Bullets Swerved by Electricity.

A curious phenomenon was recently observed by the committee of the Swiss Federal Rifle Meeting at Winterof the troops. It was found that nearly all the shots fired from the right side of the range had hit the target to the right of the bull's eye, while those fired from the left side had, with an equally singular persistency, hit the left half of the target. The great number of men who took part in the shooting precluded the idea that this singular result could have been due to the personal peculiarities of the soldiers; for while it may be true that one marksman habitually shoots too high, another too low or to the right or left of the mark, with a large number of individuals firing at the same target, these idiosyncrasies of marksmanship would be set off one against the other and the misses would be fairly distributed on all sides of the bull's eye. It became necessary, therefore, to find an extraneous and single cause for the remarkable uniformity with which the bullets appeared to have been deflected from their proper course. The wind could not have produced the effect noted, since, in the first place, allowance had doubtless been made by the riflemen for deflection by aerial currents; and on the other hand, if the wind had diverted the missiles, the deflection would have been in the same due to the wind, why not for the deviation due to direction on both sides of the range. An examination of electricity? the steelclad bullets extracted from the targets disclosed the fact that they had become magnetic; and this led the committee to entertain the theory that the phenomenon observed by it might have been due to electric influence exerted by the large number of telegraph and telephone wires which run along both sides of the range affected by magnetism. Artillery would probably reat Winterthur. Further experiment at the ranges of main destructive enough on the battle field by the use Thun and Berne proved this theory to be correct; and the remarkable discoveries made at these trials may effect another complete change in military tactics. The following account of one of the experiments is given by the Journal de Génève:

"At Thun authorities established parallel with the rifle range, at a distance of a little more that 40 yards, an electric current of 8,000 volts, carried along four steel cables. With a view of tracing the whole effect, paper circlets were placed at every 10 yards. The first experiments were made with the Swiss model rifle of 1889. With this the influence of the electric current was at once apparent. In a distance of 260 yards the bullet took a lateral deviation of 24 yards, and after that the curve of the trajectory was still more marked. The second experiments were made with the Japanese 33 mm. rifle of Col. Yamagata, and they were still more decisive, the bullet being rapidly attracted to the elec-

tric wires and following their course with absolute servility. Further attempts were made with artillery. The range selected was one of 3,000 yards, and 200 yards thur in summing up the results of the practice shooting in front of the targets, but 40 yards to the side, was placed the electric battery. Every shot was diverted by its influence far to the side of the target—to be exact, the deviation was one of 14 degrees.

"The conclusions drawn from these experiments are that a section of infantry exposed to fire at 300 yards would enjoy complete safety if a dynamo or accumulator were placed on its flank; a whole company would be in the same security at 500 yards, and artillery fire could be rendered innocuous at 1,000 yards. If these facts are sound, the new small bore rifle is doomed, and we shall have to return to the heavy bullet of lead, because it is unaffected by electricity. But to military reformers this will signify a repulse along the whole

The facts may be as stated, but the conclusions by no means follow. We should dislike, in case of a fight, to be the man running a dynamo that had a weakness for drawing bullets to it. It would have all it wanted of them, and the attention of the commanding officer would be chiefly occupied with detending his dynamo. Besides, if skilled marksmen can allow for the deviation

It would, perhaps, be premature to assert that the consequence of this discovery will be the doom of the modern small bore military rifle, with its steel jacketed bullet; for it might be practicable to inclose the leaden missile in hard bronze or some other metal not of explosive shells. It is in naval warfare that the discovery may have the most important consequences. In Conan Doyle's "Stark Munro Letters" the hero is credited with an invention to render a warship immune from the shots of an enemy by placing electric accumulators at its stem and stern. The idea was to deflect steel projectiles by magnetism, just like the Swiss military authorities have in fact succeeded in doing. It would certainly be a revolutionary departure if, instead of incasing our battleships in heavy bombproof armor, we could encompass them with an impalpable magnetic veil which would compel the great armorpiercing steel projectiles to pass harmlessly by.

The discovery, however, will give the military and naval experts a new problem to work out. In passing it is worthy of remark how frequently the apparently impossible feats suggested by imaginative writers have been followed by the demonstration of their possibil-sion.

ity. Phileas Fogg's wonderful trip around the world in eighty days would to-day be a very commonplace performance; and another generation may see Stark Munro's magnetized battleship an accomplished fact. Fiction seems stranger than fact only because so small a part of the truth of science has been revealed to humanity.

Library Circulations.

