Notes and Queries

J. H. D., of Mass.—According to the census returns of 1860 the property of the people of this country was worth $16,000,000,000; the national debt, when all the bills come in, will amount to about $3,000,000,000. Consequently, to payoff the debt everybody must contribute one-fifth part of his property; this nobody is willing to do. The debt can and will be rapidly paid, but it must be done by vigorous taxation.

C. W. H., of Conn.—It has been demonstrated that a balloon cannot be navigated by muscular power. The muscular force of a man could not at the utmost cause a balloon large enough to support him in the air to deviate from the direction of the wind more than four miles in an hour.

Clarendon, of Tenn.—We have perhaps been too accommodating in republishing articles two or three times at the request of correspondents; however, we give you again Capt. Hall's cure for drunkenness: sulphate of iron, 5 grains; magnesia, 10 grains; peppermint water, 11 drachms; spirit of nutmeg, 1 drachm—twice a day.

E. S., of Ill.—Iron is galvanized, as it is improperly called, by being immersed in molten zinc. For a minute description of the process see page 243, vol. XI.

I. M., of N. Y.—A patentee is not obliged to show his patent, but you can procure a copy of it from the Patent Office.

J. M. C., of Fla.—We do not think you can purchase in this market a machine capable of sawing down standing trees. Such machines have been invented but have not proved successful so far as we can learn.

I. L. F., of R. I.—We neither buy nor sell patents, therefore must decline to purchase your horse shoe.

G. W., of Mich.—You say that a certain party has obtained a patent for an invention which you and others have publicly used for upwards of ten years, and wish to know if the patentee can now stop you from continuing to use it. We answer no; the invention is public property.

O. H. B., of Ind.—Augers to bore hard wood are made from one to two feet in length, and can be had at most tool stores in large cities. Car-makers use them.

C. H. B., of Mass.—For your small boat, 18 feet long, 4½ feet beam and 12 inch draft, you can use a screw of 12 inches diameter and 20 inches pitch. You may use a larger screw by putting the shaft as low in the boat as the crank will allow, and attaching a shoe or guard to the keel behind the screw, so that its blades will not strike in shoal water, as they would if the diameter of the screw was greater than the draft. As to the form, make it a true screw; as to the blades, use three; as to the velocity, run it as fast as you can.

P. K., of Tenn.—We are pleased to hear from you. Iron ore is so abundant that it is of no value in the bed except in favorable positions.

W. A. L., of Ohio.—Giffard's injector will work with steam at a less pressure than 40 pounds.

D. K., of N. Y.—Gun cotton is sometimes decomposed by long exposure to air and moisture, but we never heard of its burning by spontaneous combustion.

G. C. B., of Iowa.—A horse-shoe magnet weighing 1 pound has been so charged as to sustain a weight of 26¼ pounds. The attraction of magnetism passes freely and without diminution through all known substances.

R. E., of Mo.—The *London Builder* is a paper of very high character. There is no paper in this city devoted exclusively to architecture and building.

H. H., of N. J.—Dr. Trimble, the naturalist, of your city, will tell you how to catch humming birds.]

T. T., of D. C.—J. W. Stevenson's turbine gave the largest yield of power at the great competitive trial at the Philadelphia Water Works. His address is No. 100 Broadway, N. Y.

SPECIAL NOTICES.

Robert Bates, of Philadelphia, Pa., has petitioned for the extension of a patent granted to him on the 30th of September, 1851, for an improvement in instruments for the cure of stammering.

Parties wishing to oppose the above extension must appear and show cause on the 11th of September next, at 12 o'clock, M., when the petition will be heard.

Stephen P. Ruggles, Boston, Mass., has petitioned for the extension of a patent granted to him on the 23d of September, 1851, for an improvement in hand stamps.

Parties wishing to oppose the above extension must appear and show cause on the 4th day of September next, at 12 o'clock, M., when the petition will be heard.

