

BIT STOCK.—George Richards, Richland Center, Wis.—The object of this invention is to provide a brace or bit stock the handle of which is extensible, for obtaining more leverage when the resistance requires it. This is accomplished by forming the stock in three separate pieces and uniting them in such a manner that the grasp or handle can be extended at will.

APPARATUS FOR TOLLING GRAIN.—Wm. S. Widger and Wm. M. Read, Fairfield, Iowa.—This invention consists of a rotatory funnel provided with a spout which may be adjusted to the same fractional portion of the surface of the mouth of the funnel as the fractional part of the grain to be taken, which is arranged so that the grain must pass through it while it is in rotary motion, whereby an amount of grain equal to the fractional proportion of the spout to the funnel is diverted from the main portion and turned into a separate channel.

TRAMS FOR GAGING MILLSTONES.—Thomas R. James, St. Louis, Mo.—The nature of this invention relates to improvements in apparatus for framing or gaging the faces of the upper or running stones of grinding mills, and it consists in providing a tram brush which may be secured to the stone by the ends of the same being wedged into the recesses provided for the driver having a central opening through it vertically, provided with set screws wherein a shaft may be set with its lower end resting in the socket on the ball of the stone, whereby the said shaft may be nicely adjusted to a position exactly perpendicular to the face of the stone. On the upper portion of the said shaft may be arranged a swinging arm which is provided with one or more gage points.

STATION INDICATORS FOR RAILWAYS.—Elihu Spencer, Ottawa, Canada.—This invention relates to certain new and useful improvements in station indicators for railways, which improvements are more especially applicable to an implement for the above purpose, which was patented by the present inventor December 21, 1867.

LOCOMOTIVE SMOKE-STACK.—J. A. W. Just, Savannah, Ga.—The object of this invention is to provide a locomotive smoke-stack with such detailing devices that no coal, cinders, nor sparks, can pass through, and with the escaping smoke, while the draft is not in the least impeded.

GRIST MILL.—Bennet Whitney, New Brunswick, N. J.—The object of this invention is to construct a grist mill that the upper stone will be allowed to swing in either direction, and can at the same time be adjusted up and down; that no meal can escape through an upper opening in the curb; that the whole mechanism can be easily taken apart, without disturbing the bottom of the curb, and that the hopper and its shoe can be arranged on either side of the mill, as may be desired.

ELASTIC ROLLER.—Allen Magowan, Boston, Mass.—The object of this invention is to produce a roller for wringers and other machinery, on which the elastic will not slip on the mandrel, and which will be also durable and soft. The invention consists chiefly in forming an elastic core, by dipping a string into liquid raw india-rubber, and in then winding the string thus saturated around the mandrel. Thus a strong elastic core is produced, which will not slip on the mandrel, especially if projecting arms are formed on the mandrel. The invention also consists in the use of longitudinal tubing for winding the roller on a square handmill.

GRAIN CLEANER.—John E. Anderson, Bolling Springs, Pa.—The object of this machine is to accomplish the cleaning of grain in the most effective and perfect manner, and with the fewest and simplest arrangement of parts. It consists, in general terms, of a scouring wheel, revolving with high speed encountering the entering grain, and agitating it, thereby thoroughly loosening it from the chaff and cockle, and chaff. The grain is then delivered from this wheel, upon an inclined screen, when it encounters a blast of air from a revolving fan wheel or blower, located within the general frame of the machine, and immediately below the scouring wheel. The screen is not the plane surface heretofore used, but is corrugated in the form of steps running crosswise to the direction of the blast from the fan wheel, so that the kernels of cleaned grain will catch against the corrugations, and be retained from being blown out with the chaff.

LOOM.—A. W. Slivs, Birmingham, Iowa.—This invention relates to improvements in hand or power looms for weaving cloth, and it consists, first in an improved automatic picker motion; second, in an improved arrangement of harness operating mechanism; and, third, in an automatic take up apparatus, whereby a very nearly uniform tension is maintained on the cloth by means of a weighted take up lever, which is operated by the lay.

TRACE FASTENING.—F. W. Dean, Tremont, Ill.—The object of this invention is to provide a simple, efficient, and easily operated trace fastening. It consists of a link hinged to the single tree in such a manner that it will hold the trace from slipping off from the pin in the end of the single tree, and may also be moved away from the pin when the trace is to be slipped over the pin.

CARDING MACHINE.—Charles F. Morrison, Rifton Glen, N. Y.—This invention consists in providing carriers to receive the waste that falls from the feeding rolls, main card, and doffer, and carry it to a slipping roller, whereby it is returned to the carding rollers again and reworked.

