coarse silk cloth, such as commonly used in the place where the wire is placed in this case, so as to provide a space between it and the wire, and designed for the reception of the coarse bran or feed which will thus be separated from the hulls of buckwheat when grinding this grain, and be delivered into a receptacle over which the hulls are chuted and discharged to another receptacle, the object of which is to provide a bolt by which feed may be obtained separate from the hulls, which are injurious to animals, and which will, at the same time, be suitable for bolting the meal of other grain.

PACKING THE PLUNGERS OF STEAM PUMPING ENGINES.—John Clark, Harrisburgh, Pa.—This invention is intended to be an improvement upon the well-known Worthington & Baker steam pumping engine, and consists in the application of an adjustable packing, constructed so as to compensate for wear, to the central transverse partition of the barrel of such an engine, through which the plunger plays.

METALLIC ABUTMENT FOR BRIDGES.—A. Wheelock, Fort Wayne, Ind.—This invention relates to a new metallic abutment for bridges, constructed in a novel and improved manner.

NUT LOCK.—Maurice Langhorne, Washington, D. C.—This invention has for its object to prevent the turning back spontaneously of a nut after it has once been screwed on its bolt or axle as tightly as may be necessary in order to clamp the material through which the bolt or axle passes.

STEAM PUMPING ENGINE.—William H. Roberts, Mauch Chunk, Pa.—This invention has for its object to make the stroke of the piston of a steam pump uniform as to speed throughout.

KINDLING WOOD ELEVATOR.—James E. Kelsey, Brooklyn, N. Y.—This invention has for its object to furnished an improved elevator, designed especially for elevating kindling wood in the factory where it is prepared for market.

ADJUSTABLE PLOW BACK BAND HOOK.—John Seaman, New York city.—This invention has for its object to furnish an improved plow back band hook, which shall be so constructed that the length of the back band may be easily adjusted according to the size of the animal upon which it is to be used or to regulate the pitch of the plow, and which shall, at the same time, be so constructed that it will not become accidentally unhooked or catch upon the trace of the other horse.

RUBBER MOLDING.—William Miller, Boston, Mass.—This invention has for its object to furnish an improved rubber molding, which shall be so formed as to adapt it for use around windows, doors, etc., as weather-strips, to prevent the wet and cold from finding their way in around said doors and windows.

MEDICAL COMPOUND.—George V. Sheffield and John A. Sheffield, Northbridge Center, Mass.—This invention has for its object to furnish an improved medical compound, simple in its composition and preparation, and effective as a blood purifier, and a sure remedy for many diseases, such as scrotula, salt rheum, dyspepsia, liver complaint, worms, jaundice, etc.

SHINGLE MACHINE.—Wm. H. H. Palmer, Rockville, R. I.—This invention relates to certain improvements in that class of shingle machines in which the blocks to be cut are held in a rotating frame, and exposed to the action of horizontal circular saws. The invention consists in various details of construction, whereby the blocks are brought into the proper alternate inclined positions, and caused to be firmly clamped while being sawed.

SKEIN WARPING MACHINE.—Samuel Campbell, Palmer, Mass., and Duncan McFarlane, Troy, N. Y.—This invention relates to a new machine which can be used to lay the yarn in skeins or in separate threads around the section-beam. The invention consists chiefly in the application of a traversing bugle or guide, which collects all the threads into a single skein, to apply the same to the section-beam. This bugle, however, and its appurtenances are removable, and when they are taken off, the machine may be used to apply the yarn in separate threads, as on the ordinary warping machine.

WHIFFLETREES AND TRACES.—J. V. Norton, Plainville, N. Y.—The object of this invention is to provide a convenient construction of harness, wherewith to connect the ropes of hoisting apparatus, such as derricks, horse hay-forks, etc., with the draft animals.

HARVESTER.—J. B. McCormick, Dayton, Ohio.—This invention has for its object to improve the construction of the kind of reapers which are so constructed that the grain may be bound before being dropped from the machine, so as to make them simpler in construction, and more effective and satisfactory in operation than when constructed in the usual manner.

SAW SET.—H. A. Harris, Center, Texas.—This invention relates to a new implement which can be used for setting the teeth of all kinds of saws, by hand, and without requiring any intricate machinery.

