

Notes & Queries.

[We present herewith a series of inquiries embracing a variety of topics of greater or less general interest. The questions are simple, it is true, but we prefer to elicit practical answers from our readers.]

- 1.—ENCKE'S COMET.—Will some of your readers inform me which constellation Encke's comet is in?—W. E.
- 2.—GEARING FOR SAWS.—Is it practicable to run a circular saw, of 48 inches or more diameter, with a bevel gear instead of a belt?—A. K.
- 3.—WATERPROOFING COTTON CLOTH.—I am making a tent of cotton cloth; is there any way in which I can make it waterproof?—H. W. U.
- 4.—FACE WORMS.—Can any of your correspondents give me a remedy for the grubs or face worms, so common about the nose?—H. E. A.
- 5.—EMERY BELTS.—We wish information as to the manner of making and using emery belts, on which to polish the prongs of filing irons or tongs.—S. & B.
- 6.—FIELD GLASS.—Is there any difference in the construction of a day and a night field glass? If not, how can I determine the night adjustment?—F. H.
- 7.—SHELLAC AND LINSEED OIL.—Can I mix shellac varnish with linseed oil, and form a preparation that will give some luster when applied to bare wood?—W. W.
- 8.—CEMENT FOR SHEET IRON AND RUBBER PACKING.—Can any of your readers inform me how to make a cement that will unite firmly Russian sheet iron and thin rubber packing, and remain unaffected by changes of weather?—J. M.
- 9.—VARNISHING PITCH PINE.—I am informed that some process has been discovered, by which varnish can be applied to pitch pine, so as to prevent the wood from turning dark and becoming dingy in appearance. Can any of your readers tell me how it is done?—J. H.
- 10.—COATING IRON WITH QUICKSILVER.—Can iron weights be coated with quicksilver, by using hydrochloric acid to effect the union? Will some one refer me to some work whence I can get a sufficiently clear account of the process to enable me to repeat it, or state the process for the public benefit?—T. H.'s S.
- 11.—DIMENSIONS OF BOILER GRATE.—I have a marine boiler, 7 feet in diameter, 12 feet long, with grate surface 3 x 7 feet inside the boiler, which is cylindrical. The draft returns between two inch tubes. I would like to know if the grate surface is sufficient to burn shavings and cuttings.—B.
- 12.—STEAM BOILERS.—Mr. G. H. Gregory, of Toronto, Canada, in commenting on a letter from Mr. Nicholson, published on page 5 of our current volume, asks how it was that the motion of the steamer, in a sea so rough as that described, did not throw the water into contact with the upper row of tubes, which were red hot, and so cause an explosion.
- 13.—PROPORTIONS OF SAW MILL GEARING.—Supposing the pitman and saw of a Muley saw mill to weigh 200 pounds, and be attached to a crank wrist of 26 inch stroke, and running at a speed of 350 revolutions per minute, how much counterbalance will be required, or, in other words, what proportion of the weight of saw and pitman is necessary as a counterbalance, to make the crank wheel run with the least vibration?—T. B.
- 14.—FRICTIONAL ELECTRICITY.—I have a battery of this kind—turning with a crank, and designed for medical treatment—that I cannot get to work; and I desire to get, from some of your many readers, a possible remedy. It turns freely; the mechanism is all correct. The permanent magnet is strong, and I can observe no derangement of the revolving magnet. I have examined all points of contact, insulation, etc., and have tried it with close contact and none at all, without success. What shall I do?—M. H. K.
- 15.—COMPOUND SCREW GEARING.—You have given an answer, furnished by J. P. N., of New York, to my query in regard to compound gearing; but unfortunately, I am no better off than before, as the rule given by J. P. N. will only apply to simple gearing, as I understand it. In speaking of compound gearing, I refer to those lathes on which the wheels, intermediate between spindle and screw, must be compounded. What I want is a quick method of finding the wheels without making elaborate calculations. As J. P. N.'s rule will only find the spindle and screw wheels, I take it for granted that he did not understand my query. Will he please try again?—R. F. S.
- 16.—APPLICATION OF LIGHT ENGINES TO SAW MILLS.—Since the war, steam threshers are being introduced into this part of the State; but, as most of the threshing is done early in the fall, many of them are idle during the winter. Some attempts have been made to use them for driving saw mills during the winter season, but none that I know of have been successful. Now, in theory it would appear that a ten horse power would saw half as much as a twenty horse power. Thus far, however, we have not been able to do that much with ours; so what we want to know is how to apply such power to get satisfactory results. Timber is scarce, but we frequently have large trees, requiring at least a fifty inch saw; so, to make the proportions more definite, we want to know how to apply a ten horse power engine to a fifty or fifty-six inch saw so as to give the best results.—NEMO.