Those high class weeklies that are in general demand at the public libraries throughout the country enjoy circulations" that are often beyond the claims of their publishers or the beliefs of advertisers. It has been recently shown that, during eleven days, the six copies of Harper's Weekly were called for and read by 550 people in the Chicago Public Library. In the same period at the same place, four copies of the Youth's Companion were read by 228 individuals and two copies of the Sci-ENTIFIC AMERICAN by 213 people. If the public libraries of the whole country showed the same proportion of calls for these publications, it will be readily seen that their library circulation alone must run away up into the thousands.

But there is a vast number of weeklies and monthlies, too, that do not get into the public libraries, for the reason that their intellectual caliber is not high enough. This is an important item which all advertisers might wisely consider—whether a medium is of a sufficiently high standard to find place in the public libraries, because, if it is, it is sure of a much larger number of readers than if it is not.—John Chester, in Printer's Ink.

New Metals for Coins.

Advices from Washington, D. C., state that experiments with pure pickel and aluminum as substitutes for the present nickel pieces and one and two cent bronze pieces will be made at the mints by order of Director Preston during September or October. A resolution was passed by the House of Representatives authorizing such experiments. There is some doubt whether the actual adoption of a new metal for the minor coins will be recommended at an early date by the treasury officials, even if the experiments prove successful. The objection to a change in any form of coins or notes is the disposition of the public to refuse the old forms and insist upon having the new. This would drive into the mints for recoinage \$14,000,000 in nickel pieces, which are now in circulation, and \$7,500,-000 in pennies. The advantage claimed for pure nickel, instead of the alloy now used in five cent pieces, is its greater hardness, durability and distinctness of impres-

RECENTLY PATENTED INVENTIONS. Railway Appliances.

STREET RAILWAY SWITCH.-Hugo L. Dallig and Wladyslaw Kryszewski, Jersey City, N. J. This is a switch which may be readily set by the driver or motorman on a car, according to the direction in which the car is to travel, either along the main track rails or to the side track rails. The invention comprises a pivoted switch point on the under side of which as a segmental rack meshing with a pinion carried by a rock shaft in gear with a second rock shatt carrying two arms, while an arm pivoted on one of these arms has a head adapted to be engaged by a roller carried by the car, and the other arm is connected with a lever carrying a headed arm also adapted to be engaged by a roller carried by the car.

CAR COUPLING. - Thomas Galligan, Bradford, Ohio. This invention relates to couplings of the Janney type, in which the drawhead has a pivoted laterally movable knuckle, the coupling being automatieally effected when two cars come together, and the cars being readily uncoupled from the side, without it being necessary for the trainmen to go between them. The pivoted knuckle has a hooklike latching jaw, and a spring is adapted to hold the jaw in coupled engagement. The hook nose is slotted and perforated to permit the coupling of ears with a link and pin of the old style, the link being held in connection with the coupling so it will not be lost when not in use.

CAR COUPLING. - Joseph L. Linon. Narbonne, France. According to this improvement, the coupling apparatus attached to each end of the car comprises a spring jaw placed horizontally on one side and a shackle placed vertically on the other side of the ordinary coupling, the shackles being always opposite the corresponding jaws when the cars come together. The shackles are of such depth as to allow of a certain amount of variation in the height of the car. The coupling is automatically effected as the cars come together. and the cars are readily uncoupled from either side.

Electrical.

ELECTRIC RAILROAD. - Charles Sill. New York City. This invention provides for dispensing with both the overhead conducting wires and the under group I conduits which have heretofore been employed for supplying the current for electric cars, and substituting therefor a conductor placed in a longitudinal duct within the rail. A sectional trolley wire extends in a recess along the inner side of the rail, the conductor and the trolley wire being normally disconnected from each other and automatically connected as the car page along, whereby all sections of the trolley wires are cut out and remain dead except when a car is passing over them. By the construction provided for making connection between the conductor and the trolley, complete insulation is secured and all moisture is excluded from the duct in which the conductor is located.

ADVERTISING DEVICE.—Frederick A. Ruge, Springfield, N. Y. According to this device, a series of incandescent lamps is arranged in fanciful shapes or forms to attract attention, means being provided for closing the circuits through any desired series of lamps and leaving the others cut out. By this means a certain sign may be exhibited for four or five minutes, and after this exhibition the circuit closer will be turned to close the circuit through another series of lamps showing another sign.

Mechanical.

