

STATISTICS OF STEAM BOILER EXPLOSIONS FOR THE YEAR 1870.

PREPARED FOR THE SCIENTIFIC AMERICAN BY THE HARTFORD STEAM BOILER INSPECTION AND INSURANCE COMPANY.

The steam boiler explosions in this country, for the year ending January 1, 1871, were numerous and destructive. We have kept the best record we could, our information having been received mostly through our agents and from newspapers published in different parts of the country. It must be remembered that the following record is of serious and destructive explosions only. There have been numerous slight accidents, such as ruptures of plates, resulting from overheating or carelessness in management, doing little damage and injuring no one. These are not included in the following record.

	No.	Killed.	Wounded.
Breweries.....	1	0	0
Propellers.....	1	4	0
Bone dust manufactory.....	1	0	2
Cotton mill.....	1	0	1
Britannia works.....	1	0	1
Carriage manufactory.....	1	0	0
Revenue cutter.....	1	0	0
Thrashing machine.....	1	2	3
Paper mill.....	1	0	0
Ferry boat.....	1	0	0
Car works.....	1	4	3
Agricultural works.....	1	4	3
Bleachery.....	1	0	0
Shoe factory.....	1	0	0
Steel works.....	1	1	0
Iron foundery.....	1	2	5
Chair factory.....	1	5	20
Pile driver.....	1	1	1
Boiler maker.....	1	0	4
Distillery.....	1	1	4
Sugar refineries.....	2	7	1
Public water works.....	2	1	1
Soap works.....	2	4	1
Brass founderies.....	2	1	2
Steam fire engines.....	2	1	10
Coal mines.....	2	7	14
Rag boilers.....	2	6	2
Heating and domestic boilers.....	3	1	0
Rolling mills.....	3	10	27
Woolen mills.....	3	1	7
Oil works and wells.....	3	1	3
Machine shops.....	4	2	3
Flour mills.....	6	14	7
Steamboats.....	7	136	26
Tug boats.....	10	41	13
Railroad locomotives.....	16	16	19
Saw mills.....	29	53	44
Total.....	118	326	327

A number of these boilers were under Government, State, or municipal inspection. In the cases of the steamboats, many of the killed were, without doubt, drowned or burned, as fire ensued in each case; but the original difficulty was with the boiler that exploded, killing and wounding many, and then other horrors followed.

We regard this record, and similar records of previous years, as evidence of the need of some well digested and effective system of boiler inspections throughout the country. If there be not compulsory law, many boilers in use would never be inspected; and yet, with the fact before us, that almost all public offices are more or less mixed with politics, it is very doubtful whether State and municipal regulations will ever accomplish the end sought.

This corporation (The Hartford Steam Boiler Inspection and Insurance Company) has made upwards of 12,000 examinations during the year. All the boilers under its care are examined at intervals of three or four months, and it is no uncommon thing to find defects, at those periodical inspections, which require immediate attention. The result is, that there never has been a serious explosion of any boiler under the care and inspection of the Company, and no person has ever been in the slightest injured.

We are aware that any boiler is, from careless management, liable to explode, no matter how carefully it may have been inspected; but we believe that an expert, familiar with boilers of all kinds, calling at a boiler room once in three or four months, looking over boilers or attachments carefully, and conferring with the engineer, will do much to remove the risk arising from carelessness. As we have already remarked, we fully believe in wholesome inspection laws; not such as have been foisted upon some States to the disgust of intelligent engineers and manufacturers, but laws prepared by men who know the wants of manufacturers and the community in this respect. And again, not such as are framed for the purpose of making a market for some "patent appliance," which may or may not have merit. We believe further, that inspection laws should recognize the work of companies making guaranteed steam boiler inspections.

This work is growing in favor with steam users, and there should be wholesome legislation on the subject, that such corporations may have guaranteed to them the privileges accorded to other corporations; and that steam users may be protected from worthless and irresponsible companies. This can all be done, and the steam user can then choose which he will have, the State or the guaranteed inspection—one he must have.

