

HORSE HAY FORK.—M. D. Birge, Grand Rapids, Mich.—This invention relates to a new manner of operating a horse hay-fork of that class in which a spirally shaped tine is used.

SUSPENSION BEAM SCALE.—C. E. Gage, Fond du Lac, Wis.—This invention relates to improvements in a suspension beam scale for weighing heavy weights and grain in bags and consists in attaching a bag holder to the beam for weighing grain and a device for balancing the scale.

WOOLEN LOOMS.—Chas. Schilling, Auburn N. Y.—This invention relates to a new and improved mechanical device for effecting the shed motion in power looms for weaving woollen goods, and consists in the arrangement of reverse cranks upon the driving shaft to work the piston rods which operate the jacks in the place of the more complicated arrangement of separate cranks and connecting rods.

HOISTING APPARATUS.—William Rung, New York City.—This invention relates to a hoisting apparatus in which by an endless chain motion is imparted to a shaft, on which an endless screw is arranged, which meshes into a worm wheel, that is mounted on another shaft. The latter is connected by differential gearing with two shafts, on which the drums, over which the endless hoisting chain passes, are mounted.

SHEEP SHEARS.—George Hilgar, Brownington, Pa.—This invention relates to a new manner of attaching and operating the third or center tine of sheep shears, and consists in arranging all the parts, that the said third tine can be easily secured to sheep shears of ordinary construction, those having but two tines, and so that the said third tine can be easily removed if desired.

RIDING ATTACHMENT FOR PLOW.—Lorenzo Doming, Ottawa, Ill.—This invention relates to a riding attachment which is capable of having any ordinary tillage plow attached to it. The invention consists in a novel manner of connecting the plow to the riding attachment, and in a peculiar construction of the latter whereby it is believed that several advantages are obtained over the ordinary riding attachment in use.

TRACE FASTENER.—E. F. Lacy, Danville, Ill.—This invention consists in a novel combination and arrangement with the frame of such buckle of a clasp and spring to the wedge, whereby all possibility of the wedge becoming separated from the buckle is entirely obviated, and the working forward of the trace strap, when it is slack wholly prevented.

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 50 cents a line, under the head of "Business and Personal."

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

D. M., or O. asks why elongated shot go endwise when the text books of physics teach that a rotating body will revolve about its shorter axis? Of course the question has reference to rifled projectiles whose rotating movement is due to the spirality of the gun's grooves, so far as the principle quoted affects the question. Elongated shot from a smooth bore do not always go, or rather strike endwise. If fired from a distance so short that the shot pursues a nearly direct line the shot would be expected to strike end on; but if fired at an elevation so it describes a curve, the longer axis of the shot has a natural tendency to pursue the right line and the further this is departed from the more liable the shot is to strike in some other manner. A simple diagram will readily show this. The subject, however, is one involving several principles whose relative bearings on the result are not yet clearly understood.

M. B., of Mich.—We have never yet heard a satisfactory explanation of the cause of the delicious weather which prevails in this latitude at the season known as Indian summer.

E. B., of Kansas.—The only way to keep writing ink thin with which we are acquainted is to protect it from the atmosphere. The air not only evaporates it but oxidizes it and renders it thick. Those inkstands which have a tapering tunnel in the mouth will preserve the ink in its normal state much longer than the ordinary kind because less of the surface is exposed.

J. J. T., of N. J.—We believe the author of "Vestiges of Creation" is not publicly known. The book is supposed to have been written by the Chambers, of Edinburgh, Scotland. Its theories are not generally accepted by naturalists of any note.

T. S. S., of Wis.—The band saw is simply an endless saw of thin, flexible steel which runs over pulleys or rollers just as ordinary belts of leather. We believe we once illustrated a band saw.