Answers to Correspondents.

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

ALL reference to back numbers must be by volume and page.

- J. J. W., of —.—White cedar, placed in the ground for fence posts, is very durable. We know some that has lasted more than sixty years.
- M. M., of Mo.—We see no advantage in constructing boilers as you propose.
- E. M. W.—You will find the subject of ice formation discussed at length in the SCIENTIFIC AMERICAN, Vol. XXII. We do not wish to reopen the discussion at present.
- OIL IN WINTER.—To J. S., query 7, Jan. 1: By mixing kerosene oil with seal or sweet oil in a warm state, it will be prevented from getting stiff in cold weather. The right proportions will be found upon trial.—W. H. R., of N. J.
- ETCHING ON GLASS.—F. H. can etch on his glass vessels as follows: Coat the object to be etched with a thin film of wax; then, with a sharp instrument, draw the desired characters carefully, cleaning the wax off in the figures; go to some chemist and get some fluorine acid, which must be handled very carefully. The acid comes prepared in metal bottles. Pour some of the acid in a small lead pan, which place in a still larger vessel filled with sand; heat the sand and place the glass object over the gas liberated from the heated acid, and it will soon be found to be beautifully etched. Great care must be taken when this is going on, for the gas, as well as the acid, is of a very deleterious character.—E. X., of Mass.

M. H. B., of Ill.—In order to trim a flat boat, would the excess of weight upon the heavy side be precisely double the amount necessary to carry to the light side? Ans. Yes.

FRICTIONAL ELECTRICITY.—This can and has been used for telegraphing. It is not as good as chemical electricity for the voltaic arch.—E. X., of Mass.

PREPARATION OF COTTON SEED OIL.—Query No. 23, Jan. 6. Treat the oil with ozone or ozonized air; either will accomplish the desired result.—C. F. D., of N. Y.

CLEANING PAINT BRUSHES.—J. G. M. should try soaking them in hot rancid grease.—W. H. R., of N. J.

CLEANING CASTINGS.—Query No. 15, Jan. 1. I advise L. V. B. to try the sand blast for cleaning his brass castings.—W. H. R., of N. J.

ROTARY MOTION.—W. T. V., query 13, Jan. 1, 1872, can impart rotary motion, of any desired speed, to the vertical shaft described, by a suitable train of gearing, actuated by a barrel spring.—J. M., of N. Y.

BACK PRESSURE.—To R. R.: The back pressure upon piston will not be materially increased, provided you leave the end of five inch pipe open. Do not use any back pressure valve. The pipe must be laid so that it will not "trap." You should use long round bends instead of elbows.—J. M., of N. Y.

GUN SCATTERING SHOT.—H. W., query No. 3, Jan. 1, can prevent his gun from scattering by inserting a ring about half an inch in width in the nozzle of the gun, beveling from the outer edge to nothing at the inward. It can be fastened in with rivets; it should be made of metal about one sixteenth of an inch in thickness, and be fitted very neatly.—W. H. R., of N. J.

BRONZE PAINT.—This can be made by mixing chrome green, two pounds, ivory black, one ounce, chrome yellow, one ounce, good Japan varnish, one gill. Grind all together and mix with linseed oil.—E. W., of Mass.

GUN SCATTERING SHOT.—If H. W. will inclose his shot in strong, round paper cartridges, just fitting the band, his charge will not scatter very much. Cartridges may be formed over a round wooden stick, and glued with mucilage or any suitable cement.—H. E. A., of Conn.