We are not able to estimate accurately the amount of loss to property from boiler explosions, but it will approximate to \$2,000,000.

The Castor Bean in California.

The U. S. Commissioner of Agriculture, in his report for January, says the cultivation of the castor bean in California is rapidly increasing. The amount raised this year will be quite large. One of the largest and most successful enterprises in this culture is that of Mr. Hedges, whose experi-

ments are carried on in the vicinity of Marysville. Mr. Hedges has under cultivation this season about 200 acres and expects to realize about 125 tons, all of the small "Illinois bean." The stalks of this variety vary in height from six to fifteen feet. The work of gathering begins in July and continues until the frosts set in. The drying grounds on this farm are described as large places cleared off to the "hard pan" of ground, and made smooth like a brick yard. On this surface the heads or clusters of beans are laid in the sun, many of them having been picked in a green state, and here, as they dry, they open. When pretty well "snapped," the heaps are raked over, and the beans removed and placed in a fanning mill, whence they are transferred in a merchantable condition to the sack. Mr. Hedges utilizes the hulls as manure, and it is asserted that they operate to loosen as well as to enrich the clay soil of his farm. This gentleman finds the cultivation of the castor bean so profitable that he purposes next season to plant 300 acres.

French Felt Waterproof.

We have been informed of the composition of this mixture, the manufacture of which has heretofore been regarded as a secret in France, and have made the following calculations regarding its cost:

The cost price varies according to the thickness or the quality of the fabric employed. The covers for wagons, in France, are generally 39 inches wide, and are sold for \$1 per yard; the original cost is about 45 cents, and the labor three cents per yard. For cart and dray purposes, they measure about 32 inches in width, and cost about the same. Their dynamometric strength is 450 pounds per square yard. The price of the covers can be reduced considerably by using cotton fabrics instead of linen.

The joint closer is sold in France at 50 cents per pound, but it can be made to cost only 20 cents.

Mr. Parent, chief engineer of the steamer *City of Paris*, who kindly furnished the information regarding this material, has used it for years with great success. It has also been adopted by the Imperial Navy.

The inoxidisable compound for waterproof is made thus:

	Grammes or	Ozs.	Drachms.
India-rubber.....	100.5	3	12
Finely-sifted sawdust.....	175	6	3 1/2
Powdered sulphur.....	10		52
Slacked lime.....	25		14 1/2
Sulphate of alumina.....	125		7 1/2
Sulphate of iron.....	125		7 1/2
Hemp tow.....	10		52

To mix the above, use heated cylinders, so as to obtain a very homogeneous paste, which is made into thin cakes, and afterward divide into small pieces to be dissolved.

To dissolve this substance, take 4 1/2 pounds of spirits of turpentine, benzine (common is preferable), petroleum or sulphuret of carbon to 2 1/2 pounds of the mixture. It must be stirred five or six times during twenty-four hours, at the end of which time the mass thoroughly dissolves.

The solution is then spread on the fabrics or articles to be preserved, by means of rollers, knives, or spatulas, adapted to the purpose. Apply as many coats as may be necessary, and then let it dry. As soon as the fabric is dry, it is passed under pasteboard laminating rollers, in order to give a luster to the surface. The fabric is then rolled up on a hollow iron pipe, which is covered with cloth to prevent it sticking to the iron, and the whole placed in a copper pipe, with a perforated lid or cover; steam is then introduced at a pressure of four atmospheres, which pressure is maintained for one hour, at the end of which time the operation is ended.

If it be desired to give these impermeable covers a black color, a solution of sulphate of iron, gall nut, and logwood is applied with a brush.

To make caps or joint closers the following proportions are used:

	Grammes.
India-rubber.....	2,125
Sawdust.....	1,500
Sulphur.....	200
Minium, or red lead.....	300
Alum.....	500
Slacked lime.....	500
Hemp tow.....	500

Dissolve the india-rubber in the above named quantity of benzine, then add the other articles and make a paste of the whole, and apply it when desired for joint closers, on steam engines, hydraulic pumps, or boilers.