PIPE WRENCH. - Joshua Musgrave and William Cook, Aguilar, Col. This is an improve ment in wrenches which have a chain to engage around a pipe, and provides for such construction of the wrench that an equal pressure may be brought to bear on substantially the entire circumference of a pipe, obviating the danger of crushing in the pipe. The wrench iaw has a curved serrated inner surface, and on its outer end are fingers designed to be engaged by lateral shoulders on the chain links, each of which has a bifurcated portion and a stem portion, and is preferably curved on its inner edges to conform somewhat to the curvature of

MACHINE TO HULL COFFEE BERRIES. -Afredo D'Costa Gomez, Bucaramanga, Colombia. Beneath the nopper, from which the berries drop in a stream, according to this improvement, are two rollers of unequal size revolving in opposite directions at different rates of speed, the larger roller being roughened and the smaller one smooth, a knife separator projecting upwardly between the rollers. The berries are subjected to sufficient crushing or squeezing pressure by the rollers rapid paying out of the tapes, and this friction may be to cause the fibrous hull to adhere to the rough surface increased by manual pressure as desired. The apparatus of the larger roller, the grains going toward the small is very compact, a case about three inches in diameter roller, and the separation being completed by the knife accommodating tapes fifty feet long.

PAPER MAKING MACHINE.—George W. Lewthwaite, Greenwich, N. Y. This invention provides yielding perforators for puncturing the felt belts for carrying wet pulp while the water is being extracted from the latter, instead of the rigidly mounted pins heretofore employed, by which the felt is torn or cut. The pins, according to this improvement, are supported in a yielding material, such as rnbber, held in troughs secured in V haped longitudinal grooves in a roller provided for each endless felt apron over which the wet pulp is carried, whereby the pins will yield out of the felt without slitting it, and thus preserve the strength and porceity of the felt

Miscellaneous.

CASH RECORDER. - David J. Wilson, Washington, D. C. This is an instrument for use by bank tellers and similar officers, the teller printing in the depositor's book the amount and date of the deposit and simultaneously printing the amount upon a record strip, adjustably fixed in the top inner portion of the window

upon the record strip and printing the sum at the foot, The book, on presentation, is placed in an opening in the side of the casing of the machine, where a type bar has two sets of adjustable type, strip holding devices being adjacent to one set of type, and a book clamp holding the book in position to receive the impression from the other set of type, while printing devices operate the type of both sets simultaneously.

BICYCLE RAILWAY, -William F. Mangels, Brooklyn, N.Y. This invention provides an apparatus by means of which an unskilled person can safely mount and ride around a track without incurring danger. Within a suitable building is arranged a track, preferably but little wider than the tire, and having low side guards, and adjacent to the track, at about the height of the handle bar, a continuous rail is supported by fixed standards, the top and bottom edges of the rail being adapted for engagement by grooved wheels carried by hangers on an auxiliary frame attached to the bicycle The frame is light and readily attached to the bicycle, the latter being then securely held in vertical position on a good track, where it may be propelled with but little friction by an inexperienced rider.

PORTABLE FIRE ESCAPE. - Edward Riley, Spokane, Washington. This is a device which may be carried in a satchel or in the pocket, and consists of two metal tapes wound on a pulley having differential sections inclosed in a metal case, a combined suspension and brake device of elastic rod or wire being wound around the enlarged central portion of the pulley and extending below the case for connection with a strap, to be attached to the body of the person to be lowered. The friction device acts as a brake to prevent too

SASH LOCK AND OPERATOR. - Michael F. Robinson, New York City To raise and conveniently lock a sash to form any desired opening, for ventilation or other purposes, or to securely lock it when entirely closed, without using the ordinary weights and sash cords, this inventor has devised a construction which comprises gearing suitably located in a small casing in the side of the window casing and engaging a rack on the sash, a spring operating the gearing in connection with a locking device composed of a clutch, one member of which is connected to the gearing, while the other member is movable in and out of connection. The locking mechanism cannot be interfered with by any one from the outside.

CURTAIN FIXTURE. - Alderic F. Gironard, Leominster, Mass. This is a fixture which may be adjusted to any length of shade roller and secured upon the window casing without the aid of nails or screws. Brackets carrying adjustable slides to which the curtain fixtures may be conveniently attached are

frame by means of clamping plates which are brought into firm engagement with the inner faces of the window frame through cross rods connected by a sleeve, the rods and sleeve having a right hand interior thread at one end and a left band thread at the other end and the ends of the sleeve sliding within an outer tube.