HAMMER HATCHET.—T. S. C. Finn, Harrington, Maine.—The object of this invention is to provide a simple and convenient tool. It consists of a hammer having short claws, and a socket extension, all of one continuous piece of metal, in combination with a hatchet blade fitted to screw into the upper part of the chamber in rear of the claws. By this construction the hatchet blade is removable at will, or may be turned at right angles to its usual position, to enable the claws to catch the head of a closely driven nail.

FILTER AND HEATER.—R. R. Fenner, Urbana, Ill.—This invention consists in placing within the heater pieces of cast iron, by the presence of which in the heater the lime, which is in a fluid state, will at a certain degree of heat become crystallized and adhere to the pieces of iron to a great extent. The heated water is then passed through a filter which separates the balance of the lime.

COMPOSITION FOR BURIAL CASES.—J. R. Hathaway, Westfield, N. Y.—This invention relates to improvements in burial cases, and consists of an improved composition of matter for constructing the same either wholly or in part, or for ornamenting the same.

MACHINE FOR TWISTING JACK BANDS.—J. Collier, Morenci, Mich.—This invention consists of an arrangement of rotating hooks and a stationary hook for twisting the yarn, which are automatically thrown out of gear when the yarn has been sufficiently twisted; also a yielding twisting hook to which the yarns are transferred from the stationary hook to be finally twisted together.

TWEER.—O. G. Newton, Edinburg, Mo.—This invention consists of a ball valve, provided with cavities to receive the cinder, arranged on a rotating shaft having a vertically adjustable bearing whereby it can be raised and lowered to be rotated for the discharge of the cinder, and also for regulating the passage of air to the fire.

FRACK BASKET.—Henry Carpenter, Brooklyn, E. D., N. Y.—This invention consists in a novel manner of securing the bottom in the basket.

CURTAIN FASTENING FOR CARRIAGES.—Ephraim Shepard, New York City.—This invention relates to a new and improved curtain fastening for carriages, whereby a curtain may be readily fastened and unfastened, and be firmly secured in position when in a fastened state.

SULKY CULTIVATOR.—P. R. Tottam, Adams, Ill.—This invention relates to a new and improved sulky cultivator for cultivating crops grown in hills or drills.

STIRRUP.—John Bond, Versailles, Ill.—The object of this invention is to provide an improved stirrup with an oscillating bottom that shall be more agreeable to the rider, and which will, in case the rider is thrown from the horse, readily open and disengage his feet. It also consists in providing a swinging foot piece so connected to the pendant straps as to become disconnected when by any cause they are spread outward sufficiently, and for which purpose they are made sufficiently flexible.

WATER HEATING APPARATUS.—J. C. Ryan, Chicago, Ill.—The object of this invention is to provide an apparatus for heating water and circulating the same to obtain the greatest amount of steam heat or hot water from the fire of an ordinary stove. It is designed more particularly for shop and household use, though it is equally applicable in situations where it is desirable to econ-

mize fuel and utilize the heat of one stove for warming other parts of the building.

HAY ELEVATOR.—F. A. Crane, Zanesville, Ohio.—The object of this invention is to facilitate the operation of lifting hay from the wagon and discharging it into the hay mow or a barn. It also consists of a plank or board provided with internal rails affixed on each side of the lower edge of the said plank, and on which a hanging truck and its accessory apparatus travels to and fro. The hanging truck is provided with pulleys and rollers, and a catch lever, the latter being so arranged with reference to the accessory parts of the apparatus that the truck will be held stationary until the hay is lifted to the proper height, when the catch lever will be lifted, and the truck with its suspended load of hay will be free to be drawn along the rails to a position over the hay mow into which the hay is to be discharged from the fork.

BEE HIVE.—Benjamin Leckrone, Somerset, Ohio.—This invention relates to several improvements in the construction of bee hives, whereby the entrance of the bees to, and their movements and operations in the hives, can be perfectly regulated and controlled; and whereby the hive can be more conveniently handled, and will be better adapted to secure the health and comfort of the bees, than any hitherto in use.

HOT BLAST FURNACES.—P. and R. Hoop, Berlin Cross Roads, Ohio.—This invention consists in passing the blast of air to be heated for fanning the flame of a puddling furnace through a series of hollow rings placed one above another, in a chimney, the products of combustion beneath rising through the rings and the blast circulating in the rings one after another, said rings being connected by means of pipes for the transmission of the air current from one to another, which pipes pass outside of the chimney, and are arranged to be removed and replaced at pleasure.

