there is no such thing as inertia in matter, an appropriate reply would be that which the Romans were accustomed to make to absurd propositions: *Nil intra in pruno, nil extra in nuce duri!* "You might as well tell me that prunes have no stones, and nuts have no shells!"

That there is in matter a property which makes it necessary to employ force to impart motion to it, or to increase, diminish, or change the direction of a motion already imparted, is a fact, as well known to us as that prunes have stones, or that nuts have shells; as well known, indeed, as the existence of matter itself; for it is one of the chief characteristics whereby we recognize the existence of matter as a substantive entity. This is the property to which physicists have given the name of inertia. It is not a negative but a positive property, pertaining alike to all matter irrespective of the question whether it be in motion or at rest.

This property of matter was recognized, and received its name, prior to the time of Newton. Newton recognized it and accepted the name, declaring it to be well chosen, as happily indicating the nature of the property; and under this name he made inertia one of the fundamental axioms of his system of physics in the Principia. It is no more possible to construct an inductive system of physics without recognizing this property of matter as a fundamental axiom, than to construct such a system without recognizing the property of gravitation; indeed, to ignore the one, is to ignore the other; for the force of gravitation can have no influence upon matter which offers no resistance. The functions of the two, like action and reaction, are necessary correlatives, inseparable even in thought.

It is true that many definitions have been given of inertia; but this fact does not imply that there is any difference of opinion among physicists as to the nature of the thing defined. A property of matter can only be defined by reference to its modes of manifestation. The property of inertia manifests itself in various ways, thus admitting of as many definitions; but these different modes of manifestation are so correlated that each necessarily implies all the others, so that a definition founded upon any one of these, points us directly to that which is the common cause of all of them, and sufficiently characterizes it for all the purposes of a definition. The following, however, is perhaps a more complete definition of inertia, inasmuch as it is founded upon a feature which is common to all of its modes of manifestation.

INERTIA is that property of matter whereby it offers resistance to the action of any force which imparts motion to it, or which increases, diminishes, or changes the direction of a motion already imparted.

VIS INERTIÆ is the resistance thus offered, viewed with reference to some standard of measurement that comports with its nature as a magnitude.

We see, then, the difference between inertia and vis inertiæ: the first is the property of matter which causes its resistance to changes of motion; the second is the resistance itself considered as a measurable quantity. The "notions of force," entertained by those who recognized inertia as a property of matter and gave it its name, and which are alleged to have become obsolete, were the same as those entertained by Newton, and upon which he constructed his system of physics. He employed the term force to denote a simple quantity, expressible by the single algebraic symbol F, having but one dimension, and referable to simple gravity as its standard of measurement. He did not give that name to the products of of F by other quantities, as by time, F t, or by space, F s; nor to what has been called "the force of a moving body," meaning its power to produce effects during the extinction of its motion; a power which is proportional to the product of its mass and velocity, M v, when the effect to be produced is the extinction or production of motion in other matter, and to M v^2, when the effect contemplated is such as belongs to the department of terrestrial mechanics. Subsequent writers have used the term force not only to denote that which Newton expressed by F, but also to denote all those other varied and complex quantities totally differing from F, and from each other in their natures as magnitudes. It is this abuse of the term force which has led to all the confusion and error complained of in the articles referred to: and we shall not escape from this "slough of metaphysics" by adding another to the things miscalled force, as is proposed in the proposition "force is motion and motion is force." The true way of escape is to go back to the employment of the term to signify nothing but F,—force pure and simple.

It has been supposed by some, who perhaps have given little thought to the subject, that the theory of Tyndall, and other philosophers, in regard to the convertibility of force into various modes of molecular motion, causing, as they allege, the different phenomena of heat, electricity, etc., and the re-convertibility of these into force, is destined to change all our previous notions of force, and even of the nature of matter itself. It was, perhaps, in view of this theory, and of the attention which has been drawn to it, that the old "notions of force" are alleged to have become obsolete. There could be no greater mistake than this. These philosophers themselves take no such view of the bearing of their theory, but regard it as tending only to extend, not to subvert the Newtonian philosophy. They suppose their molecular motions to be produced, and changed from one "mode of motion" to another, by force, acting upon the inertia of the molecules in perfect accordance with, and obedience to the laws of motion, as laid down by Newton.