Joseph H. Moore, Chicago, Ill., and Wm. P. Parrott, Boston, Mass., have petitioned for the extension of a patent granted to them on the 2d day of December, 1851, for an improvement in steam carriages for railways.

Parties wishing to oppose the above extension must appear and show cause on the 20th day of November next, at 12 o'clock, M., when the petition will be heard.

Correspondence

Copper Cartridges in Cold Weather.

MESSRS. EDITORS:—My communication in regard to the effect of severe cold upon copper cartridges has naturally excited a good deal of attention, and a considerable amount of testimony, verbal and written, has reached me since its publication. I have regretted that my correspondents did not send their communications directly to you, and have waited in the hope that your columns would contain further evidence than the letters of Messrs. Plaisted and Perry, which thus far are the only published replies I have seen, and both of which are simply negative and prove nothing. Mr. Perry's testimony has rather a formidable look in consideration of the great number of cartridges he has fired, but its weight is destroyed by the fact that the ammunition was kept and fired under cover, being used in proving Spencer rifles. Mr. Plaisted has fired from one to two thousand cartridges, has had but two miss-fires, and is convinced neither of them was owing to cold. Very few men have been equally fortunate, I cannot tell how many thousands I have fired and seen fired, but I am sure the proportion of misses has been very much larger than his, though it never occurred to me at the time to attribute them to cold weather. I always turn a cartridge when it misses, and try again, sometimes with a successful result, oftener not.

By the kindness of Major Laidley, I have been furnished with a carefully-prepared report of an experiment which has been tried at the Springfield Armory, for the purpose of testing the question, and which seems clearly to prove that the cartridges are not affected by cold. A quantity of cartridges were placed in a refrigerator from which they were taken and fired at different times, none being less than an hour, and the greater portion forty-four hours in the freezer, exposed to degrees of cold varying from 30° above to 2° below zero. Five hundred and twelve cartridges were thus fired without a single miss, and Mr. Porter (the foreman by whom the report was prepared), says in conclusion, "I could see no difference between those which had been in the freezer the greatest length of time and those that had not been in at all."

This testimony would seem to be conclusive against the opinion I advanced in my former communication, which, it will be remembered, was based upon what I had learned from others. On the other hand I have the assertions of perfectly reliable men—two of whom are scientific men—as well as sportsmen, that they find these cartridges so unreliable in severe cold weather in Canada and Michigan, though taken from the some lots, which prove perfectly reliable in summer, that, as one of my correspondents says, "I have had to lay them aside as useless and should not think of taking them on any future winter expedition." He adds, moreover, "But almost invariably, on warming those which had missed, in the hand or pocket they have exploded." I have verbal and written testimony to the above effect from different sources entirely unknown to each other, and whose interests would certainly prompt them to make the best of the only ammunition they could use in the guns with which they had provided themselves. I cannot withhold my belief from their testimony, and I can only express the hope that we may have further light upon the subject which will enable us to decide a question which is certainly a very important one.

H. W. S. CLEVELAND.

Danvers, Mass., June 7, 1865.

The Perpetual-motion Clock.

MESSRS. EDITORS:—Your New Zealand and also Harrisburg, Pa., correspondents are both mistaken in assuming the so-called perpetual-motion clock described by them to be "new to all the world." My father, Col., S. Boon, of Hamilton, Madison Co., N. Y., in the year, 1842, invented and constructed a clock operating upon similar principles, viz., the expansion of fluids made upon the same principle as a thermometer. A large sphere was the receiver into which was placed a metallic cylinder; a piston was placed in the cylinder; upon the cross-head of the piston rod was attached a double rack with suitable guides to keep the piston rod straight with the cylinder. Upon the cross-head were also placed weights of 25 lbs. each. He filled the ball or sphere with oil, which kept every thing lubricated, and obtained the power necessary to wind the clock by the contraction and expansion of the fluid. The weights carried down the piston rod and the expansion carried it up—winding the clock both by expansion and gravitation, by means of racks and ratchet wheels. The clock wound from the center of the spring, on the same principle that American watches are now made. It is unnecessary to explain further.