HORSE HAY RAKE.—Solomon C. Brinser, Middletown, Pa.—This invention consists in locking the head of a horse hay rake by means of a simple toggle arrangement, in such a manner that it cannot rotate to any degree upon its bearings, but is compelled to bear the teeth steadily forward without change of elevation, as in raking over uneven ground; also, in converting the before-mentioned locking mechanism into an arrangement of parts for tripping the rake head to avoid stones or the roughness of uneven surface, said tripping arrangement being operated by means either of a hand or foot lever.

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 the correspondent 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 \$1.00 a line, under the head of "Business and Personal."

All reference to back numbers should be by volume and page.

J. M. C., of Pa.—Your suggestion about the use of a current of water passing through a tube to assist in propelling a boat is very old.

H. F. R.—We know of no good cement that will resist water, and which is adapted to join glass and wood, that is at the same time elastic to any extent.

J. N., of Ala.—In our opinion the statement that common salt put into a kerosene lamp, will prevent the explosions which often take place in the use of bad oil, is incorrect.

J. R., of Mo.—We advise you to send for Henry Carey Baird's catalogue, of which we give a notice this week. By an examination of the contents of the books as therein described you will be able to make a judicious selection of the books you need.

R. M., of Mo.—The star you see is called Aldebaran. It is in the constellation Taurus—the bull. It forms the eye of the ball as pictured on astronomical maps. It is a star, not a planet. The glass of which you speak will not probably enable you to see the rings of Saturn, much less his satellites. You can, however, see interesting objects on the moon's surface with it and also the moons of Jupiter.

J. M. D., of Mass.—"Why will a small dry needle float on the surface of water?" Water although a liquid still has a certain amount of cohesive force. This force is sufficient to prevent the breaking of the surface by the weight of a small needle provided it be dry and laid very carefully upon the water. "Why will smoke from a locomotive form rings as it issues from the smoke stack in damp weather?" The dampness of the weather has nothing to do with it except that there is apt to be less wind in damp weather than in dry, and the smoke is more apparent. Gaseous volumes puff suddenly from the mouth of a tube often assume the form of rings, common examples of which are the smoke from a cannon in a still morning, or the rings of tobacco smoke projected from the mouth held in a proper manner.

A. B., of St. Petersburg, Russia, sends us a paper on boiler explosions comparing one of the theories of Mr. Norman Ward—that of unequal temperature.—For a native Russian the letter, written in English, is very creditable, but the ideas advanced are neither new nor useful; they have been more than once published in our columns.

B. C., of S. C.—Your theory of belts is valueless. Belts cannot, in anyway increase power. They are only the transmitters of power, and as such, standing between the source and the result, necessary evils.

J. P. G., of R. I.—The amount of surface of a pulley embraced by a belt is not an essential element of calculation in estimating the amount of power it may transmit. A belt that merely impinges upon a pulley may be as effective as though it came in contact with two thirds of its circumferential surface.

W. M. L., of Mass., asks if a thread of a pitch eight to the inch would be too "heavy" for a three quarter inch shaft. If he means a bolt to resist a strain or for securing two portions of a structure, such a grade would undoubtedly detract from its strength; but it might be used in some cases, as for a worm or a feed. A three quarter inch bolt should not receive a heavier thread than ten to the inch. See articles in back numbers of the SCIENTIFIC AMERICAN relative to the American system of bolts and nuts.

B. F., of Tenn.—Stone drills should not be finished by the file before hardening. We know it is a common practice, and that cold chisels are sometimes so prepared. The practice is, in either case, not to be recommended. The grindstone is the proper tool for the purpose.

S. F. M.—Yellow rays have so actinic effect upon sensitive plates; hence photographers use deep yellow glass through which to admit light into their operating rooms. Glass is the best material for the sensitizing bath.

T. D., of N. J.—The buoyancy of your immersed buckets is the same whether open or closed; their position has nothing whatever to do with the force with which they seek the surface.

W. J., of Nebraska.—No experiments yet tried give data for an answer to your query. An experiment made with a special view to determining it would be of value. You can easily try it for yourself, and we should be glad to learn the result.

W. W., of Ohio.—The substances used for rendering clothing water-proof, are either ordinary oil paint, or varnish, very liable to crack, or what is much better, india-rubber dissolved in benzene. For this purpose pure rubber is required. Some other processes are used, but would not be available to you, as they are either kept a secret, or are expensive.

J. D. C., of Mo.—"Can the bearing of a shaft of wrought iron 5/8 inches in diameter, if found to be turned slightly too small, be made a

good fit by heating it in a common blacksmith's fire and allowing it to cool? Second, Can a locomotive driving wheel be pulled on tight enough before the tire is on with an inch and one eighth bolt and a 3/4 foot wrench, supposing the taper to be one sixty-fourth of inch." Answer to both questions No.