This theory of molecular motions is purely speculative, and may or may not be true. It owes the attention which it has attracted, more to the reputation of its authors, and to the enthusiasm and persistency with which it has been urged, than to the force of the facts to which they appeal for its support, or to any intrinsic probability of its truth. When those adventitious supports are withdrawn, and the theory is left to stand upon its own merits, it may become obsolete; but Newton's "notions of force" and inertia, being simple conceptions of facts and truths of nature as they actually exist, can never become obsolete while any sound philosophy remains, nor until truth itself becomes obsolete. ELI W. BLAKE.

New Haven, Conn.

Dying Wool Green---An Invention Wanted.

MESSRS. EDITORS:—I find an article on aniline green, on page 121, current volume, of the SCIENTIFIC AMERICAN, and as I am a practical dyer I feel an interest in these matters. I, therefore, take the liberty to address you on the subject.

Inclosed please find a few samples of iodine green on wool and cotton. The wool was boiled for two hours.

I find that the best way is to ascertain the nature of a new article, then proceed accordingly. The color is not injured by boiling, if no silicate of soda is used. We ought in coloring always, if we can, to use such substances as will not be affected in contact with the chemical influence of light. Any soda combination and the neutralization thereof with sulphuric acid does not accomplish this end. I find that tin oxide has more affinity for oxygen and is better adapted to secure permanency of the color, and not using any combinations of soda the color will not be destroyed by heat, and consequently the wool will be thoroughly colored through.

Professor Hofmann and Dr. Reimann have done great things in aniline dyeing, but it must be admitted that those practical chemists only peep, for want of time, into practical dyeing, while we practical dyers have only time to peep into the beautiful science of chemistry. I wrote a work, now out, on practical dyeing, a circular of which I inclose for your kind perusal.

Apropos, as I am now writing, I might mention that my brother writes me from Minnesota that after thrashing time "the heavens will be lighted up by fires of burning straw," the ashes of which give a universal fertilizer. But he says the straw plowed in keeps the land stronger for raising crops. I advised him to wet it with ammonia water and heap it up, as its length is objectionable to plowing, then it would rot and crumble. He replied that a straw cutter attached to the thrasher to cut the straw fine in one operation would be profitable to an inventor, and beneficial to the farmers of that and other sections. E. C. HASERICK.

Lake Village, N. H.]

[The specimens of green sent us are certainly very fine.—EDS.

Soft Solder and Silver Solder for Jewelers' Use.

MESSRS. EDITORS:—In your issue of February 26, current volume, you give a recipe for soft solder. Lead and tin equal parts. A stronger, easier flowing, and whiter solder for jewelers' use is composed of lead one part and tin two parts. When the lead is melted put in the tin and then throw in a small piece of resin as a flux.

In soldering fine work wet the parts to be joined with muriatic acid in which as much zinc has been dissolved as the acid will take up. It is cleaner than the old method of using Venice turpentine or resin.

The best method of making silver solder may be useful to some of your readers—young mechanics especially who have not obtained the information during their apprenticeship. Put into a clean crucible pure silver two parts, clean brass one part, with a small piece of borax. Melt and pour into ingot. Formerly I used to return the solder to the crucible for a second melting, but it is not necessary. The solder flows easily and clean.

Solder made from coin, as it frequently is, often melts with difficulty, and remains lumpy around the joints requiring the use of the file to remove it, while the addition of any of the inferior metals to the solder causes it to eat into the article joined by it. ALEX. ALLAN.

New York city

Cheap Cotton Presses.

MESSRS. EDITORS:—I have noticed, with much interest, in your issues of January 1st and February 12th, some remarks concerning cotton presses.

I am of opinion that both correspondents are laboring under mistaken notions concerning the real wants of the planter. I believe it to be impracticable to construct a baling press that will be cheap and as powerful as would be required to bring cotton to a density of forty pounds per foot. Admitting it could be done, there are two great obstacles to be overcome, which I am of the opinion the combined efforts of all the press builders could not surmount.

1st. The planter in the Mississippi Valley pays freight per bale, and not by the 100 pounds, and the cry is for presses of greater capacity, instead of a reduction as advocated.

2d. Purchasing agents receive orders from home and foreign speculators and manufacturers, to buy a quantity of cotton of a certain grade; to do so, every bale must be sampled in order to know whether they are obtaining the quality of cotton required.