India-rubber of inferior quality is best adapted to these compounds.—C. Widemann, in *Journal of Applied Chemistry*.

The Different Methods of Distinguishing Vegetable Fibers.

On account of the frequent practice, now-a-days, of spinning and weaving together cotton, linen, wool and silk, and on account of the difference in value between such fabrics, it has become a necessity to find reliable, simple and rapidly executed tests to distinguish them, inasmuch as the practiced sight and touch no longer suffice for this purpose. If the question be simply whether animal and vegetable fibers are mingled in the same fabric, it is possible to decide by a few very simple chemical reactions; thus wool and silk dissolve in warm caustic alkali, while vegetable fibers—cotton and linen—do not. The animal fiber is dyed yellow by nitric acid, owing to the formation of picric acid, and red by nitrate of mercury.

Schweitzer has proposed an ammoniacal copper solution as a test for cotton, as it is an excellent solvent for it. According to Persoz, silk is distinguished from wool and cotton by its capability of dissolving in chloride of zinc.

If wool be brought into an alkaline solution of oxide of lead, it is gradually blackened; for the sulphur, which is always

present in wool, combines with the lead to form black sulphide of lead, which is precipitated by the fiber.

Cotton may be discovered in linen fabric by the sulphuric acid test, proposed by Kinet & Lehnerdt. The finish is carefully removed from the fabric by repeated washings; the sample is then dried, about half of it steeped 1-2 minutes in sulphuric acid; it is then placed in water and rubbed gently and carefully between the fingers to effect a solution of the product formed by the action of the sulphuric acid upon the cotton. This process may be hastened by the addition of some alkali. The sample is then squeezed out and dried. During the time mentioned, the cotton thread has been dissolved, while the linen one remains behind; but the time mentioned must not be exceeded, otherwise the linen threads will also be attacked. To render this test applicable to colored fabrics, the color must first be removed.

Elmer's coloring and discoloring test, is applicable to the same purpose. The alcoholic solution of madder, in the course of 10 or 15 minutes, colors linen uniformly orange red, cotton uniformly yellow; cochineal tincture imparts to linen, a purple, to cotton, a light red tint. Mixed fabrics, treated with these tinctures, are not dyed uniformly, but appear striped.

The decoloration test is founded upon the fact that a linen fabric, dyed with cochineal, is discolored by chloride of lime solution more slowly than a similarly dyed cotton tissue.

Liebermann recommends fuchsin as an excellent means of distinguishing animal and vegetable fibers. Boil a solution of fuchsin with an alkaline lye, filter the colorless liquid from the precipitate, and, after gently warming, immerse the sample a few seconds in it. It remains colorless; but after thorough rinsing with cold water, the wool is dyed red, while the cotton remains colorless. After drying, every individual woolen thread may be recognized by its red color. The solution is best when prepared by dissolving a few grains of fuchsin in water, and gradually adding potash or soda lye till the color has disappeared. The solution can be preserved and used for several tests. In this test, silk behaves like woolen, linen like the other vegetable fibers.

Zimmermann proposes to discover cotton in linen tissues by dipping the sample for 8 or 10 minutes into a mixture of 2 parts of nitric and 3 parts of sulphuric acids. If cotton be present, gun cotton, which can be extracted by a mixture of alcohol and ether, would be formed in this manner.

Better than this, and really excellent for tissues that are not dyed, is Frankenstein's oil test. A sample of the goods is dipped into olive or colza oil, which is eagerly absorbed by the fabric. The sample is then pressed between pieces of unsized paper in order to remove the excess of oil. If the tissue consist of mixed fibers, it will now appear striped, the linen threads having become transparent and appearing lighter than the cotton threads, which remain unchanged. If the prepared sample, on the other hand, be placed upon a dark surface, the linen threads appear darker than those of cotton. In this, as in all other tests mentioned heretofore, it is advisable to pull out a few threads from the edge of the sample before proceeding with the experiment.