SPRINGS FOR CARS, ETC.—C. M. Banks, Roxborough, Philadelphia, Pa.—This invention will soon be illustrated in the SCIENTIFIC AMERICAN.

FEED CUTTER AND THRASHER.—Norman McLeod, Clio, S. C.—This invention relates to new and important improvements in the machine for which a patent was granted to the same inventor, November 10, 1863, No. 83,984, which said machine is designed for use either for straw or feed cutting, or for thrashing grain, and comprises certain improved arrangements of a feeding trough, feeding rollers, and revolving cutters, working across the end of the feeding trough, and in a large case for controlling the cut straw and delivering it through a spout.

NEEDLES.—Robert J. Roberts, 416 Broadway, New York city.—This invention relates to improvements in sewing needles, and consists in providing the said needles, which are commonly made of steel, which is very liable to damage by corrosion, with coatings of non-corrosive metal, such as gold, silver, copper, or tin; the said metals being applied to the needles after they have been otherwise finished, by the common and well-known methods of gilding, plating, or tinning.

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 advertisemets at $1·00 a line, under the head of "Business and Personal."

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

W. M.—The Hudson River railroad is 144 miles long. There is a flagman for each mile, charged with the duty of examining the track after the passage of every train. It is one of the safest roads in the country. The resistance in moving a tun weight upon a level railroad is one four-hundredth of that load, or, say, 5 pounds. This is realized at slow speeds, and if the construction of track and wheels were mechanically accurate, the above resistance would be constant at all speeds. But so defective is the average construction that, at high speeds, the resistance is found to be 30 pounds and over. The reason why the Erie railway trains are so irregular, is because of the wretched condition of the track. The trains lose from two to five hours on the schedule time in passing over the whole length of the road.

R. C. P. B., of Pa.—No exact ratio between the diameter of a circle and its circumference has ever been discovered. The ratio of 7 to 22, is, however, near enough for many purposes.

A. S., of Iowa.—Annealing depends, like hardening, on molecular changes not yet fully understood. The why of many things cannot yet be answered.

S. W., of Ind.—Bricks do not increase in weight by the process of burning.

H. W., of N. Y.—A good rule in setting boilers in regard to the distance of the bridge walls, is to have the extremities of each 3 inches from the boiler. Then let the bridge walls retreat from the boiler uniformly, so that their distances from the boiler measured halfway between the extremity and the middle of the wall, multiplied into the entire length of the curve, shall give an area of 36 square inches for each square foot of grate surface for the first bridge wall, 24 square inches for the second bridge wall, and 20 square inches for the third. This when three bridge walls are used. In all cases the last bridge wall should be at the same distance from the boiler, so that if one is omitted it is the one giving the greatest area; if two, the ones giving the two greatest areas.

E. B., of Mass.—The Portland cement concrete made in the same proportions as the concrete for building, will make a good cellar bottom. There will be no danger of fire from the registers of a hot-air furnace, unless they are closed so that no air passes through. In such cases they may sometimes communicate fire to the surrounding woodwook. The registers of a furnace should never be all closed at once when a fire is burning. An iron tube well sunk near the foundations of a heavy building, would, we think, if the water flow and demand were large, be apt to cause sinking of the foundations.

M. H. S., of N. Y.—The widths of belts to drive a given horse power depends on their velocity and the surface of contact of the belt with the smaller pulley. These data you do not give, therefore your question cannot be answered. We know no such wheel as a *pitch-back* water wheel. The power required to drive a saw depends upon many conditions not one of which you give. You might just as well ask "how large is a piece of chalk?" You ought to secure the services of a practical mill-wright if you wish to save money and time.

R. J. P. G., of N. H.—The nature of magnetism is not yet understood. Nobody knows why certain bodies are magnetic and others are not, or why bodies under certain circumstances become magnetic and again lose their magnetism. The most that is known is that magnetic phenomena uniformly occurs under certain circumstances. All beyond this remains yet a *terra incognita*.

J. S., of Pa.—The cement called "marine glue" will unite leather to gutta-percha and is impervious to damp. It is made by dissolving by the aid of heat, one part of india-rubber in naphtha, and when melted, adding two parts of shellac, and melting until mixed. Pour it while hot on metal plates to cool. When required for use melt and apply with a brush.