It is laborious to force the sampling auger into a bale with a density of ten or fifteen pounds per foot. Imagine the "knights" of the auger trying to penetrate the heart of a bale of cotton at two, three, or four places with a density of forty pounds per cubic foot to ascertain if it is exactly what he is looking for. He could produce a similar effect on a pine log when seasoned, or a better one, perhaps, as it is of less density than forty pounds per foot.

When manufacturers and speculators agree to purchase cotton without sampling, and steamboats carry by weight, then it may do to compress on the farm, providing a cheap press can be invented to do the compressing to the satisfaction of the planter.

It is asserted that manufacturers would receive their cotton in better order. Admitting this to be so, they are certainly laboring under a great disadvantage by not knowing the quality of a single bale of cotton in their storehouse, provided such an arrangement were perfected. As it is now, they receive the cotton sampled, classed, and marked; by the marks and classifications any grade can be selected readily. Not so, if compressed on the farm, and sold regardless of samples, which must be the case if compressed. I have ascertained by actual measurement that the average size of bales are about thirty-five cubic feet, and as the average weight is less than five hundred pounds the density is less than fourteen pounds. Compressed cotton will average about eighteen feet after expansion, and about twenty-eight pounds per cubic foot. Now if some inventive genius can construct a very cheap press that will handle two or three hundred bales per day, and bring them to a density of forty pounds per foot, I have no doubt but he could do a flourishing business in seaports in opposition to hydrostatic and steam presses.

Memphis, Tenn. E. L. MORSE.

Value of the "Scientific American"---Portable Saw Mills.

MESSRS. EDITORS:—Allow me to express my sincere thanks for your generous advice and prompt manner in obtaining a patent for my concrete pavement.

I am and have been a constant subscriber for your valuable journal since 1865, and expect to be as long as I live. I frequently find one single paragraph in it that repays me for a whole year's subscription. I especially remember one in regard to setting boilers. I have a tubular boiler that was more expense than profit to me until I learned the proper way to set it; and I am sure, in the article referred to, the information has paid me more than the price of a dozen years' subscriptions.

I notice in No. 8, current volume, that one of your correspondents, who signs his name C. E. Grandy, has discovered a new way to burn green wood, and has sawed 10,000 feet of lumber in nine and a half hours with a 20-horse power engine.

I think his plan in burning wood for fuel is excellent, but I think the above amount of lumber is a great deal to saw with a 20-horse power.

I will not dispute his word, but I have built a number of mills and I never could make them saw so much. The only one I tried was a 12-horse power; the belt ran direct from the crank-shaft pulley to the saw arbor; circular saw 46-inch; speed 600 per minute; with all the modern improvements, and the most I could saw was 2,500 feet, ⅞ boards, from white wood logs. HIRAM M. CONKLIN.

Carlstadt, N. J.

Construction of Portable Boilers.

MESSRS. EDITORS:—I am a practical boiler maker of over thirty years' experience, and as such I feel safe in answering C. E. Grandy's question in your issue of the 19th February.

The fire will not injure the rivets providing the boiler is kept clear of deposits, and the true way to arrive at this very desirable result is to pump up the boiler to the upper gage once a day, and blow out with a full head of steam to the middle gage (there should be at least three gages attached to all boilers). Mr. Grandy had recourse to a very ingenious device in alteration of furnace, but this would not be at all necessary if the boiler possessed proper proportions. The grate surface being so small (26 by 36 in.) and the furnace so low (26 in.) the heat from fuel passed into the tubes in form of smoke, and having no chance to expand, passed out of smoke stack in same condition; now having his furnace built in brick work beneath the boiler, his original furnace answers as a combustion chamber, where the smoke ignites into a clear flame, and hence the result; but the great primary cause of this trouble lay in the boiler not being of sufficient capacity to do his work.

It would be much more satisfactory (at least to me) if he had given the diameter of cylinder, speed of engine, etc., than to state that his engine was 20-horse power. Herein lies the great mistake of many manufacturers of steam engines, particularly of the portable kind, they do not give sufficient boiler to generate the necessary amount of steam except by the use of the very best fuel. Now I will give you what I consider the right proportion of a 20-H. P. portable boiler: Steam cylinder, 10 in. diameter; stroke, 18 in.; speed 120 revolutions per minute; boiler furnace 52 in. long, 38 in. wide, 40 in. high; 88 tubes 2 in. diameter by 7 feet long. Thus you will perceive that this boiler is as it should be, large enough to supply the engine with steam with green sawdust and slabs as fuel, running a 54-in. saw, and in many instances a shingle mill; and each boiler tested before leaving the boiler department at least 160 pounds hydrostatic pressure.