W. M., of Pa., would like some correct rule to estimate the power of a non-condensing or high-pressure engine, as he finds in the text books rules for low-pressure engines only. He asks that the rule be published, and gives the following as an example: High-pressure, horizontal engine, diameter of cylinder, 12 inches; length of stroke, 20 inches; revolutions per minute, 95; pressure in boiler, 90 lbs.; length of steam pipe, 36 feet. Ans: We have often given the rule asked for, but will repeat it. Multiply the area of the piston by the average pressure in the cylinder—not the boiler—and that by the number of feet the piston travels per minute; divide the product by 33,000 and the result is the horse-power. You can ascertain the actual pressure of steam in your cylinder only by the indicator. If you have 90 lbs. during the full stroke the power of your engine is 97.2 horse-power. If you know the effective power in your cylinder multiply it by 1.08 and the product will be the horse power.

L. D. G., of Mass., asks "what is the composition of 'white metal'?" We apprehend that the term is not a specific one. It is used in a general way by artificers, some understanding by it one composition and others another. German silver and other compositions of copper and zinc are called "white metal." A mixture of copper 4 lbs., and tin 3oz., of copper, 10, and zinc and nickel 5 each; of tin, 100, antimony, 8, copper, 4, and bismuth, 1, and several other compositions each produce a white metal.

G. W. H., of N. Y., and J. B. C., of Mich.—It is doubtful if any simple process is known by which hard castings of the differing qualities of iron can be certainly and unfailingly annealed. In practice we have found that packing the articles in a cast-iron box with powdered lime, or lime and iron borings or forge scales together, and luting the cover with clay, then exposing it to a steady heat (red heat) for several hours was quite effectual. Of course the cooling process must be very gradual.

A. W., of N. Y.—The Armstrong gun if of small size is a breech-loader. The large guns are muzzle-loaders.

C. P. P., of Kansas says "It frequently occurs that the flues of boilers using the water of the Missouri become perforated in spots from the size of a pea to that of a silver half dollar. This applies more particularly to those in mills on the banks, while the boilers in the boats are not affected in the same manner." We can give no reason for this peculiar action of the water, but have noticed it in our experience. We have known a set of tubes in a heater rendered useless in two years from this cause, while precisely similar ones in other places, where the same water was used, lasted six years. Perhaps some of our practical correspondents can give an adequate reason.

L. T., of Pa., asks "What proportion of a steamboat does the machinery, including the boiler, occupy?" We are left to guess whether

the proportion referred to means space or tonnage, whether the boat is a propeller or side wheel, etc. Of course a categorical reply is out of the question. We publish this inquiry as a specimen of many others received weekly, which are thrown aside without reply, simply because the writer has not given us the data we should have. Be explicit if you expect a reply.

M. W., Jr., of La., hopes we may continue our articles on boilers, and especially give some information on setting boilers. He is about putting up a nest of double-flue boilers and desires information. In No. 9, of Aug. 31st, current volume, first page, you will find the knowledge required. The only alteration advantageous to him in burning bituminous coal, is to enlarge the air pipe behind the bridge wall to about eight inches.

C. A. M., of N. Y.—Suppose a piece of iron a foot, more or less, square, with a round hole of one inch in the center heated red, will the hole become larger or smaller by the expansion? We think, larger. 2. Suppose the external dimensions of the piece to remain the same but the size of the hole to be greatly increased. Would the same answer be applicable to this second condition? We see no reason why it should not.

J. F. R., of Vt.—The best paint for boilers we know of is asphaltum dissolved in spirits of turpentine over a gentle fire. Pulverize the asphaltum and dissolve as much as will be taken up by the turpentine. If pure it will last.

R. C., of N. Y., asks what favorable inducements are held out to practical men—mechanics—to settle in Virginia or other Southern States. We know of no peculiar inducements different from those afforded by climate, soil, natural productions, and locality. In these respects some of the other Southern States are perhaps superior.