MUSICAL INSTRUMENT. - Francisco Barrientos, San Juan Bautista, Mexico. This invention relates to instruments played with a pick, and is designed to enable the performer to readily play in octaves, producing sounds as if he were playing two instruments. For this purpose a special construction of the instrument is provided, in which a raised stop is arranged on its body laterally of the strings to arrest the pick, the pick being double, and the performer striking the strings with it both above and below the bridge.

VEHICLE AXLE SPINDLE AND BOX.-John A. Rumrill, Salina, Kans. The axle spindle, according to this invention, has a socketed stub end and a grooved journal bearing, while the box has hollow bearings spaced by an annular chamber, the improvement rendering the box and axle spindle easy to inbricate, and also affording means for storing a supply of lubricant which automatically feeds itself while it lasts

FARRIER'S KNIFE. - Francis M. Me Cartea, San Juan, Cal. This knife has at one end of its handle a curved knife blade secured in its socket by a thumb screw, the blade having at its end a mud scraper and a hook or pick for cleaning out the seam on the bottom of the horse's hoof, while at the other end of the handle are pivoted a bleeding knife and a searching tool. In the handle are also chambers to receive two combination tools, one consisting of a mud spoon, a lance, and a sounder or probe, and the other constituting a hoof pick, a needle and tweezers.

SUCTION DREDGE.-James H. Bacon, Wilnington, N. C. This dredge has an open bottom suction box in which swing oppositely arranged con-nected cutters that are automatically actuated on dragging the box along the bottom of a waterway. The box is flushed by valves in its sides actuated from the deck of the dredge, and adjustable stops limit the swinging motion of the cutters.

APPLYING PAINTS OR VARNISHES. Howard C. Cleaver, London, England. This inventor has devised an apparatus to facilitate the application of oil paint, flatting paint and varnish with greater rapidity, uniformity, smoothness and lightness than is possible with a brush, the paint or varnish being atomized and projected in fine spray by an air blast through an exit orifice, where it is met by a blast directed across the orifice. By this means the paint or varmsh is laid so lightly that a second coat may be applied as soon as the previous one becomes tacky, quickly giving a smooth surface without brush marks and dispensing with rubbing down.

WHEAT STEAMER, HEATER, ETC .-William H. Reitz, Somerset, Pa. This is a device for use with flour mills, regulating also the feed of the

wheat to the break rolls. The flights of the conveyer are so constructed that the wheat will be carried from under the conveyer and thrown over the top to the opposite side, the grain being moistened by steam or water of condensation at a point above the conveyer, and the flights bringing the wheat in contact with the steam while the grains are thoroughly mixed to render them all equally moist. The grains are also thoroughly warmed, the heat serving to maintain the moisture on the exterior of the grain.

CHURN OPERATING MECHANISM. Zachariah A. Taylor, Bridgeport, Ala. For churns!having a vertically movable dasher, this inventor has devised an operating mechanism consisting of a snitably mounted drive shaft geared with a countershaft whose gear carries a series of pins adapted to engage an arm on a vertically movable cross head, the pins thus raising the cross head as the gear is revolved, and the cross head, which is connected with the dasher, being quickly returned by means of springs. Owing to the regularity of the stroke, the cream is not splashed or wasted, and the butter is quickly formed. The mechanism is simple and designed to be operated by a treadle.

JAR CLAMP.-Frank H. Palmer, Brooklyn, N. Y. According to this invention a ring-shaped frame seated on the jar cover has downwardly extending erms carrying lugs adapted to engage a flange on the neck of the jar, and on the top of the frame are lugs in which is held a spring rod on which is fulcrumed a cam with a friction roller in its cam end. By means of the cam lever the clamp is readily applied, the spring rod yielding sufficiently to prevent the cracking or breaking of glass, porcelain, etc., when the cover is clamped on the jar.

SANITARY PAIL.—Charles M. D. Baron. New York City. This invention covers an improve ment in the construction of a pail on which a patent was formerly granted to the same inventor, greatly lessening the cost of manufacture and providing an airtight cover for an ordinary pail, to be readily secured in place by means of the bail. The cover is light and strong, and the handle on the bail acts as a locking roller for the

Designs.

GRIP FOR SKIRTS, ETC.—Ella L. Cole, New York City. To hold a belt in close engagement with a skirt or trousers, this device has one depending shank adapted to go outside the belt and another depending shank on which are twin spurs or hooks.

Note.-Copies of any of the above patents will be furnished by Munn & Co. for 10 cents each. Please seud name of the patentee, title of invention, and date of this paper.

NEW BOOKS AND PUBLICATIONS.