I am a constant reader of your valuable paper; it is of infinite value to me. I consider it worth more than all the story trash of your city put together. It makes my blood run cold when I read in your paper of so many explosions of steam boilers—at least one half caused by misconstruction of new, and improper care and repairs of old boilers.

PATRICK QUINN.

South New Market, N. H.

Dangerous Stoves.

MESSRS. EDITORS:—Permit me to address you upon a subject fraught with interest to all who use *stoves*, as one of the victims of one of the vilest annoyances and dangers incident to civilized domestic life. I allude to those most provoking and dangerous things—as much to be dreaded and shunned as an ignited bomb-shell, or an "infernal machine"—stoves made with *insecure "feet,"* legs or supports; with these indispensable appendages pretended to be fastened (?) to the stove, or provided with a means of attachment in setting it up in its place.

It sounds very amusing, sometimes, to read or hear descriptions of the "miseries" of stove and pipe placing, fitting, and adjusting, under the head of "Putting up Stoves," but there is quite another and more serious point of view of the whole subject. After many a most vexatious experience with stoves ill fitted and ill furnished with feet, the following occurrence recently took place in the writer's own family. An "air tight," wood-consuming stove, connected with a long range of pipe, and a large "drum" in an upper room, was well supplied with fuel, and contained a glowing fire. One of its feet was discovered to have *fallen* out, by a little child who happened to be alone in the room at the time. The child, fearing the stove would fall over, attempted to replace the stray foot, when the stove fell over with a crash, endangering the life of the child, and scattering pipe, ashes, fire, and danger in all directions over the carpeted floor, besides consternation all over the house, and breaking the stove. It was a narrow escape from a serious calamity, but it was at the same time excessively alarming and troublesome, calling for much labor in two stories of the house.

Is there no simple, and at the same time effectual mode, not only of attaching, but of securely *fastening* the feet of stoves *to* the stove, as to form part and parcel of it, whether standing, or when moved from place to place, instead of the miserable tapering "dove-tail" insertion so commonly in use for stoves of all sizes and descriptions? And should it not be classed among the "catalogue of crimes," for stove makers to make and sell stoves with a "make believe" appendage at the bottom, which will be either so loose as to fall out of its place from its own weight or a slight jar, or so tight as only to go half way in?

Is there not in existence, in some available shape, the desideratum above alluded to? If so, your correspondent would be pleased to be informed what it is like, and also why it is not in general use among founders? If there is such a thing, why, in the name of common sense and common safety, do we not have the benefit of it accordingly, as well as of the thousands of inventions of minor importance? And why should stove makers not be compelled to provide for safety in this respect, as well as those using steam engines to see to the safety of their boilers? *

A Suggestion to Boiler and Engine Builders.

MESSRS. EDITORS:—I have had considerable experience in the brass and machine business, and have experienced a great deal of inconvenience in the practice of the different machine shops and boiler makers in tapping holes for cylinder, gage, and pump cocks with a variety of different threads and sizes. I take this method of suggesting to the boiler and engine builders, through your valuable paper, a uniform system of size and thread by using the standard gas taps, which are suitable, and, I think, could be adopted with considerable advantage to all concerned throughout the United States.

ISAAC B. POLK.

Columbus, Ohio.

CEMENT FOR CLOSING CRACKS IN STOVES, ETC.—A useful cement for closing up cracks in stove plates, stove doors, etc., is prepared by mixing finely-pulverized iron, such as can be procured at the druggists, with liquid water-glass, to a thick paste, and then coating the cracks with it. The hotter the fire then becomes, the more does the cement melt and combine with its metallic ingredients, and the more completely will the crack become closed.

Improved Washing Machine.

This machine is designed to imitate the action of hand-rubbing, without the use of the washboard, as nearly as can be done by a mechanical device. In fact it both squeezes and forces the water through the texture to be cleansed as gently or as forcibly as desired.

It consists of a water tub or case, A, Fig. 1, of rectangular or other form, within which is placed a revolving cylinder B, Fig. 2. Around this cylinder is placed a casing, C, Fig. 2, made in segmental sections, each so arranged as to be capable of motion to or from the cylinder, and being pressed toward the cylinder by a chain pulley and weight, as shown in Fig. 2.