I would simply say that it was examined by many prominent gentlemen, and to satisfy the incredulous that it was wholly destitute of deception, we obtained certificates from Dr. Nott, Prof. Silliman, Prof. Finney and many others, who witnessed its operations and pronounced it unlimited in its power, excepting in strength of machinery, and would continue to run without aid from man as long as the material of which it was composed would last. It was on exhibition at the American Institute, in New York city, in 1843. I have many portions of it now in my possession, which I can exhibit to any inquirer.

ALONZO Z. BOON.

Galesburg, Ill., July 1, 1865.

The Government Flying Machine.

MESSRS. EDITORS:—In looking over your valuable journal I saw a statement concerning a new flying machine, in process of construction at Hoboken, to be propelled vertically and horizontally through the air by screw fans; propelled by a steam engine placed in a cigar-shaped car with one fan above and one below the car and one at each end. Now the thing looks very squally to me. How can they give a rotary motion to the lifting fan without causing the car to rotate in the opposite direction without having a fan to act against it? If the rear fan was left off, the front fan falling through the air would prevent it more or less, but not sufficiently, and the lower fan would have a tendency to equalize the thing. It looks to me as though the motion would be more like a Boomarong than anything I know of. If the propelling power was communicated from the earth, as Prof. Mitchel's experiments were, it would look more plausible; for then the engine would have a solid foundation, or a momentum given to it before it started independent of itself like the child's toy.

S. D. ENGLE.

Hazleton, July 1, 1865.

Water Wheels by Night and Day.

MESSRS. EDITORS:—In your issue of the 1st inst., I see some remarks on the mysterious effects of water on wheels, in the day time and in the night. I also see you infer from the communication from the Cumberland Valley Mills, that the mystery is only imaginary. Years ago I was placed in positions so that the fact exhibited itself to me. On investigation I found that a sluice or opening for the water to pass through in the day time would be 10 inches wide, while in the evening the opening would be 9 inches to give the same motion by the usual kind of governor and running the same machinery. On following up the investigation it was discovered that the contraction commenced, in clear weather, two or three hours before the sun set and continued until midnight, then remained until day light without change, then commenced to enlarge and continued until noon; then no change until two or three hours before sundown. In clear weather there is not so much change experienced. The philosophy my mind has settled down upon is that the sun's rays rarify the air in the day time thereby changing the center of attraction of the earth so that the same column of water would require a larger capacity to pass through while the sun is on the horizon than when not on the horizon. The results are as above related, the philosophy is my individual opinion only, as nothing has come under my observation giving me any light on the subject. I should be pleased to see an explanation of the laws by which the phenemenon is produced.

ANDREW R. ARNOLD.

Newark, N. J., July 5, 1865.

[We publish this communication out of respect for the writer, who is a remarkably skillful and successful manufacturer; but the account of the observations is not sufficiently detailed and definite to give us a particle of confidence in the conclusions. We

can see that with several kinds of wheels and gates in practical nse the variations might all have resulted from changes of flow of water in the stream. Let everything be carefully weighed, measured and counted as it was by our Pepperell correspondent.—EDS.

Water Wheels and Belts.

MESSRS. EDITORS:—I see a correspondent is troubled with a mystery about water wheels going more quickly by night than by day. A wheel will go quicker by night than by day, if the night is a good deal colder than the day. The fact is that water contracts in cooling down to 39° Fah.; consequently becomes heavier, bulk for bulk; or in other words, the specific gravity is increased, the water gage and every thing else remaining the same, the wheel will go quicker with the cold water.