ALASKA: Its History and Resources, Gold Fields, Routes, and Scenery. By Miner W. Bruce. I lustrated. New York: Frederick Warne & Company, 8 Cooper Union. Pp. 128. Cloth \$1.25. Paper edition 75 cents.

Many want to know about Alaska, what the much debated country is, what is its climate, its conditions of life and different industries. This desire, the present book, with beautiful illustrations and really attractive text, will excellently supply. There is much thatis practical and popular in it, such as the descriptions of the Indians, with their mode of life, with their boats, clothing, etc., all of which is in the line of the most attractive kind of anthropology. The illustrations from photographs are especially good, and say a great deal for the ir atmosphere of the country. One of Sitka, 10:30 P. M., speaking eloquently of the long Arctic twilight.

How to Do Business. By Seymour Eaton, of the Drexel Institute. Philadelphia. Philadelphia: P. W. Ziegier & Company. Pages 334.

This is, in many senses, an up-to-date book, bright, original, and full of information not generally found heretofore in books of this class. Modern methods of banking and making collections; the business in negotiable papers, stocks, bonds, and other securities; insurance; importing, exporting, shipping, and ware housing; margin trading; business correspondence; short cuts in figures; doing business by telegraph, and modern bookkeeping ideas, form the subjects of some of the most important chapters. For a young man wanting to understand how business in general is conducted as the great commercial centers, this book, thoroughly mac tered, affords a "short cut" to a most serviceable stock of information. Its author is Director of the Department of Industry and Finance of the Drexel Institute, and the book has questions for the subject matter of each chapter, thus adapting it for use in commercial schools and business colleges.

neering Magazine. Pages 474. Price

This volume, and the one preceding it, form a classifled index to the engineering literature in the periodical press for the past eleven years. The work was begun by the Association of Engineering Societies, and is now being carried out by the Engineering Magazine, it being designed to publish an annual volume hereafter.

A MANUAL OF STEAM BOILERS. Their Design, Construction, and Operation.
By Dr. R. H. Thurston, Sibley College, Cornell University. New York:
John Wiley & Sons. Pages 879. Price \$5.

This is the fifth edition, revised and enlarged, of a well known standard work for technical schools and enwhiteers, designed to be a fairly complete systematic. and scientific treatise, while yet meeting the practical wants of an engineer laying out work. Dr. Thurston is also the author of a "History of the Steam Engine," "Engine and Boiler Trials," "Materials of Engineerand other works in this line, and for the past quarter of a century has been recognized as one of our leading authorities in mechanical engineering.

Business and Personal.

The charge for Insertion under this head is One Dollar a line for each insertion; about eight words to a line. Adver-Thursday morning to appear in the following week's issue

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The celebrated "Hornsby-Akroyd "Patent Safety Oil Engine is built by the De La Vergne Refrigerating Machine Company. Foot of East 188th Street, New York.

The best book for electricians and beginners in electricity is "Experimental Science," by Geo. M. Hopkins. By mail, #4, Munn & Co., publishers, 361 Broadway, N. Y.

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References to former articles or answers should give date of paper and page or number of question. In quiries not answered in reasonable time should be repeated; correspondents will bear in mind that some answers require not a little research, and though we endeavor to reply to all either by letter or in this department, each must take his turn.

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(6957) W. E. K. says: Will you kindly give me a recipe for preserving cider, in your Notes and Queries? A. Professional cider makers are now using calcium sulphite (sulphite of lime), instead of mustard and sulphurous oxide gas. It is much more convenient and effectual. To use it, it is simply requisite to add 1/2 to 1/4 of an ounce of the sulphite to each gallon of cider in the cask, first mixing the powder in about a quart of the cider, then pouring it back into the cask and giving the latter a thorough shaking or rolling. After standing bunged several days to allow the sulphite to exert its full action, it may be bottled off. The sulphite of lime (which should not be mistaken for the sulphate of lime) is a commercial article. It will preserve the sweetness of the cider perfectly, but unless care is taken not to add too much of it, it will impart a slight sulphurons taste to the cider. The bottles and corks used should be per fectly clean, and the corks wired down. A little cinnamon, wintergreen, or sassafras, etc., is often added to sweet cider in the bottle, together with a drachm or so of bicarbonate of gods at the moment of driving the stopper This helps to nentralize the acids, and renders the liquid effervescent when unstoppered; but if used in excess, it may prejudicially affect the taste.