J. G., of Me.—The making fac-similies of the impressions of coins and medals for exhibition is not prohibited by law. But an attempt to imitate all the qualities of a coin so that the copy might be used for money, would come within the law against counterfeiting. The most perfect way of copying the impressions of medals and coins is by the use of the galvanic battery.

B. L., of Ill.—We know of no better way of brightening the brass of an engine than the use of friction with rotten stone and oil, drying off with whiting or lamp black. Vinegar or a weak solution of oxalic acid followed by whiting is often used, but not with so great economy.

W. J. C., of Ind.—We have no faith whatever in the virtues claimed for the divining rod.

J. M., of Kansas, is washing woollen goods with a very hard water, "so hard that it renders the timbers of a dam in the stream as white as though they were whitewashed." He also says: "The bottom of the creek is solid lime stone; small coal veins crop out in the water and a green scum forms on the top during dry, hot weather." He has used soda ash to soften the water, and potash soap in washing. But the results are all unsatisfactory; the goods refuse to become clean. The impurity of the water is probably mainly, sulphate of lime, which would be precipitated on heating the water to its boiling point. All lime salts may be precipitated by adding to the water a solution of oxalic acid or oxalate of potash. The water, however, appears to be somewhat extraordinary and we recommend that a chemical examination be made of it.

J. A., of W. I.—Notwithstanding all that has been said in praise of amorphous phosphorus it appears not to have come into use. The increased trouble and expense of using it seem with the manufacturers to outweigh the considerations of safety to the workmen. You need no special receipt to enable you to use it in the manufacture of matches. Use it with the same materials you employ with ordinary phosphorus.

J. B., of Md.—There is no simple test of lubricating oil so good as the actual trial by an experienced observer. The total virtue of oil is made up of a great variety of independent properties, most of which require special tests. A perfect lubricating oil would have just sufficient viscosity to keep the axle and bearing from coming in contact, would be unaffected in consistency by changes in temperature, would be involatile, and would not change from chemical causes.

J. H., of N. J.—We suggest that you send an account of your supposed discovery of errors in astronomical data to Prof. Loomis, of Yale College, who will probably give you useful advice. Your polite communication in its present form is not available for this paper.

J. R., of Iowa.—Consult Wise on Ballooning for the information you seek.

W. H. H., of Ill.—A process for procuring soluble alumina at a cheap rate is certainly desirable. There would be no difficulty in finding sale for the article. The prejudices of those who use the salts of alumina would not stand long against their pecuniary interests. But remember that the soluble alumina must be afforded at a cheap rate.

J. T., of N. Y.—The magneto-electric light has been used for making photographs, but as yet only in an experimental way. There are however, reasons for believing that the light will be so economically produced that it will come into extensive use.

Engineer.—You will find reliable information on the value of hydro-carbon fuel in Ronalds & Richardson's Technology, Gmelin's and Miller's Chemistry and Balfour Stewart's Treatise on Heat. In the last two, are descriptions of the apparatus and processes used in the determinations.

I. S., of Kansas.—The mineral you send is plaster of Paris; the crystallized variety is called selenite. It is used for manure and for stucco work. We know of no special treatise on the mineral.

J. P. O. makes us wade through three written pages as a prelude to a simple inquiry about the inventive rights of employes which is answered in our little book of instructions but which we cannot send as he gives no address. If long-winded correspondents would place their inquiries first and the preface last, it would save us much time.

Business and Personal.

The charge for insertion under this head is 50 cents a line.

Isaac J. Bogert, Fayette, Iowa, is the inventor of an improved tool. They are wanted in every saw mill in the country. Small capital only required to make them. Also, a new cheese press. Every farmer needs it. Thousands of these improvements can be sold, and he thinks there is a fortune in each. He wants to make arrangements with parties who are willing to put in a small amount of money to make and introduce these inventions. Address, by mail, as above.

All Patentees of Stone-drilling Machines send their address, with illustrated circular, to Geo. Phillips & Co., box 220, Black Hawk, Gilpin county, Colorado Territory.