BRONZING IRON.—To bronze iron, J. G. H. should obtain, at any paint store, a bottle of gold size and some bronze powder: mix the articles in a saucer to the proper consistency and apply immediately, as it soon dries hard. Any sort of brush can be used.—H. E. A., of Conn.

FUSING SULPHUR.—F. C. A. can fuse his sulphur by a heat of 226° Fah. If the heat is carried above 450° Fah., the sulphur becomes dark colored and thick, like molasses. F. C. A. would do well to consult some book on chemistry.—H. E. A., of Conn.

CEMENT FOR LEATHER AND IRON.—E. A., query No. 4, in No. 1, present volume, can make a very good cement for leather and iron by making a compound of glue dissolved in vinegar, heated over a moderate fire; then strain one third its weight of white pine pitch. This should be done in a glue pot, where it should be kept and heated whenever wanted for use.—J. L. T., of O.

GUN SCATTERING SHOT.—E. A., January 1st, asks how his gun can be made to shoot closer. It can only be done by having the gun rebored, so that the bore shall taper towards the muzzle. There is, however, an article on this subject on the 39th page of Vol. XXIII, SCIENTIFIC AMERICAN. The Roper gun, made in Hartford, Conn., has a close shooting attachment, which consists of a ring of steel gradually tapering towards the muzzle (of the cap) which is screwed on at the will of the sportsman.—E. X., of Mass.

COMPOUND GEARS IN SCREW CUTTING.—If R. H. S. will follow my example, he will find it both simple and reliable. Let him make a fraction of his leading screw and screw to be cut, with his leading screw for numerator. Now let him split these into factors, and by adding a cipher to each, he will have the gears required; but the numerators are always the driving gears. Suppose he wants to cut twenty-four threads per inch. Example 1: Four twenty-fourths is equal to (2 divided by 6) multiplied by (2 divided by 4). Now by adding a cipher to each, the gears will be (20 divided by 60) multiplied by (20 divided by 40). If he has not two twenties, let him increase one numerator and one denominator, say one fourth, which would be (25 divided by 75) multiplied by (20 divided by 40); if he still has not got these gears, let him alter them again until he finds a right set of gears. Now I will give him another method from the same factors. Example 2: Four twenty-fourths is equal to (2 divided by 3) multiplied by (2 divided by 4). By multiplying the first fraction by 12 and the other by 15, he will have: (24 divided by 36) multiplied by (30 divided by 120); or he can multiply by any numbers to suit his gears. If this is simple and reliable enough for R. F. S., I hope he will acknowledge it, as I have been solicited to write a book on screw cutting.—C. F., of N. J.

TIGHTENING OF BELTS.—I notice in Vol. XXV., No. 21, that G. W. F. wants to know whether belts are tighter in wet or dry weather. In Vol. XXV., No. 26, E. O. McC., of S. C., says belts slacken in wet weather, and thinks that what he saw of a few (probably) new belts is a proof of the truth of his statement. Now I fully agree with E. O. McC. in answering the query, but I judge from a much broader observation than E. O. McC. or S. F. F. (Vol. XXVI., No. 1.) I have worked around leather belting for a number of years, and for the last three years have had belts of the following dimensions under my care: one 142 feet long by 36 inches wide; one 178 feet 6 inches long by 34 inches wide; one 85 feet 6 inches long by 34 inches wide. These belts are all double and made of the best of leather, all running from one fly wheel 30 feet in diameter to 6 and 7 feet driven pulleys. Now I know that on a damp day these belts sag from 6 inches to 18 inches more than they do on a pleasant day. I hear some correspondents say: Your machinery drives harder. Well, I will tell such that we were stopped eight weeks on a spinner's strike in the summer of 1870, and that, during all that time, the belt, halfway between the pulleys, would indicate the state of the atmosphere as well as a barometer.—J. D. C., of Mass.

Declined.