(6958) H. R. S. says: Will you please publish the receipt for making a flour paste? A. T. A. Richardson, the architect, recommends to every 2 tablespoonfuls of the best wheat flour to add a teaspoonful of common moist or brown sugar, and a few drops corrosive sublimate; the whole to be boiled, and continually stirred to prevent getting lumpy, till of the right thickness. To prevent mouldiness, a few drops of some essential oil, as lavender or peppermint.

THE ENGINEERING INDEX. Vol. II. (6959) J. C. W. says: Would you be so 1892-1895. New York: The Engi-kind as to send me your formula for browning blue prints with tannic acid and canstic potash, which came out in your valuable paper, at your earliest possible convenience? A. Immerse the blue print after it is dried in a solution of aqua ammonia containing 22 per cent am. gas, 2 parts; distilled water, 18 parts. Leave the print in this solution from two to four minutes, or until the blue color entirely disappears, then rinse in clear water, and plunge in a filtered solution of tannic acid. 2 parts: distilled water, 100 parts. Keep in this solution about twelve hours. If not as dark as desired, intensify by adding to the bath a few drops of ammonia water. Take out after a few minutes and wash thoroughly. The prints resemble sepia drawings. A greenish tone may be given blue prints by immersing after washing in a 1 per cent solu-

> (6960) W. C. W. says: Will you please give me receipt for a good wine of coca? A. This is a French preparation. Its strength is about 1 in 30, and the dosea wineglassful. Coca wine is, roughly speak ing, about one-sixth of the strength of the official liquid extract (Extractum Cocæ Liquidum B. P., or Extractum Erythroxyli Fludium U. S.) To obtain the liquid extract, coca leaves are exhausted by percolation (which differs from either decoction or infusion) with proof

spirit. At the termination of the process the strength should be adjusted so that 1 ounce = 1 of leaves. The process of percolation is as follows: The leaves are placed in a vessel very like an elongated funnel, closed at its base by a porous diaphragm. This funnel fits into a receiver, and a small tube passes up its outer side and enters it near the top, forming a means of communication between the two. Spirit is now poured on the leaves, and the percolator closed. As the percolate filters slowly through into the reservoir, the displaced air passes up the tube, and so maintains an equilibrium in both vessels. The virtue of the coca leaves lies principally in the presence of the alkaloid cocaine. This, in the dried leaves, is supposed to exist as an inertealt, similar to many of the cinchona alkaloids in

(6961) M. H. R. says: I have a 12 inch reflecting telescope, 72 inch focus. What diameter and strength of concave lens is required to make an amplifier. or "Barlow" lens to be used with the telescope, to enable me to take photographs of the moon? And will it make any difference as to which side of the lens is put next to the eveniece? A. It will depend on the mount or tube of the telescope as to where the amplifier can be placed. The nearer the focus the smaller diameter it can be. As to focus, it will depend on how much amplification is wanted. The general size of a Barlow lens is 1 inch diameter and 6 inches focus. If it is correctly made for photographing, it will not make any difference which side is in.

(6962) H. S. writes: Some weeks ago there was published in your weekly an exhaustive article on the heat-resisting powers of different materials suitable for steam boilers and pipe coverings. I am in a dispute as to the merits of hair or asbestos covering. So I want to right myself before deciding. A. We give the relative values of different materials. We give following tests of Mr. G. B. Dumford, of Hamilton, Ont.

Combination of asbestos, hair felt, air space and wood.......100 Asbestos and hair felt and chopped straw, the straw mixed with lime putty...... 87 A plastic cement manufactured by parties at Troy, N. Y., with 1/2 inch half felt outside. 86.6 Paper pulp mixed with lime putty, 1 inch, covered with sheeting of wood pulp. ... 85 " cased with sheet iron...... 79 Loam and chopped straw sealed with wood.. 32 Fire brick 15 Red brick...... 12

(6963) F. F. says: Please be so kind as to inform me how to polish cattle horns. A. First scrape with glass to take off any roughness, then grind some pumice stone to powder, and with a piece of cloth wetted and dipped in the powder, rub them until a smooth face is obtained. Next polish with rottenstone and linseed oil, and finish with dry flour and a piece of clean linen rag. The more rubbing with the stone and oil, the better the polish. Trent sand is used in the Sheffield factories. It is a very fine and sharp sand, and is prepared for use by calcining and sifting.

TO INVENTORS.