M. W. Manville, London, Canada, desires to obtain Paper-Bag Machines.

Parties wishing to purchase a good steam engine please address W. Burlingame, Exeter, N. H.

Persons wishing to buy small Patented articles of utility will please address, with stamp, Lechner & Stump, Sheridan, Pa. Samples 50c.

Manufacturers of Sulphuric Acid and Sulphur from Pyrites, etc., please address Abraham Reeder, Newburgh, Cumberland county, Pa.

Cotton-seed Hulling Machine Wanted. Address W. M., box 4658, New York City.

New Orleans Agency to sell Patents, etc. See Advertisement.

For Sale—Foulds' Automatic Hinge for Window Shutters.—This is the most convenient window-shutter hinge ever invented. There being no danger of breaking hinges and dropping shutters, as is very often the case now. The entire right for sale low, or will sell the Eastern and New England States. Address Cherry & Eckman, Cleveland, Ohio.

New invention. A potato digger which puts the potatoes in a bag and the small ones apart in a box. The original was made by a blacksmith at very little cost, which will be saved by the work on three acres of potatoes. Patent rights to sell: C. G. Grabo. Address care of Schober Bro., Detroit, Mich.

NEW PUBLICATIONS.

COLORADO IN THE UNITED STATES OF AMERICA. Schedule of Ores Contributed to the Paris Exposition. By J. P. Whitney, of Boston, Mass. London, E. C.: Cassell, Pelter, & Galpin.

The first gold medal of the Exposition was awarded to the Colorado ores. To Mr. Whitney the mineralogists of the world are indebted for a description of these specimens and for a chapter of useful information about Colorado and its resources. The handsome pamphlet containing this information is illustrated by two excellent maps, one of the United States and Territories, and one of Colorado, the latter one of the best that we have yet seen.

THE IRON MANUFACTURE OF GREAT BRITAIN, Theoretically and Practically Considered by W. Truran, C.E. Second edition, revised by J. A. Phillips and W. H. Dorman, C.E. New York: D. Appleton & Co.

This work is without doubt one of the best practical treatises on this subject in this or any other language. It is written by an iron metallurgist of great experience and practical skill of a high order. Of course, those familiar with the manufacture of iron are aware that Mr. Truran's views with respect to the use of hotblast are not regarded by iron managers as orthodox; in fact, according to the interpretation his critics put upon his views in this particular, the experience with furnaces during the past six or seven years does not appear to corroborate his conclusions. We are free to say, however, that in our opinion Mr. Truran, on this head, has been greatly misrepresented, and we have heard more than one furnace manager assail his views, without in reality knowing what they were. Dr. Percy, the author of a late work on the metallurgy of steel and iron, assailed him in a very acrimonious and undignified manner. Dr. Percy's dissent from Mr. Truran would have carried more weight if it had been otherwise expressed.

THE MORTALITY OF NATIONS: An Address Delivered before the American Equal Rights Association, in New York, May 9, 1867, by Parker Pillsbury.

Whatever opinion may be entertained of Mr. Pillsbury as a reformer, it cannot be denied that he is a close and logical reasoner. This address bears the marks of scholarship and philosophical thought. It advocates the legal equality of the sexes, including the right of suffrage, a measure which is favored by some of the foremost thinkers of the age, by such men as John Stuart Mill and others of the progressives.

THE MECHANICIAN AND CONSTRUCTOR, Part VIII. By Cameron Knight. London: E. & F. Spon.

We have before directed attention to this serial as a work of the greatest practical value to the machinist, engineer, and general iron worker. Its illustrations are as valuable as the best mechanical drawings, and they and the text descend to the minutest details. It can be obtained by subscription of John Wiley & Son, 535 Broadway, New York City.