One of the sections is hinged, as shown in Fig. 1, and may be opened to take out or put in the articles to be washed, and when closed may be fastened so as to act in conjunction with the other sections.

The external surface of the cylinder, A, and the internal surface of the segmental casing, are grooved as shown in Fig. 2, to facilitate the carrying the clothes around between them, and to increase the sqeezing and cleansing action.

The operation of the machine is as follows: The clothes being put in by opening the hinged segment—the interior of which is so constructed that the space narrows toward the cylinder—two turns of the crank brings them under and between the cylinder, and the segmental casing, where they are squeezed and cleansed by oscillating the crank. When sufficiently cleansed, the same number of turns brings them to the hinged segment again, and they are then taken out and wrung by a wringer attached to the machine in the usual manner.

The inventor claims that this machine is superior to any machine heretofore devised, because it imitates the action of hand washing so closely; a constant squeezing being kept up by the action of the grooved surfaces. The boiling is kept up by means of a steam pipe, which conveys steam to the machine from a kettle, range boiler, or any vessel generating steam, and the washing and boiling are thus done simultaneously, the use of the washboard being entirely superseded.

It is claimed that the finest goods can be washed without injury to the fabric, and that family machines will wash from four to six shirts, or two sheets, in from two to five minutes. The steam being confined does not cause annoyance by spreading through the house.

The mechanical arrangement and construction are simple and not liable to get out of order.

Patented, through the Scientific American Patent Agency, August 24, 1869, by Jerome B. King, who may be addressed for further information, corner Horatio and West streets, New York city. Machines may be seen in operation at 71 West Broadway.

Fig. 1

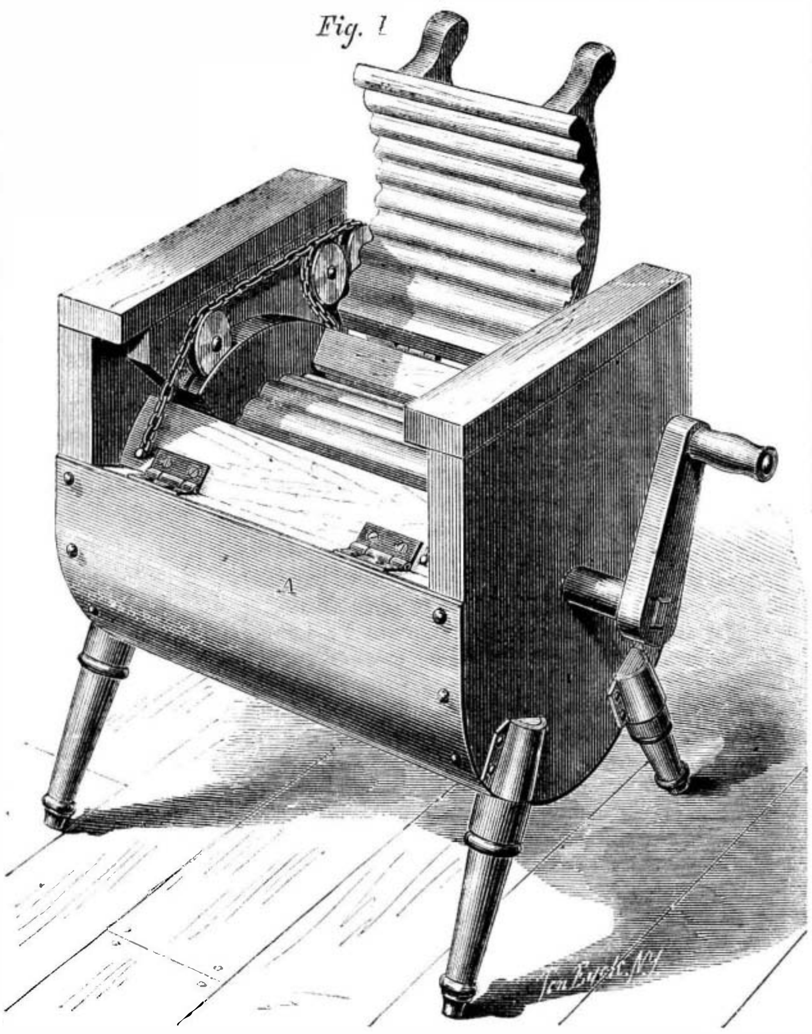
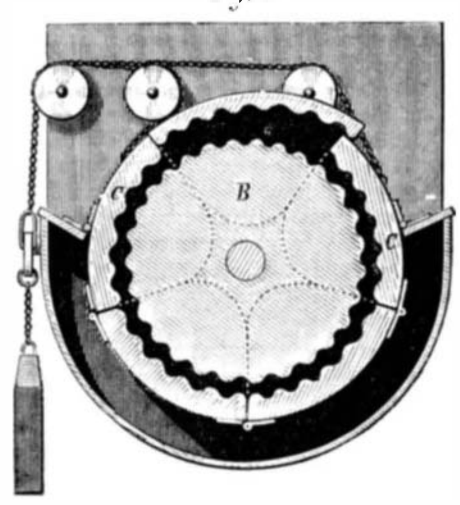