In conclusion, let us mention combustion as a means of distinguishing animal from vegetable fiber. Burning silk and woolen fiber gives rise to a disagreeable odor, like that of burnt horn, and leaves behind a black, carbonaceous mass, which is more voluminous than the original fiber. Vegetable fibre burns up more rapidly, giving off no strong smell, and leaving no voluminous residue.

Decidedly the best and safest method, and one applicable in all cases, is a microscopic examination, by which not only the structure, but also the nature of the fiber can be demonstrated. Cotton, wool and silk are easily distinguished by the microscope, as they differ materially in appearance. Cotton forms flat, narrow ribbons, curled up in spirals like those of a corkscrew; wool fiber is stouter than all others, and may be recognized by its scaly surface, while silk is the thinnest fiber, has the smoothest surface, and possesses the least structure. These appearances are very characteristic, and any one who has observed them once will ever afterwards recognize them again at first sight.

Sir Joseph Whitworth on Horse Railways.

"The use of horse tramways is being urgently pressed forward, and a large outlay is contemplated. In my opinion, they are not suited to the present times, and mechanical engineers have a right to enter their protest, considering the many obstructions there have been for many years past to the employment of road locomotives. If tollgates were abolished, and each county had an organized staff for making and keeping the roads in good order, using the steam roller, steam sweeping machine, and other necessary appliances, where there is large traffic, mechanical engineers would then, I have no doubt, soon produce a small light locomotive that would do its work quietly and most effectively; at the same time, pedestrians and those who ride and drive would have the enjoyment of good and clean roads, instead of the present badly paved and rough Macadam roads. The broken stones of the latter are now left, for the horses' feet and narrow wheels to consolidate, in a way it is quite distressing to see. The consumption of fuel per horse power is now so small that road locomotives could be employed at far less expense than the overworked and ill-conditioned horses we now see, while pedestrians and those who keep horses for pleasure would have good roads, and many gentlemen, no doubt, would have their well-made locomotives."

FROSTED FEET.—To relieve the intense itching of frosted feet, dissolve a lump of alum in a little water, and bathe the part with it, warming it before the fire. One or two applications are sure to give relief.

Chloralum—Its Value as an Antiseptic and Disinfectant Denied.

This new disinfectant, recommended by Prof. Gamgee, an account of which was recently published in this journal, has, according to the *Scientific Review*, been experimented upon by Dr. Crace Calvert, who finds it valueless as a disinfectant.

Dr. Ballard, the medical officer of health for Islington also entertains modified notions as to the value of the chloralum. He has the greatest personal respect for Prof. Gamgee, and for the admirable work he has done—no one more; but Dr. Ballard is sure that he is not warranted in propounding chloralum as a "disinfectant," and still less in recommending its use as such, without, at the same time, adducing the evidence on which his opinion and recommendation are grounded. The *onus probandi* lies with him; he cannot make the assertion, and then leave the profession to show that he is wrong, although there are plenty of bad precedents for such a course. "Chloralum" may turn out to be the best disinfectant known; his discovery may possibly be one of the highest practical value, but he cannot be permitted to anticipate observation and experiment. He has as yet advanced nothing to satisfy Dr. Ballard or anyone, that chloralum used in any way is capable of destroying the peculiar manifestations of a morbid contagion. That it is capable of checking the throat lesions in diphtheria and scarlatina is no more than has been said, by the highest authorities, of ordinary alum.

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Belted that is Belting.—Always send for the Best Philadelphia Oak-Tanned, to C. W. Army, Manufacturer, 301 Cherry st., Phila.

Wanted.—A partner, with a small capital, to carry out an invention of great value. For curiosity, address L. David, Montgomery, Ala.

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For Sale at a bargain.—A complete one-set woolen mill, with an established trade. Address H. M. Woodruff, Pewee Valley, Ky.

Foundry and Machine Shop for sale. See page 156.

Master-Machinists will be furnished with Photographs of improved Wood Machines for Car Work, by addressing Richards, Kelley & Co., Philadelphia.

Lathe Wanted.—A second-hand Lathe, to swing 36 inches, 10 feet between centers; must be a good tool, and in good order. Marvin & Co., 255 Broadway.