Communications upon the following subjects have been received and examined by the Editor, but their publication is respectfully declined:

- CEMENTS.**—M. M.
- FIRE KINDLER.**—D. W.
- FLYING MACHINE.**—W. F. W.
- GAS.**—J. S. P.
- GEOMETRICAL PROBLEM.**—W. P. M.
- LATENT HEAT.**—F. of T.
- MASSACHUSETTS INSTITUTE OF TECHNOLOGY.**—W. O. C.
- MECHANICAL MOVEMENT.**—E. N.
- NEW STEAMBOAT ACT.**—T. W. B.
- PSYCHIC FORCE.**—J. C. B.—P. P. H.—J. A. S.
- RUPTURE OF BOILERS.**—T. W. B.
- STRAINS ON TRUSSES.**—J. McR.
- TO SMOKE OR NOT TO SMOKE.**—E. E. S.
- ANSWERS TO CORRESPONDENTS.**—L. E. C.—R. R. R.—C. S.—G. W.—P. L. S.—E. B. R.—O. C. W.—W. J. B.—W. O. B.—C. D. S.—W. Q. & Co.
- QUERIES.**—W. E. H.—W. J. P.—T. B.—C. G.—M. L. D.—W. E.—G. A. L.

Recent American and Foreign Patents.

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

SHOE FASTENING.—Samuel P. R. Triscott and George Alfred Wheeler, Worcester, Mass.—This invention has for its object to furnish an improved device for fastening the ends of boot and shoe laces, which shall hold the laces or strings firmly and securely. The device can be readily struck up out of sheet metal, in two pieces, so that it can be very easily and cheaply made, and, at the same time, can be ornamented in any desired style or manner.

SAW FILER'S VISE.—Nathan H. Baldwin, Laconia, N. H.—This invention has for its object to furnish an improved vise for saw filer's use, holding the saw firmly, and enabling it to be adjusted in any required position. The foot of the vise rests upon the bench or support, to which it is secured by a hand bolt. The standard of the vise has its lower end jointed and secured to the upper end of the foot by means of a bolt and hand nut. To the upper end of the standard is pivoted the middle part of the rear jaw of the vise. Upon the lower edge of the middle part of the rear jaw is formed a half circle, having a slot formed in it upon the arc of a circle having its center at the pivoting point of the said jaw. A cross head bolt passes through the slot of the half circle, through a hole in the upper end of the standard, and has a hand nut screwed upon it, so that by turning the head of the bolt across the slot in the half circle, and tightening up the nut, the jaws may be securely held in place when adjusted. By a simple adjustment, the jaws may be reversed for holding the saw to joint the teeth.

CIRCULAR SAW MILL.—Melancton W. Danks, Fulton, N. Y., assignor to himself and J. E. Harroun, of same place.—The object of this invention is to provide convenient and efficient means for feeding, gigning back, and changing or varying the feed to circular saws, so as to adapt the feed to light or heavy work; and it consists in a series of bevel friction wheels, so arranged that, while the feed motion and the gigning motion of the carriage is produced by means of said bevel friction wheels, the feed may be varied at the will of the attendant, as may be desired or necessary. The inventor does not confine himself to any particular number of bevel friction wheels, nor to any particular diameter or proportion for either the sliding wheels or those on the feed shafts. Neither does he confine himself strictly to saw mill feed work in the application of his bevel friction wheels, as they may, he claims, be applied with great advantage to many other purposes.

ADJUSTABLE CUT-OFF VALVE.—George W. Smith, New Haven, Conn.—The valves oscillate in shafts. A combination of adjustable packing with grooved flanges of the ends of the valves, and with the slides, is employed. A combination, of a walking beam provided with spring catches at its ends three armed plates, ropes or chains, and springs, with each other and with the valve shafts and driving shaft, is another of the claims. A combination of pins, spring, bent levers, and connecting rod, with spring toes, walking beam, and governor, constitute the third claim. We judge that the invention is calculated to give a very sensitive and efficient variable cut-off.