Fig. 2

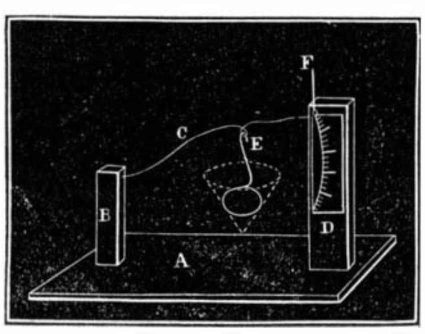


JEROME B. KING'S SELF-ADJUSTING DOUBLE WASHER.

SPRING BALANCE FOR CHEMICALS.

A contributor to the *Illustrated Photographer* writes:

"On trying some chemical experiments lately, I found that my ordinary photo scales were very uncertain with



quantities less than one or two grains. So I constructed a spring balance, which I find so very delicate and useful that I think a description of it may be of service to fellow-subscribers.

"A is a deal stand 12 by 3 inches; B is a hard wood block, firmly attached to A; C is a spring; D is an index pillar; E is a scale-holder; F is a small bent pin, to hold the spring steady while changing the scale pan.

"The spring, C, should be very fine steel wire, bent over so as to form a loop or eye near the index for E to hook into. The index is a slip of card set out with a fine pen. The scale pan is of thin letter paper; circular, and folded something like a filter paper. Indicated by the dotted line.

"I find that with it I can tell off, with the greatest accuracy, the minutest fragment of a grain.

"Or, by substituting a stouter wire, grains, on the index, read drachms or ounces."

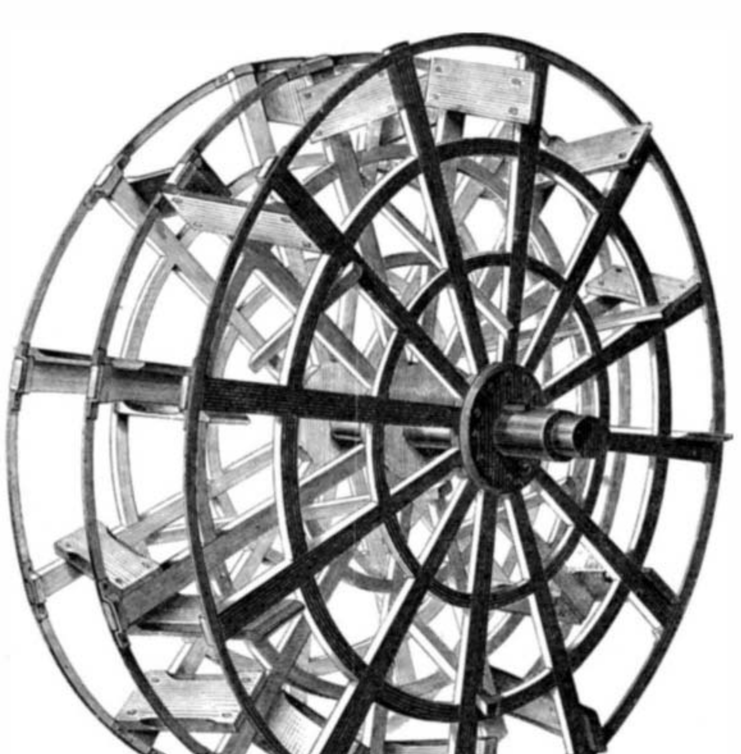
Improved Paddle Wheel.