An experience of nearly offly years, and the preparation of more than one hundred thousand applications for datents at home and abroad, enable us to understand the laws and practice on both continents, and to possess unequaled facilities for procuring patents everywhere. A synopsis of the patent laws of the United States and all foreign countries may be had on application, and persons contemplating the securing of datents, either at home or abroad, are invited to write to this office for prices, which are low, in accordance with the times and our extensive facilities for conducting the business. Address MUNN & CO., office SCIENTIFIC AMERICAN, 381 Broadway, New York.

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September 8, 1896.

AND EACH BEARING THAT DATE (See note at end of list about copies of these patents.

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Broiler, R. K. Lee. Building purposes, bearing rib for compression members for C. Steiner Bung, F. R. Butterfield	567,400 567,202 567,563
Onger	567,176
Buttons to cloth, machine for attaching, C. M.	567,313 567,529 567,269
Platt Camera, pavoramic, Angsten & Gesbeck Camera, roll holding, N. Crane. Candy, machine for cutting stick. T. Hough	567,559 567,559 567,297 567,392
Car coupling J. L. Liron	567,485 567,527
Car, band, H Small	567,362 567,544 567,487
Carswitch, automatic, C. Stadtfelt. Carpet sweeper. S. H. Ray mond. Carriage, W. F. Downey (reissue)	567,508 11,567
Car coupling, A. S. Weaver. Car fender, street, P. Hennessy. Car, band, H. Smail Car, partition, stock, W. A. Morton. Car storage arrangement, E. F. Mann. Car switch, automail, c. C. Stadtfelt. Carpet sweeper. S. H. Ray mond. Carriage, W. F. Downey (rejssue). Carriage curtain fastener, H. Higgin. Carriage seat. extensible, J. Murphy. Carriage seat. extensible, J. Murphy. Carriage packet, G. Luger. Cartridge packet, G. Luger. Cartridge packet, H. Pieper. Cash and package carrier catch, H. M. Weaver. Cash shecorder, D. J. Wilson	567,138 567,491 567,427 567,147 567,358
Cash and package carrier catch, H. M. Weaver Cash recorder. D. J. Wilson Centrifugal machine, J. L. Jonsson	567,180 567,431 567,273
Chain link, J. A. Steinmetz. Chain link, insertible, E. K. Roden. Chee se making, W. M. Turner Chopper. See Cotton chup per.	567,328 567,511 567,522
Churn, Board & Hyre	567,399 567,449 567,354 567,519
Cnurn, C. L. O'Kelley. Churn operating mechanism, Z. A. Taylor. Clear box. A. Tbalbeimer. Clear box of the	567,420 567,350 567,419 567,277
	567,137 567,181
Weldon. Clamp. See Cigar mould clamp. Jar clamp. Clasp. See Garment supporter clasp. Clothes line or wire tightening device, C. Truel- sen.	567,367
Clothon ain A Franct	567 393
Clutch or governor, automatic, H. L. Howe. Coffee berry bulling machine, A. D. Gomez. Coffee or tea percolator. V. M. Hawley. Coffee pot. E. J. Hepburn. Coin freed apparatus, C. Ingrey. Coloring matter, blue. A. Herimann.	567,467 567,387 567,235 567,239 567,567 567,146
Coloring matter, blue. A. Herrmann. Combination lock, J. F. Lockwood. Cuncrete tombstones, composition for, Belcher & Hendley. Cooking boiler. J. Mulligan.	567,562
Cooking boiler, J. Mulligan. Copy bolder device, A. R. Cook Corn bolding device, C. W. Stebbins. Cotton chopper, W. R. Jackson. Coupling. See Lar coupling.	567 490 567,221 567,284 567,345
Coupling. See Car coupling. Cowl, A. O'Brien. Crank. detachable, W. H. Williams. Crematory, garbage and excrement, F. K. Plumbly Crushing roll, T. A. Edison.	567,500 567,184
0 0 00'	567,506 567,187 567,173
Curb and gutter. G. A. & F. Schillinger	567,466 567,171
Cuspidor or waste basket support, C. C. La Riviere. Cutter. See Cigar tip cutter. Rotary cutter. Cutter bead, W. Munch. Cyanids, making, J. Raschen. Door aligner refeding O. T. Springer. 567,551,	567,275 567,545
Door enring (1 W Werner	567,552 567,570 567,329 567,121 567,443
Dress fastener for closing ladies dresses, w.	567 348