"Edison's Recording Steam Gage and Alarm," 91 Liberty st., N. Y. Recommended by U. S. Inspectors as protection to good engineers, the charts showing quality of work performed.

For mining, wrecking, pumping, drainage, and irrigating machinery, see advertisement of Andrews' Patents in another column.

For Sale.—The Combined Tool illustrated in Scientific American, Jan'y 25, 1871. Wilkinson & Boyle, Plattsburgh, N. Y.

Peteler Portable R. R. Co. contractors, graders. See adv'tment.

Wanted.—The address of every reader of the SCIENTIFIC AMERICAN, to whom will be sent FREE a specimen number of that first-class Family Magazine, THE PHRENOLOGICAL JOURNAL. Address S. R. Wells, 339 Broadway, N. Y.

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Keuffel & Esser 116 Fulton st., N. Y., the best place to get 1st-class Drawing Materials, Swiss instruments, and Rubber Triangles and Curves.

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For the latest and best Improved Hub Lathe, Hub Mortising Machine, Spike Lathes, Spike Tapping and Throating Machine, address Kettering, Strong & Lauster, Defiance, Ohio.

Thomson Road Steamers save 50 per cent over horses D. D. Williamson, 33 Broadway, New York.

Patent Elliptical-gear Punches and Shears.—The greatest economy of power, space, and labor. Can be seen in operation at our factory, in Trenton, N. J. Address American Saw Co., 1 Ferry st., New York.

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Taft's Portable Hot Air, Vapor and Shower Bathing Apparatus. Address Portable Bath Co., Sag Harbor, N. Y. (Send for Circular.)

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McCauley's Improved Force Pump, especially adapted to deep wells. Send for Circular. R. A. McCauley, Baltimore, Md.

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Peck's Patent Drop Press. Milo Peck & Co., New Haven, Ct. Self-testing Steam Gage—Will tell you if it is tampered with, or out of order. The only reliable gage. Send for circular. E. H. Ashcroft, Boston, Mass.

Wanted.—A Partner, with capital, in a newly invented Gun. Address A. H. Townsend, Georgetown, Colorado.

Agents wanted, to sell the Star Bevel. It supersedes the old style. Send for Circular. Hallett & White, West Meriden, Conn.

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Answers to Correspondents.

CORRESPONDENTS who expect to receive answers to their letters must, in all cases, sign their names. We have a right to know those who seek information from us; besides, as sometimes happens, we may prefer to address correspondents by mail.

SPECIAL NOTE.—This column is designed for the general interest and instruction of our readers, not for gratuitous replies to questions of a purely business or personal nature. We will publish such inquiries, however, when paid for as advertisements at 10¢ a line, under the head of "Business and Personal." All reference to back numbers must be by volume and page.

J. T. says: "I have made an improvement in machinery, by the use of which one half of the fuel now used in running machinery will be saved. I had my model about ready to send you, but have been informed that patents will not be issued to persons who participated in the late rebellion. Upon this I destroyed my models, until I can learn for certain, as I was a participant in that unfortunate affair." Our correspondent is informed that his participation in the rebellion does not debar him from applying for a patent. Since the close of the war, patents have been taken out, through the Scientific American Patent Agency, by General Beauregard, and other distinguished warriors. They have converted their swords into pruning hooks, and are heartily engaged in the conservation of peaceful and improving arts. Our correspondent is advised to reconstruct his model, and send it along by express, directed to Munn & Co., 37 Park Row, N. Y.

T. B. S., of Ind.—J. P. Joule once made an electro-magnet which raised 140 times its own weight. An account of this magnet is given in "Annals of Electricity," Vol. V., page 137. An ordinary electro-magnet will raise 20 times its weight, with proper battery power. Very small electro-magnets have been made to lift 2,334 times their own weights. The powerful electro-magnets of Joule were tubes with thick walls, split, and wound in the direction of their length.

J. C. W., of Mass.—Railroad managers have had their attention called to elastic car wheels, packed with rubber, paper, wood, etc. Some of these devices are now undergoing trials which will settle the question of their worth. All new improvements of magnitude are introduced slowly. If the wheels in question sustain in trial what is claimed for them, their general adoption is only a question of time.