On the subject of belts, I think Mr. Cooper's rule—66⅔ square feet per minute per horse power—a very good one. I lately put up one 12 inches wide, with a velocity of 800 feet per minute, to drive a pair of wheat burrs, 54 inches diameter, 140 turns per minute. I calculate the power at 12-horse. The belt works beautifully. Divide 800 by 12, and the result is 66⅔ per horse-power. This belt had a tightner pressure, as near as I can calculate, of 400 pounds, which would be a pressure of 33⅓ per horse-power. The belt runs horizontally. We used to put on a 10-inch belt on an 80-foot fly-wheel on engines which we sold for 12-horse power. This belt would have a velocity of 1,000 lineal feet per minute, which you see comes very near Mr. Cooper's rule—66⅔ per horse-power. But this subject will never be definitely fixed till some one makes experiments with winding up weights, etc., for which perhaps some of your many correspondents may have time and machinery. J. W. H.

Wilmington, Del., July 5, 1865.

[The suggestion that the condensation of water by the reduction of temperature might cause a wheel to run faster in the night than in the day is perfectly sound. The effect, however, would be scarcely perceptible except by means of very delicate instruments. Large bodies of water are cooled or warmed very slowly, and the change of temperature from day to night would probably seldom be more than two or three degrees. If the change was ten degrees, 10,002 cubic feet of water at 50° would become 10,000 cubic feet at 40°, making a difference of one-fiftieth part of one per cent.—EDS.

Further Queries About Belts.

MESSRS. EDITORS:—I notice in your columns some discussions in regard to the power of belt, rules for determining it, etc.

Now there is a question connected with belting that I would like to have solved. It is this:—Given certain sized pullies and belt; must we double the width of those pulleys and belt at same speed, to get double the power? It seems to me in practice that a 12-inch belt, under the same circumstances will transmit more than double the power of a six-inch belt, and yet I can give no particular reason for it; perhaps some of your mechanical correspondents can give light on the subject.

Lambertville, N. J., July 1, 1865.

Th Most Rational Explanation Yet of the Ball and Jet.

MESSRS. EDITORS:—In the correspondence of your last number I see a query and remarks upon the subject of a ball balanced upon a fluid jet; and it offers a striking comment on your recent remarks upon "observation," that this correspondent states an observed fact connected with the subject which at once refers it to a large list of common-place phenomena, alongside, indeed, with all that interesting class of appearances which grow from the disposition of rotating bodies to preserve the plane of their rotation. The fact once ceing known that the ball always exhibits a violent rotation in some plane, the retention of its position will no longer surprise those who are familiar with the feat of mountebanks in balancing large numbers of earthen plates upon the ends of sticks at such degrees of inclination that they will fall in an instant if they cease their revolutions. But the common top or teetotum and rotascope or gyrascope are still more familiar instances of the ease of balancing a rotating body upon a point of support out of line with a perpindicular let fall from its center of gravity. The manner in which it is known a power acting upon a revolving body apparently neutralizes its own effect will show how the impinging jet would have but little power of displacement, unless it act in such a direction as to throw the ball aside without changing the plane of its rotation. Of course, I do not offer this as exhaustive, but merely as containing the germ of a probably true solution. ISAAC E. CRAIG.

Cleveland, July 10, 1865.

Attaching Labels to Tin.

MESSRS. EDITORS:—Mr. Leffien desires me to thank you for your perseverance in his patent case, and to assure yon that in any other case he may have he shall apply to you for assistance.

While I am writing, I will you give a receipt for publication which at one time was a great want with me. It is for putting labels on tin with common paste. Whitewash of common lime will do it, and not tarnish the tin. Wash the tin, and when dry wipe it clean; the label will then stick as well as on wood. The manufacturer can wash the tin in sheets, as I did, but must be careful to put the washed side out in making up. As you publish information for the people, you can, if you wish, put this in shape. At one time I would have been willing to give $50 for it.

GEO. T. JOHNSON.

Marshall, Henry Co., Iowa, June 26, 1865.

[It is also said that labels will adhere with common paste if the can be washed first with strong vinegar.—EDS.

Improved Method of Setting Splinters for Diamond Drills.