THE FOULING AND CORROSION OF IRON SHIPS: Their Causes and means of Prevention, with the mode of application to the existing Iron-Clads. By Charles F. T. Young, C.E., etc., author of "The Economy of Steam Power on Common Roads," "The Best Mode of Protecting London from the Ravages of Fire," "Fires, Fire Engines, and Fire Brigades," etc. With illustrations. London: The London Drawing Association, 7 Duke st., Adelphi, W. C. pp. 212.

In addition to the subjects indicated in the title page, this book discusses the relative merits of wood and iron for ship building, and concludes unreservedly in favor of the latter. The book is throughout made entertaining by appropriate historical illustrations. The arguments are distinctly and earnestly set forth, and the author everywhere shows himself to be master of his subject. The publication is timely, and we have no doubt that it will have a profound and lasting influence on the art of ship building.

A TREATISE ON ASTRONOMY, Spherical and Physical, with Astronomical Problems, and Solar, Lunar, and other Astronomical Tables. For the use of Colleges and Scientific Schools. By Wm. A. Norton, M. A., Professor of Civil Engineering in Yale College. Fourth edition, revised, remodeled, and enlarged. New York: John Wiley & Son, 535 Broadway. pp. 557.

Norton's Astronomy has for a long time been a favorite text book, and in its greatly improved form has no rival. The work comprises an account of the most recent discoveries and of the most plausible theories. We shall make use of the work as the most reliable authority on the subjects of which it treats. The publishers are deserving of praise for their part of the labor—the elegant illustrations and the handsome typography.

A TREATISE ON THE SCREW PROPELLER, etc., by John Bourne, C. E. Part XXIII. London: Longmans, Green, Reader, & Dyer.

This treatise, when completed, will be undoubtedly an authority among marine engineers. The plates are superb and give illustrations of some of the finest engines ever constructed, while the accuracy of the text is assured by the name of the eminent author. Van Nostrand receives subscriptions for this and other foreign, scientific, and mechanical publications.

EXTENSION NOTICES.

Erastus T. Bussell, of Indianapolis, Ind., having petitioned for the extension of a patent granted to him the 29th day of November, 1853, for an improvement in combined india rubber and steel springs, for seven years from the expiration of said patent, which takes place on the 29th day of November, 1867, it is ordered that the said petition be heard at the Patent Office on Monday, the 11th day of November next.

James Watt, of Charlestown, Mass., having petitioned for the extension of a patent granted to him the 6th day of December, 1853, for an improvement in valve arrangement for steam hammers, for seven years from the expiration of said patent, which takes place on the 6th day of December, 1867, it is ordered that the said petition be heard at the Patent Office on Monday, the 18th day of November next.

Melvin Jinks, of Danville, N. Y., having petitioned for the extension of a patent granted to him the 13th day of December, 1853, for an improvement in turnkeys, for seven years from the expiration of said patent, which takes place on the 13th day of December, 1867, it is ordered that the said petition be heard at the Patent Office on Monday, the 25th day of November next.

William Wisdom, of Brooklyn, N. Y., having petitioned for the extension of a patent granted to him the 20th day of December, 1853, for an improvement in cleansing hair and feathers from insects, etc., for seven years from the expiration of said patent, which takes place on the 20th day of December, 1867, it is ordered that the said petition be heard at the Patent Office on Monday, the 2d day of December next.

Lucian B. Flanders, of Philadelphia, Pa., having petitioned for the extension of a patent granted to him the 6th day of December, 1853, for an improvement in replacing cars upon railroad tracks, for seven years from the expiration of said patent, which takes place on the 6th day of December, 1867, it is ordered that the said petition be heard at the Patent Office on Monday, the 18th day of November next.

Joseph Nock, of Philadelphia, Pa., having petitioned for the extension of a patent granted to him the 3d day of December, 1853, for an improvement in hinge for inkstand covers, for seven years from the expiration of said patent, which takes place on the 13th day of December, 1867, it is ordered that the said petition be heard at the Patent Office on Monday, the 25th day of November next.