HAIR SWITCH.—Benjamin Franklin Burgess, Jr., Boston, Mass.—This switch is made so as to be divided into three strands for braiding, composed partly of human hair and partly of thread or silk, or other suitable material. This thread portion is surrounded by the human hair, or forms the central portion of the switch, the arrangement being such that the human hair alone shows, and, being such, the natural hair of the wearer can be perfectly matched, which cannot be done with any dyed material. A switch, made according to this invention, will not get rusty like other artificial switches. It can be combed and braided the same as human hair, and, being composed of human hair and fine thread, keeps perfectly clean, and is entirely unobjectionable for ladies' wear.

HARVESTER.—John B. Thomson, Lynchburg, Tenn.—This machine is to be used either as a reaper or mower, and is so constructed as to rake the grain and drop it automatically upon the ground, in such a way as to place it out of the way of the machine on its next passage. As usual in this class of machines, the details are such as require diagrams for their illustration. We can only add, therefore, that the means employed for making the change from mower to reaper, and vice versa, are simple and easily adjusted, while the whole seems to be a substantial structure, capable of doing its work with small waste of power, and with little wear and tear.

PRUNING KNIFE.—David Morris, Bartlett, Ohio.—In this invention, pruning is accomplished by a knife that slides toward and away from a stationary hook, said knife moving in guides, and being moved by a rod that runs through the tubular handle of the instrument. The extremity of said handle bears levers with cogged segmental heads, which engage with the serrations on the head of the rod, and enable it to be reciprocated, by working the levers, so as to move the sliding knife.

SMUT MACHINE.—John Wernwag, Harper's Ferry, W. Va.—This invention relates to an apparatus which receives grain as it comes from the threshing machine in a hopper whence it is carried through a conveyor trough, wherein it is secured and wherefrom it is discharged into a revolving conical screen, within which it is beaten and separated from refuse grain and from which it is emptied into a fan by whose blast it is winnowed, the dust passing off through a trunk, the good grain falling through a spout, and the refuse grain being charged by a conveyor.

CAR COUPLINGS.—Franklin Nalley, of Battle Ground, Ind.—This invention has for its object to furnish an improved car coupling, so constructed as to couple the cars automatically when they are run together. By this construction, as the coupling link enters the bumper head, it pushes a catch back, which releases the coupling pin and allows it to drop into place, securing the link. By inserting the double coupling link in the upper and middle holes, in the middle and lower holes, or in the lower hole and beneath the bottom of the bumper heads, cars of different heights may be coupled with the same facility as if they were all of the same height.

SPRING BIT FOR CLEANING AND ENLARGING WELLS.—James H. Boyd, of West Monterey, Pa.—The object of this invention is to produce a convenient tool for cleaning out or enlarging oil wells. The invention consists in the application, to the shank of the bit, of a spring for crowding it against the well, and of a catch for holding the spring close to the bit during its application to the well. When the tool is to be applied to a well, the spring is held close to the shank by the spring catch, so that the insertion of the tool will be facilitated. The projecting outer end of the catch at the same time holds the bit clear from the wall of the well, preventing it from scraping while being let down. As soon as the device is being worked, when in its proper place the catch will release the spring, causing the same to crowd the bit against the wall of the well. For enlarging a well, the bit is used with a long spring. In this case the spring will enter the smaller part of the well and cause the bit to work in the larger part of the same upon the shoulder. For cleaning out wells the short spring is used, which crowds the bit against the wall of the well for properly scraping the same.

HEAD REST FOR CAR SEAT.—John C. Giffing, of New York city.—The head rest is attached to a base block, which rests upon the top of the seat when the head rest is attached. The head rest is secured in this position by two metallic straps. The ends of the base block are sawed in a distance equal or about equal to the width of the straps. The straps are bent to form square cornered staples. The front leg of the staple shaped strap extends down on the front side of the back of the seat. The back leg extends down on the back side of the seat, and may be shorter than the other leg. The width of the block is designed to be about equal to the thickness of the back of the seat, so that the legs of the two straps will straddle the back of the seat. In fastening the head rest to the back of the seat, the parts of the strap are slipped into the slots in the ends of the block, where they are fastened by pins. In leaning back or resting against the back of the seat, the person's back will bear against the front legs of the straps, which will keep the head rest in its proper position when the head bears upon the cushion. When not in use the head rest is folded up, in which condition it may be carried in a satchel or overcoat pocket without inconvenience.