J. H. B., of Mass.—We recommend a wire of aluminum bronze as combining in the greatest degree the qualities of strength, ductility, and cheapness. We do not think it is made in this country, but if you understand wire-drawing, and have facilities, you can make it for yourself. The alloy is nine parts aluminum and ninety parts copper.

R. L. A., of N. C.—The old idea of caloric as a material substance pervading bodies and enveloping their atoms, has been long abandoned by scientific men. You will find more modern and philosophical views in the writings of Tyndall, Grove, Helmholtz, and many others upon heat. We respectfully decline your communication.

E. C. C., of N. Y.—Any well-tempered spring not overtaxed will retain its strength an indefinite length of time. No spring should have a load sufficient to permanently "set" it. Flat coiled springs are the most convenient for driving wheel work.

H. R. A., of Conn.—The spring and the weight are the only mechanical depositories of power which retain their power for indefinite periods, and when released expend it, if we except such as require chemical action to release their imprisoned energy.

C. D. S., of N. Y.—Tin and lead in equal parts makes a good soft solder. Easier of fusion is a solder made of equal parts of tin, lead, and bismuth. For soft soldering brass tinfoil may be used and makes a good joint. Care should be taken not to employ too great heat.

C. B., of N. Y.—An excellent cement to mend cut leather is as follows: 1 pound gutta-percha; 4 ounces india-rubber; 2 ounces pitch; 1 ounce shellac; 2 ounces of oil. Melt the ingredients together and use hot.

C. C., of N. Y.—The periods of artificial incubation of different kinds of eggs are the same as when incubation is performed by the parent bird.

B., of N. Y.—Ornamental iron bars with spiral or undulating lines, are made by rolling between a pair of rollers, the axis of one roller being set at an angle to the axis of the other

S. C. S., of Mass.—We know of no process by which you can make the rusty heads of screws bright again without injury to other parts of the screws, except by repolishing.

W. S., of Iowa.—Your letter and diagram of circles observed about the moon are interesting, but possess hardly enough novelty to warrant publication.

E. C. A. of N. Y.—Black pins are made black by japanning. The japan is made by mixing drop ivory black with anime varnish. The pins are dipped in this and the coat is baked on in an oven.

G. C. H., of Mass.—We know of no cement which will unite leather while damp and hold it strongly.

B. H. H., of Ind.—Boilers do not always explode at the top Neither, in our opinion, do they burst from the generation of gas other than steam, which is a gas to all intents and purposes. Boilers may doubtless be sometimes strained almost to bursting by unequal expansion, but in the majority of cases steam does the work of destruction on boilers weakened by neglect or inherently weak from faulty construction.

W. D. Beecher, of Mass.—You should introduce your blower about half way between the bottom of the ash pit and the grate of your boiler furnace. If the blast is properly introduced into the chimney, provided the volume of air is sufficient, it will add about one half to the draft, but it will be much more efficient applied under the grate.

M. M., of Va.—Mink and other skins are dressed in this country before being made up. We presume this is done more or less by all large fur dealers, but we are not acquainted with any furrier that makes it a specialty.

R. A., of N. C.—A steam engine may be made to assist a water wheel when water is low by belting on to a pulley on the first line of shafting, but the water wheel would hardly take the place of a fly-wheel.

J. S. D., of N. H.—We cannot adopt your suggestion to star each new advertisement. All advertisers must be treated alike, and we wish our readers to read the advertising columns each week from beginning to end.

H. M. & Co., of Ohio.—We do not think that arching over your boiler with brick so as to lead the flame and heated products of combustion over its entire surface, adds directly to the danger of explosion, but by concealing leaks and hiding from view the condition of the boiler, it does so indirectly. Besides, as a measure of economy, it is not good practice to so set a boiler. It is well to cover the top of a boiler with some non-radiating substance, easily removed when necessary, of which felt is undoubtedly the best though more expensive than some other substances that will answer quite well. Sand or coal ashes are used often, and there are some patented compositions in market which are quite cheap, and which are more or less effective.

Inventions Patented in England by Americans.

[Compiled from the "Journal of the Commissioners of Patents."]

PROVISIONAL PROTECTION FOR SIX MONTHS.

159.—LOOM FOR WEAVING.—Isaac E. Newton, Waterbury, Conn. January 19, 1870.

182.—NEEDLES AND NEEDLE ARMS FOR SEWING MACHINES.—Mary P. Carpenter, San Francisco, Cal. January 20, 1870.