MESSRS. EDITORS:—Having had occasion to use diamond drills for perforating porcelain, in experimenting toward a new method of restoring defective crowns of natural teeth, I ordered this instrument from a New York lapidary, who informed me that there was always a degree of uncertainty about the point remaining firm. I experienced this difficulty before I had drilled a single hole with a ¾ line drill. I reset this splinter in the following manner: Having prepared the pieces in the usual way, I sunk a triangular recess in the smaller piece, using for this purpose an obtuse drill and an engraver's flat burin. The usual offset was filed in the other half, but with the shoulder cut under with a three-square file, corresponding with the bevel of the splinter. The space was adjusted so that the splinter held the pieces slightly apart. The parts, with the point in place, were next attached with soft solder, and two small holes were drilled through the rod, one about a line from the splinter and the other near the end of the smaller piece. These holes being tapered with a broach, and fitted with soft steel pins, the soft solder was scraped off and the two pieces brought to a spring temper, and then riveted together.

I have used this drill considerably, and it is perfectly firm. By tempering the setting and riveting together, two important advantages are gained—hardness, with additional tenacity, and tension. These objects are defeated by using silver solder in making drills. GAM'L JACKSON.

Winona, Minn.

Destruction of Bolting Cloths by Insects.

MESSRS. EDITORS:—Would you have the kindness to ask some inventive genius to make a machine or some contrivance to prevent the bugs from eating holes through the bolting cloth in flouring mills. The machine must be constructed so as to keep them from the inside and outside. No miller would hesitate to pay a handsome sum for an effectual preventative. As it is now, it is a great annoyance and expense; constantly repairing and patching is the order of the day through the summer season.

JOHN H. TEAHL.

Cumberland Valley Mills, June 29, 1865.

Work on the Pacific Railroad.

The *Stars and Stripes*, a paper published at Auburn, California, gives the following account of the rapid progress of the Pacific Railroad through the Sierra Nevada mountains:—

The Pacific Railroad is now being constructed through this county with a rapidity almost unparalleled in the history of railroad building. The hills are being cut down, vallies filled up, bridges erected, and all kinds of railroad work going on as fast as 2500 able-bodied men, with a full complement of teams can do it. It is astonishing to see how much such a force, when directed by able and skillful superintendents, and the appliances of modern engineering can accomplish. We had hardly began to realize that the work had commenced cast of Newcastle, before the steam horse was snorting on the hill tops at Clipper Cap, in the heart of the mountains, 43 miles from Sacramento and 1800 feet above the sea. Soon his shrill whistle will be heard at Illinoistown. We learn that the directors have fixed September 1st for that event, and if it can be accomplished in that time it is sure to be done. The work is heavy, but the force is strong and the zeal is irrepressible.

Our citizens now fully realize that the Pacific Railroad is becoming a fixed fact, and not many years will elapse before the completion of this gigantic work will be celebrated, and what a celebration it will be. A continuance of the energy now displayed will soon carry the road over the mountains, and then for a rapid race for Salt Lake. The heavy work on the line west of Salt Lake, is right here in Placer county, and is now being vigorously attacked by the company. We never imagined the work would be so heavy, or that it could be completed so rapidly.

One of the most interesting excursions that can be made by sight seers, is a trip on the railroad line from Clipper Gap to Illinoistown. The cuttings are all in rock of greater or less hardness, and the boom of the powder blast is continually heard—frowning embankments rise as if by magic—high trestle bridges spring up in a week. Let those who are skeptical about the construction of the work visit that portion of the road and their eyes will be opened.

Persons who have never seen the line before the work commenced, or while it is in progress, can form no correct idea of the immense amount of labor required to construct the railroad over the mountains. But the company do their work well, and when finished it will be one of the greatest feats of railroad engineering in the world. Ten, yes twenty miles of valley road can be made as easily as one of this mountain line. Everything about the road is of the most substantial character. Travelers state that it is not excelled by any railroad in the Atlantic States. For one we are proud of this movement of California enterprise.