CLOTHES WRINGER.—John Fox, of Farmersville, Iowa.—This is an improved clothes wringer, which, adjusting itself to the varying thickness of the articles passing through it, and being easily adjusted to operate upon larger or smaller articles, as may be desired, forms a very convenient and useful utensil.

Practical Hints to Inventors.

MUNN & CO., Publishers of the SCIENTIFIC AMERICAN have devoted the past twenty-five years to the procuring of Letters Patent in this and foreign countries. More than 50,000 inventors have availed themselves of their services in procuring patents, and many millions of dollars have accrued to the patentees, whose specifications and claims they have prepared. No discrimination against foreigners; subjects of all countries obtain patents on the same terms as citizens.

How Can I Obtain a Patent?

The closing inquiry in nearly every letter, describing some invention which comes to this office. A positive answer can only be had by presenting a complete application for a patent to the Commissioner of Patents. An application consists of a Model, Drawings, Petition, Oath, and full Specification. Various official rules and formalities must also be observed. The efforts of the inventor to do all this business himself are generally without success. After great perplexity and delay, he is usually glad to seek the aid of persons experienced in patent business, and have all the work done over again. The best plan is to solicit proper advice at the beginning. If the parties consulted are honorable men, the inventor may safely confide his ideas to them; they will advise whether the improvement is probably patentable, and will give him all the directions needful to protect his rights.

How Can I Best Secure My Invention?

This is an inquiry which one inventor naturally asks another, who has had some experience in obtaining patents. His answer generally is as follows, and correct: Construct a neat model, not over a foot in any dimension—smaller if possible—and send by express, prepaid, addressed to MUNN & Co., 37 Park Row, New York, together with a description of its operation and merits. On receipt thereof, they will examine the invention carefully, and advise you as to its patentability, free of charge. Or, if you have not time, or the means at hand, to construct a model, make a good pen and ink sketch of the improvement as possible, and send by mail. An answer as to the prospect of a patent will be received, usually, by return of mail. It is sometimes best to have a search made at the Patent Office; such a measure often saves the cost of an application for a patent.

Preliminary Examination.

In order to have such search, make out a written description of the invention, in your own words, and a pencil, or pen and ink, sketch. Send these with the fee of \$5, by mail, addressed to MUNN & Co., 37 Park Row, and in due time you will receive an acknowledgment thereof, followed by a written report in regard to the patentability of your improvement. This special search is made with great care, among the models and patents at Washington, to ascertain whether the improvement presented is patentable.

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To Make an Application for a Patent.

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MINERS' SQUIB.—John Holmes, of St. Clair, Pa.—This invention relates to an improvement in squibs for the use of miners in the process of blasting coal, rock, etc. The paper is cut in a peculiar form, one end is saturated with a solution of saltpeter and dried, and then the beveled side is covered with muelage or paste, so that when the paper is rolled into a tube the edge will adhere. The paper is rolled around a tapering piece of iron or other material of suitable size and form, and the tubels filled with powder. The match, properly prepared, may be rolled in the end of the tube, or attached to the end of the tube in any other suitable manner. The powder is prevented from escaping from the end of the tube by means of a stopper of soap or other suitable material in the end. The squib may be dipped in liquid sulphur to render it more inflammable, if desired. It is used for the purpose of throwing fire through the small opening left in a cartridge by the withdrawal of the tapering piece of iron or the needle, after the cartridge has been tamped in the hole which has been drilled in the coal or rock, or through a tube called a "blasting barrel," that is generally put into the hole with the cartridge and left in when the blast is discharged. Squibs of some kind are used, by all miners, ordinarily made upon the spot and consequently very imperfectly prepared, and with material unsuited to the purpose. The object of this invention is to furnish these squibs as perfect as they can be made of the most suitable materials, and have them ready for use in mining and other districts.