In very rough water the paddles are exposed alternately to the extremes of being too deeply immersed, or working almost or completely out of water. In all intermediate conditions the surface is inclined constantly in various directions, and the paddles arranged in the ordinary way, strike gently or gradually, commencing at one end or the middle, and the contact with the water progressing gradually along the length of each float. But when working in smooth water, which is or ought to be the best condition for favorable working, it is found that the percussive force with which the broad surface of a long paddle strikes against the water, is not only a serious annoyance but exerts a very destructive influence on the machinery by its continuous concussions. On some of the western rivers an approaching steamboat may be heard long before she is in sight by the rapidly-recurring blows of the paddles on the water.

Some machines, built apparently like others, have peculiarities, idiosyncracies, perhaps some college professor might say, a sort of personal peculiarity which it is rather difficult to explain. A lot of locomotives made in the same shop, from the same pattern and by the same men, will not work exactly alike. Three Peck Slip ferry boats were once made in this city, as near alike throughout as skill could make them; and two steered well, and one nobody could steer with satisfaction. From the same unexplainable reasons, probably due to slight differences in materials or form, some steamers are peculiarly susceptible to the ague from the cause now referred to.

The matter attracted the attention of a practical engineer, Mr. James Mahoney, formerly the Chief Engineer of the Boston, Newport, and New York Steamboat Company, who attained a solution of the difficulty by very simple and apparently very obvious means. All paddle wheels are divided into two breadths by a central beam, that is, there are three rims or slender circles of iron, with three sets of arms extending out from the shaft thereto. The paddles are bolted to these arms. The Mahoney wheel has the buckets divided into two lengths, and placed so as to alternate in position, and each half length is placed a little oblique or inclined. It is found that the obliquity need not be very great to obviate all or nearly all the trembling. The steamer, *What Cheer*, running on Providence river and vicinity, was one in which the concussion was very severe. Her paddles were five feet eight inches long and twenty inches wide, and the wheels sixteen feet in diameter. The alteration of the paddles, according to Mr. Mahoney's plan, as is officially certified by the captain and engineer, obviated the jar, trembling, etc., fully one half, and increased the speed of the boat, giving a gain in this latter respect of five minutes in each hour with ten pounds less steam.

The steamer *Monahausett*, a larger steamer, running between New Bedford and Edgartown, with wheels twenty-six feet in diameter, paddles seven and a half feet long and twenty-two inches wide, were altered to the Mahoney plan with an entire removal of the jar or trembling and a marked increase in the speed. The average running time with the old wheels was two hours and fifty-five minutes; with the new wheels two hours and thirty-five minutes. Previous to the change the jar or trembling was unusually severe. In this case the same buckets were used, simply cut in two lengths obliquely and rebolted. On this boat the obliquity was eleven inches, that is, each bucket or half length was eleven inches further in at one end than the other. The wheel is now about being applied to the *Ironsides*, now lying at the Erie Basin, Brooklyn.



THE MAHONEY PADDLE WHEEL.

There has been an almost countless multitude of contorted and curious modifications of the paddle wheel. Some of them have approximated to this idea in various ways. Mr. Mahoney, however, whose invention is illustrated by the accompanying engraving, seems to have made a practical and successful improvement in this important adjunct of navigation. The paddles stand in their ordinary planes, and act on the water in other respects in the same manner as the long approved common paddles. They will, it is presumed, endure all the rough usage among floating lumber and ice of the ordinary wheel, and having demonstrated their efficiency as propelling means, the smoothness of their action, and their relieving the vessel and machinery from concussion, will go far to hasten their general and rapid introduction. Patented Nov. 9, 1869.

Further particulars, rights, or supervision in the application of this invention, may be had by addressing James Mahoney, Newport, R. I., P.O. Box 635, or William Burnett, Supervising Inspector of Steamboats, San Francisco, Cal.

THE New York Central Railroad, one year ago, issued a scrip dividend of eighty per cent on the capital stock of the road, and having failed to make returns to the Revenue Office, the Company was assessed by Ralph P. Lathrop, United States Assessor for the Albany district, five per cent on the dividend, the tax amounting to $1,152,000. This appears to us to be right. We see no reason why this dividend tax should not be collected the same as any other.

INCOMBUSTIBLE wicks for kerosene lamps are made in Vienna, Austria, of asbestos, which is boiled in wax. They last at least a year.