B. N. P., of —.—The same number of units of heat is required to heat a given mass of water, no matter whether the heat be conveyed into the water by steam, or hot water jets.

J. A. F., of Mo.—A gas, in expanding to its original volume after compression, absorbs as much heat as it evolved during the compression. There is neither gain nor loss in this respect.

A. R. S., of Ohio.—The marginal scale, on Auchincloss' Travel Scale is made to correspond with the travel scale.

FILING CIRCULAR SAWS.—I swage the teeth, at the point, to a gage on both sides, of sufficient width to clear the blade while in the log, and file perfectly square on the face and back of the teeth. If A. O. B. will dress his saw in this way, it will give satisfaction in soft or hard timber.—S. H., of Pa.

W. F. H., of N. Y.—You will not be able to stop the leaking of your cider vats without taking out the cider, and having them overhauled by a first-class cooper.

T. E. N., of Tenn.—You will find the information you wish in regard to capillary attraction, in any good treatise on physics. To answer you here would occupy too much space.

P. A., of Mich.—The subject of ice formation was treated at length in Vol. XXII. of this journal. We do not wish to reopen this subject at present. You will, by reference either to the volume referred to, or to works on physics, be able to answer your query.

Queries.

[We present herewith a series of inquiries embracing a variety of topics of greater or less general interest. The questions are simple, it is true, but we prefer to elicit practical answers from our readers, and hope to be able to make this column of inquiries and answers a popular and useful feature of the paper.]

1.—CEMENT.—We want a cement to fasten wooden drawer handles on bureau drawers, after the same are painted and varnished.—S. & C.

2.—SHELLAC VARNISH.—I wish a recipe for the best shellac varnish.—A. R. S.

3.—TO IMITATE ROSEWOOD.—Will some of your numerous readers please give me a good recipe for staining, in imitation of rosewood.—H. G. W.

4.—SUPERHEATING STEAM.—I have a boiler of twenty-five horse power, from which I carry steam 800 feet. Can I profitably superheat my steam? and if so in what manner?—P. W. G.

5.—SOLDERING CAST IRON.—Can any of your correspondents let me know if there is any kind of fluid that can be used, with soft solder, to solder cast iron together, and if it will do for stove foundry iron and common gray iron, providing the surface be clean? I use chloride of lime, water, and sal ammoniac for wrought iron, steel, brass, copper, zinc, etc.; chloride of lime, two fluid ounces; water, two fluid ounces; sal ammoniac, one half a teaspoonful; but it will not work on cast iron to any advantage.—W. S. B.

6.—HARDENING TALLOW CANDLES.—Is there any cheap method of hardening tallow candles, so as to render them less objectionable?—E. H. H.

7.—SPIRAL SPRING.—What sized wire must I use for a spiral spring, and what size must the coils be, to stretch three fourths of an inch, with a strain of 200 pounds, without setting the spring? Also, what size rubber spring will do the same work? Is rubber as good as wire for such a spring?—F. W. H.

8.—WATER HEATER.—How can I stop my heater from leaking? It is constructed in the cylinder form, with six copper pipes passing through, and the escape steam passing around the pipes. The leakage occurs from the expansion and contraction of the pipes, where they are fastened in the cast iron head.

Recent American and Foreign Patents.

Under this heading we shall publish weekly notes of some of the more prominent home and foreign patents.

MOLD AND PATTERNS FOR CASTING GROOVED ROLLERS.—John Herald, Otsego, N. Y.—The object of this invention is to so construct the molds for casting rollers or sheaves with grooved edges, that the grooves in the edges will be accurate, and throughout of the desired shape.

TILE, OR FIRE-BACK, FOR FIREPLACES.—Joseph Hackett, Louisville, Ky.—This invention relates to a new tile, or fire-back, for fireplaces, which is so made, that it can be readily applied without cementing or special fastenings, radiate the heat in the most advantageous manner, and form part of the throat of the flue.