NEW PUBLICATIONS.

GENERAL PROBLEMS OF LINEAR PERSPECTIVE OF FORM, SHADOW, AND REFLECTION. By S. Edward Warren, C. E. John Wiley & Son, No. 2 Clinton Hall, Astor Place, New York city.

We have before had occasion to refer to the publications of Mr. Warren, and his abilities as an instructor, and always favorably. His published opinions are received throughout the country as decisive, and his books are the textbooks of the student who desires to become acquainted practically with the principles of the science and the practice of the art of geometry. In this, his latest volume, Mr. Warren has fully sustained the characteristics of his former publications and laid our students under additional obligations. Whatever he does, either as an instructor or writer, he does well, and he has already made his name the synonym for exactness, as his labors as a teacher have made him successful.

THE TROTTERING HORSE OF AMERICA; How to Train and Drive Him. By Hiram Woodruff. Edited by Chas. J. Foster, of *Wilkes' Spirit.* J. B. Ford & Co., Printing House Square, New York city.

All who ever drove or owned a horse, or witnessed a trial of speed with any gratification whatever, will be interested in the book whose title we have given above. To Robert Bonner, we are told in the dedication, belongs the credit of instigating the preparation of the paper which forms the body of the book, the reminiscences of Mr. Hiram Woodruff, whose opinion on horses is received as authority the world over. Mr. Bonner has offered another proof of his interest in that noble animal, the horse, beside his purchase of the fastest trotter in the world, by his suggestion of this collection of Woodruff's instructions and reminiscences. A very life-like and correct vignette of the great horse trainer embellishes the volume. All who are interested in horse flesh should procure this book.

CATALOGUE OF PRACTICAL AND SCIENTIFIC BOOKS, Published by Henry Carey Baird, Industrial Publisher, No. 406 Walnut street, Philadelphia.

In this catalogue over one hundred and eighty different departments of science and the arts are represented. Mr. Henry Carey Baird is probably the most extensive publisher of such books in the United States, and his catalogue will be of value to all such as seek a guide for the selection of books adapted to their special wants, either as manufacturers, engineers, inventors, or mechanics. The publication of the contents of each book enumerated in the list will enable any one to judge of its value. The catalogue is sent free of postage upon application.

Business and Personal.

The charge for insertion under this head is one dollar a line. If the notices exceed four lines, an extra charge will be made.

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Boston safety faucet, self closing. For wash basins, hopper water closets sinks, urinals, and water jars. Special adapted for depots, steamboats, hotels, public buildings, and all places where water meters are used. Joseph Zane & Co., 81 Sudbury st., Boston, Mass.

Four patents for sale. Address F. Van Dorlen, patentee, Adrian, Mich.

Wanted—a foreman in a wood shop near New York city, in which six to eight hands are employed. Must be accustomed to the use of wood working machinery on hard wood. Address box 6173, N. Y. postoffice.

For sale—patent right of McCreary's carriage clip, illustrated No. 13, present volume, Scientific American. Address T. McCreary & Co., Matteawan, N. Y.

C. J. Fay's patent water proof roofing, Camden, N. J.

For sharpening all kinds of woodsaws, beyond anything heretofore known, inclose 50c., and address E. Roth, New Oxford, Pa. Thousand of mechanics now use it.

Painters' Manual, concise, comprehensive, and practical. 50 cents by mail prepaid. Jesse Harney & Co., 119 Nassau st., New York.

For solid wrought-iron beams, etc., see advertisement. Address Union Iron Mills, Pittsburgh, Pa., for Lithograph, etc.

Peck's patent drop press. Milo Peck & Co., New Haven, Ct.

For sale—a complete set of the "Scientific American," neatly bound in 2 1/2 mor., with marbled sides, (31 vols.) old and new series. Also, odd volumes. Address L. M. Montgomery, Box 2953, New York.

Wanted to know where to obtain a reliable liquid meter for registering petroleum. Address H. W. Faucett, Petroleum Center, Pa.

A. H. Scott, Concord, N. C., has a valuable new patent for sale, and wishes to communicate with dealers in patents in the several States. Inventors and owners of small patents send circulars to postoffice box 111, Peekskill, N. Y.

The pew hat rack.—County rights for sale. Send for circular to E. S. Blake, Pittsburgh, Pa.

Millwrights can make favorable arrangements for sale of best water wheel in use. Address Peekskill Man'f'g Co., Peekskill, N. Y.

For sale—barrel machinery, nearly new, for whiskey and coal oil barrels. Address postoffice box 290, Cincinnati, Ohio.

For Blanchard's spoke lathes, address Exeter Machine Works, Exeter, N. H.

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