Mode of Rendering Wood Plastic.

A new and very simple method of effecting this has been lately discovered. It consists in forcing dilute hydrochloric acid through the cells of the wood, at a pressure of about two atmospheres. This impregnation must be continued for a length of time dependent on the nature of the wood. The bark is not previously removed, and by a very simple arrangement the fluid is introduced at one end of the log and passes out at the other. If while the wood is still wet it is exposed to pressure, the cells having been first washed out with water, its volume may be reduced to a tenth of what it was originally, the fibres being brought into the closest contact without being fractured or torn; and when dry they have no tendency to separate again. If it is pressed in dies, their details are brought out with the greates sharpness and the most perfect accuracy. Impregnation in this way can be used for a variety of purposes. After the action of the hydrochloric acid, washing out with water, and drying, the wood may be cut with remarkable facility, and it answers admirably for the purposes of the carver. The drying is effected by forcing air, at a temperature of about 100° Fahr., through the cells. The moisture is thus carried off with great rapidity; and, as the contraction is uniform through the whole mass, no cracks are produced. Dyes also may be introduced in the same manner into the entire substance of the wood, or matters calculated to preserve it from decay. Soluble glass, or recently precipitated silex, renders it both very durable and thoroughly incombustible.—*Intellectual Observer.*

DYNAMOMETERS.—Parties making or selling dynamometers, or instruments to measure the force in pounds exerted by any machine or belt, will do well to advertise them, as we have had frequent inquiry for them.

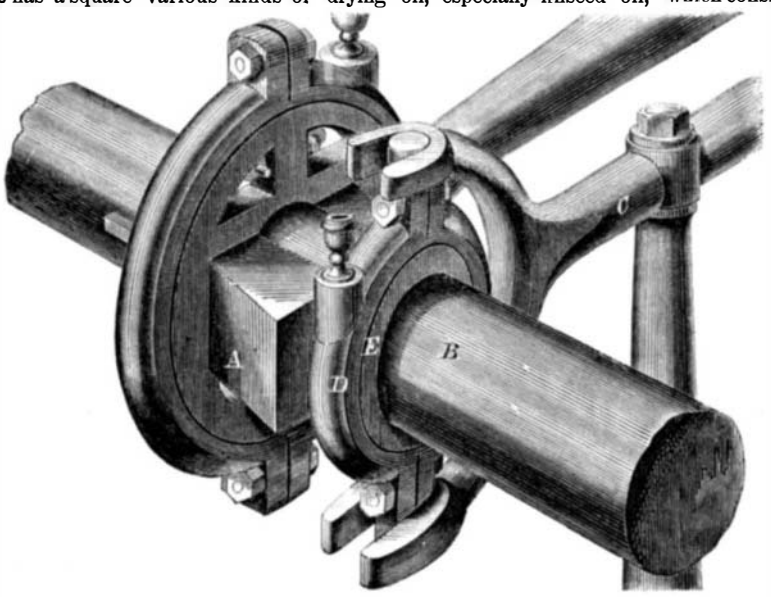
Improved Eccentric.

This is a most ingenious method for reversing and cutting off steam with one eccentric. By it the steam can be cut off at any point of the stroke with a common slide valve and without altering or affecting the lead on the steam or exhaust in any way.

In detail this invention consists of two wedges, A, fitted to the shaft, B. The eccentric has a square slot in it which these wedges completely fill, and they act the same as wedges would work driven by a hand hammer, for by slacking one wedge off, and driving the other in, the throw of the eccentric is changed at will. These wedges are worked in this way by the lever, C, which is attached to the straps, D, embracing a coupling, E, formed on the end of the wedges, so that as these and the coupling revolve together the lever is enabled to shift them without being disturbed itself.

The wedges have a feather or key on the shaft which holds them from slipping. This method of operating an eccentric is applicable to all classes of engines. Any lead required can be got by setting the wheel out of the center parallel with the slot. It is a neat contrivance for the purpose.