Luft Dress shield, I. Wormer Drier, Hall & Casper Dust collector, W. D. Gray Dust pan, A. V. Parker Dye and making same, brown diazo, C. Ris. Dye of rosindulin series, red, Herzberg & Hei-	567,285 567,386 567,341 567,357 667,413
Dye and making same, brown diazo, C. Ris Dye of rosindulin series, red, Herzberg & Hei- mann Electric current transformer, R. Thury	567,413 567,473 567,424 567,248
Electric current transformer, R. Thury 567247, Electric beater. J. E. Meek 567247, Electric light or telephone brackets. swing for A Peterelt	567 550
A. Petereit. Electric lock, W. S. Nash Electric machine, dynamo, R. Thury. Electrical transformer, H. M. Hobart. Electrical transformer, W. S. Moody. Elevator, T. W. Heermans. Elevator, N. P. Otis. Elevator buckets to belts, device for attaching. W. Grigcom	567,156 567,423 567,237 567,250 567,541 567,158
Elevator, N. P. Otis. Elevator buckets to belts, device for attaching. W. Griscom	567.469
End gate. wagon. G. Burket	567,183 567,534
Excavating machine, H. R. Keithley	567,274 567,530 567,287
Farrier's knife, F. M. Me Cartes	567,315 567,493 567,258
Fence, nood, W. Coangler Fence machine, wire, W. H. Campbell. Fence post, H. & L. C. Grant. Fence post, O. W. Whitebead.	567 383 567,123 567,385 567,557 567,142
Fence, D. C. Smith. Fence, flood, W. Cbandler Fence machine, wire, W. H. Campbell. Fence post, H. & L. C. Grant. Fence post, O. W. Whitebead. Fence it: bitener. wire, T. M. Kerns. Fence tool, wire, R. G. Kennedy. Fence, wire, R. G. Kennedy. Fences, ground base for Iron, H. Burster. Fender. See Car fender.	567,142 567,477 567,478 567,332
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Foot warmer, Rickard & Lowrie.	567,106
Fork F. Newton. Fuel feeder and distributer, L. Myers. Furnace. See Smelting furnace. Furnace, R. L. Walker. Furnace offtake, blast, Rottboff & Neeland	567,190 567,525 567,414
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Garbage, etc., process of and apparatus for treat- ing, S. E. Wilson. Garbage receptacle, K. Hirsch Garden rake, E. H. Snyder Garment supporter, R. W. Parramore. Garment supporter clasp, Thomson & Drever Gas engine, H. A. Winter. Gas lighting, luminous material for (neandescent, P. Barriere	567,195 567,421 567,432
Gas meter, coin freed, J Anderson	567,571 567,440 567,535 567,222
Gate, J. Clark. Gate, J. W. Cottle. Generator. See Alternating generator. Glass, means for working, H. Hilde Gold and silver from their ores, extracting, Pela-	567,222 567,236
Golfue appliance, D. Dalziel	567,503 567,455 567,148
Graining tool. W. S. Turner. Grindstone fixture, C. W. Pierce. Gunpowder, E. Dickson. Guns, breech closing mechanism for rapid fire, J.	567,523 567,504 567,536
Guns, breech closing mechanism for rapid fire, J. A. Deport. Hammeck supporting hook, I. E. Falmer. Harness, C. H. Kooper. Harrow, D. B. Smith.	567,224 567,280 567,244 567,321 567,196
Harness, C. H. Kooper Harrow, D. B. Smth. Harvester, E. A. Peck Hat, C. B. Halstead Hat rack, J. N. & Heber	567,196 567,234 567,169
Hat, C. B. Halstead Hat rack. J. N. & H. Rohr. Hay knife, I. B. Beekly Hay press. A. McIntosh Heater. See Electric beater. Heddle, L. Knecht. Hook. See Hammock supporting hook. Hook and eye, A. M. Weber. Hoop. See Ple tin boop.	567,406 567,396
Hook. See Hammock supporting book. Hook and eye, A. M. Weber	567,528 567,139
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Ice, apparatus for planing cakes of, J. N. Briggs	001,4400
(reissue) 1ce, device for grooving artificial, T. H. Flynn 1ce scraper, J. F. Lucas. 1ncandescent light, L. V. Thomas. 1nbaier, F. L. Wiseman. 1nkstand. C. H. Gardner. 1nkstand filling attachment, P. F. McClure. 1nsulated rail joint, Scofield & Wayland. Jar clamp, F. H. Palmer.	11,566 567,538 567,538 567,520
Inuaier, F. L. Wiseman. Inkstand. C. H. Gardner. Inkstand filling attachment, P. F. McClure Insulated rail joint, Scofield & Wavland	567,558 567,383 567,192 567,416
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