CARPET RAG LOOPER AND SEAM RIPPER.—Daniel A. Russell, Windham, Ohio.—This invention relates to a new apparatus for connecting the ends of woolen or other rags preparatory to the weaving of the same into rag carpet. The invention consists in the use of a perforated knife blade, which is pivoted to a block, and held in an upright position thereon by a spring catch.

BALING PRESS.—E. R. Wallace, Jonesville, S. C.—This invention relates to a new baling press, of that kind in which two followers are used, one above the other, they being secured, respectively, to right and left hand screws, and moved forwards or away from each other by being turned together with the box. The invention consists in a new combination of parts.

INDIA-RUBBER SHOES.—C. Meyer, New York city, and John Evans, Rochester, N. Y.—This invention relates to improvements in india-rubber shoes, and consists in shoes provided with raised ribs or other raised figures on the surface, with rows of stitching, or imitation thereof, by the sides of the said ribs, which inclose spaces representing the openings made in the front uppers of sandals, or representing other ornamental figures, the same being made by means of compressing rollers, one having the reverse of the ribs or other raised figures, and the indentations required, engraved on it, the other being plain, between which rollers the outersheet of which the shoe is composed is formed from the mass, at the same time receiving the impressions the said rolling being done before the rubber is vulcanized and made up into the shoe.

HOOP SKIRT.—James O. West, New York city.—This invention relates to improvements in hoopskirts, and it consists in a novel construction of the same, calculated to form, by the arrangement of the hoops and an adjusting band, a prominent and efficient adjustable bustle.

BATHING BRUSH.—Joseph Marshall, Brooklyn, N. Y.—This invention relates to improvements in bathing brushes of that kind in which a sponge or other porous article is arranged within an annular rim or border of bristles. The invention has for its object to prevent the water from entering between the back of the brush and the plate which holds the bristles and from thereby injuriously affecting the wood and wire-work of the brush.

FASTENING END BOARDS IN WAGON BOXES.—George W. Diller, Odell, Ill.—This invention relates to a new and useful improvement in mode of fastening end boards in the boxes of wagons, and consists in a hinged cleat and staple, and hook, connected with the side of the box.

HAT SIZING MACHINE.—James H. Hopkins, Newark, N. J.—This invention has for its object to furnish a simple, convenient, and effective machine for sizing hats, which shall be so constructed and arranged as to do well and thoroughly work which has heretofore been done only by hand.

OILER FOR THE JOURNALS OF PULLEYS AND OTHER WHEELS.—E. Douden, Lykens, Pa.—This invention has for its object to furnish an improved oiler for oiling the journals of loose pulleys and drift car wheels, and for use in other cases where a hub revolves upon a journal, and which is simple in construction, conveniently manipulated, and prevent the waste of oil.

WASHING MACHINE.—Lawrence White, Orford, Iowa.—This invention has for its object to furnish a simple, convenient, cheap, and effective washing machine, which will wash the clothes quickly and thoroughly, and without rubbing and wearing them, the washing being done by squeezing out the water, and again allowing them to become saturated.

REVOLVING CHURN.—F. B. Chapman, Salisbury, Mo.—This invention relates to a new and useful improvement in a churn for converting cream and milk into butter, and consists in revolving the churn instead of the dasher.

CULTIVATOR.—William Gowen, Bartlett, Tenn.—This invention has for its object to furnish an improved cultivator, designed for use in cultivating cotton, corn, and other crops planted in drills or rows, which shall be simple in construction, effective in operation, and easily controlled when at work and which may be easily adjusted for cultivating narrow rows, or for use as a harrow.

PLOW.—Alexander Rickart, Schoharie, N. Y.—This invention has for its object to improve the construction of plows so that the draft may be applied to the plow in the rear of the moldboard, which will enable the beam to be made lighter than is possible when the beams are made in the ordinary manner, and which will at the same time give it sufficient strength.

PRESS.—Christopher D. Findlay and David D. Craig, Macon, Ga.—This invention relates to improvements in presses for hay, cotton, and other like