It was patented by D. F. Walker, through the Scientific American Patent Agency on March 7, 1865. For further information address him at Clearwater, Minn.

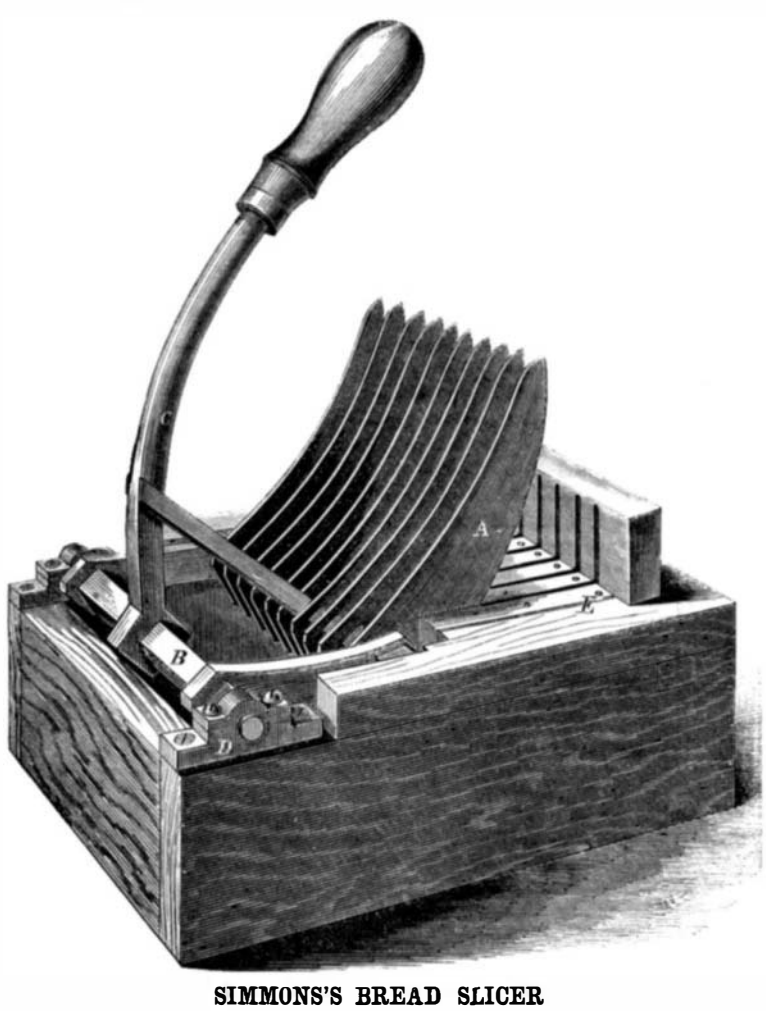


WALKER'S ECCENTRIC.

Improved Bread Slicer.

Stimulated by inquiries for a good bread slicer, inventors have produced several varieties of them, constructed on different principles but tending to the same end—rapid and certain delivery of slices of bread smoothly cut and of equal thickness. It is obvious that a simple machine for this purpose would be very useful in restaurants, hospitals, boarding houses, etc., where large numbers of loaves are cut up in a few minutes.

The engraving published herewith exhibits a very simple device for the purpose above stated. It is nothing more than a set of knives, A, of any required number, fastented to a shaft, B, said shaft being operated by a lever, C. The shaft turns in its bearings, D, and the knives work through slots in the board; it is obvious that by giving motion to the handle the knives will pass through a loaf placed under them. The cut made is a drawing cut which tends to sever the slice smoothly and without crumbling. A patent is ordered to issue on the machine through the Scientific American Patent Agency. For further information address the inventor, S. D. Simmons, San Francisco, Cal.



SIMMONS'S BREAD SLICER

International Iron-clad Show.

The iron-clads belonging to France and England are about to make an amicable tour together for the purpose of exhibiting their sailing qualities and general adaptation to the ends required of them. They are to cruise in the waters adjacent to the British Islands and to France, and will no doubt deport themselves in all ways possible in storms and calms, in smooth seas and rough—to the end that satisfactory reports may be made to the powers that be of their performances.

To the disinterested and impartial observer on this side the ocean it would not appear that much reliable information could be obtained in this way, and that so far as judging of the offensive or defensive qualities of iron-clad ships, the cruise will be quite useless. We shall hear of extraordinary speed, no doubt, and weatherly qualities, but what avail are these when heavy shot can be sent through one side and out at the other?

Paraffine for Waterproofing.

The materials which in modern times were first employed for water-proofing were beeswax and the various kinds of drying oil, especially linseed oil, which were rendered more siccative by boiling or some other of the processes usually employed for that purpose.

About forty years ago caoutchouc was first successfully used, for rendering fabrics and other materials waterproof, by the late Mr. Chas. Macintosh; and after an interval of about twenty years, gutta percha was first imported into this country, and immediately applied for similar purposes.

In 1832 paraffine was discovered by Reichenbach in the course of his admirable researches on wood and coal tars. He, however, only succeeded in obtaining it in very small quantity, so that for a long time it was only known as a chemical curiosity. It is to Mr. James Young that we are indebted for the production of this material on an industrial scale, by his process which he patented nearly fifteen years ago. About three years since a patent was taken out by Dr. Stenhouse for employing paraffine as a means of rendering leather waterproof, as well as the various textile and felted fabrics; and in August last an additional patent was granted Dr. Stenhouse for an extension of and improvement on the previous one, which consisted chiefly in combining the paraffine with various proportions of drying oil, it having been found that paraffine alone, especially when applied to fabrics, became to a considerable extent detached from the fibre of the cloth after a short time, owing to its great tendency to crystalize. The presence, however, of even a small quantity of drying oil causes the paraffine to adhere much more firmly to the texture of the cloth, from the oil gradually becoming converted into a tenacious resin by absorption of oxygen.

In the application of paraffine for waterproofing purposes, it is first melted together with the requisite quantity of drying oil and cast into blocks. This composition can then be applied to fabrics by rubbing them over with a block of it, either cold or gently warmed, or the mixture may be melted and laid on with a brush, the complete impregnation being effected by subsequently passing it between hot rollers. When this paraffine mixture has been applied to cloth, snch as that employed for blinds or tents, it renders it very repellent to water, although still pervious to air.

Cloth paraffined in this manner forms an excellent basis for such articles as capes, tarpaulins, etc., which require to be rendered quite impervious by subsequently coating them with drying oil, the paraffine in a great measure preventing the well known injurious influence of drying oil on the fibre of the cloth. The paraffine mixture can also be very advantageously applied to the various kinds of leather. One of the most convenient ways of effecting this is to coat the skins or manufactured articles, such as boots, shoes, pump-buckets, harness, etc., with the metal composition, and then to gently heat the articles until it is entirely absorbed. When leather is impregnated with the mixture, it is not only rendered perfectly waterproof, but also stronger and more durable. The beneficial effects of this process are peculiarly observable in the case of boots and shoes, which it renders very firm without destroying their elasticity. It therefore not only makes them exceedingly durable, but possesses an advantage over ordinary dubbing in not interfering with the polish of these articles, which, on the whole, it rather improves.

The superiority of paraffine over most other materials for some kinds of waterproofing consists in its comparative cheapness, in being easily applied, and in not materially altering the color of fabrics, which, in the case of light shades and white cloth, is of very considerable importance.

It will be evident from the statements which have just been made, that the employment of paraffine for waterproofing purposes is likely to become very exensive.—*Practical Mechanics' Journal.*

The Paris Society for the Encouragement of National Industry has offered a prize of $300 for an ink which will not corrode steel pens.

A Large Total.—The expenditures of the Government during the past year amount to the enormous sum of $1,200,000,000, or over $3,500,000 per day.