CLOTH SHEARING MACHINE.—Michael Craven, of Dedham, Mass.—This invention refers to a new shear rest for shearing cloth, such as plain and fancy cassimeres, satinetts, shawls, etc. Its object is to prevent the forming of flocks on the back of the goods while being sheared. A roller as long as the brush of the machine is used, which hangs in arms that project from a rod, whose ends are journals by which the roller frame is pivoted to the frame of the machine. The roller is carried up clear of the brush. The cloth is drawn over the roller with its face side to the brush, which will raise the nap so that the shear blades may cut it off. The cloth passes between the roller and brush, both being close enough together to raise a sufficient nap, which loosens the flock felted into the cloth. In ordinary shearing machines, these flocks collect into lumps and accumulate on the back of the cloth, so that the shears will cut holes where such lumps appear. The roller in this machine will keep the lumps back and off the cutters, besides creating less friction than the ordinary flat, sharp edged rest now in use.

BRUSH.—George Pirrung and Felix Pirrung, of Chicago, Ill.—This invention relates to that class of brushes where the bristles or other material are confined to a rectangular head by means of a groove or grooves therein, as clothes, shoe, whitewash brushes, etc. The head of the brush is grooved, and the bristles are doubled at the middle and confined in the groove by a piece of wood, metal, or other material, by means of screws, nails, or in any substantial manner. At the ends of the brush, the bristles are secured by metallic clasps attached to the head by nails or screws. The clusters of bristles forming the ends of the brush are likewise secured by wires fastened to the nails. The bristles for the sides of the brush may be put into the groove in clusters or sections, the bristles of each cluster being secured together by wires. The wires may connect the end clusters with the side clusters. The head is provided with holes to receive the bent handle.

BALE TIE.—Floyd G. Brown, of Brenham, Tex.—This invention is a new buckle or tie for holding the ends of the bands of cotton bales. It is formed with two arms or ends, both of which are doubled, forming thereby a hole in the tie for receiving one end of the band. The object of the invention is chiefly to prevent the loss of the buckle from the band while the latter is loose, and also to facilitate the fastening of the band to the bale. It is made of sheet metal of rectangular form, with two nearly square apertures near the ends and with a transverse slot in the middle. The buckle is formed from this plate by doubling the same in line with the slot. One end of the band, after being bent, is fitted through the aperture in the buckle so as to be held between the bars. The band is then laid around the bale to be bound and all the slack of the band is secured, when the operator makes fast the outer end of the band by doubling all the surplus of the same, so that it also can be hooked over the bars. This tie, it is claimed, will be absolutely secure, and will prevent the spontaneous working loose of the band under all circumstances, except breakage.

IRON COLUMN.—William A. Gunn, of Lexington, Ky.—This invention consists in an improved construction of metallic columns to give the strength of the double T beam in two directions, while the necessity for cutting and riveting is greatly lessened. Double T bars or beams of wrought iron or steel are used. Two of the bars or beams are placed with their sides against the edges of a third bar or beam, and are riveted to said bar or beam, the rivets passing through the flanges of the latter, and through the bodies of the first named bars or beams. The rivets should not be placed opposite each other in the different bars or beams, and may be further apart than in posts or columns constructed in the ordinary manner.

ANIMAL POKE.—Stephen C. Leonard, of Rushville, N. Y.—This is a new animal poke which is provided with a spring cushion concealing the prongs or pokes and with contrivances for adjusting the throat latch in suitable position and at suitable height to fit larger or smaller animals. The top of the bow may be cushioned by means of leather wound around or applied against it.

CAR COUPLING.—Frederick A. Illingworth, of Waltham, Mass.—This is an improved arrangement of coupling hook and shackle on a car coupling and has for its object to bring all the parts of a coupling under more perfect control, and, at the same time, insure greater reliability than can be found on the cars now in use. The invention consists first in providing the pivoted coupling hook with a prop or device whereby it can be held up clear of the link or shackle or let down at will. The invention also consists in the new arrangement of a pivoted connecting shackle, which has also a prop, whereby it can be held in a horizontal position ready for coupling. Furthermore, the invention consists in a general new arrangement of parts for the purpose specified, and by which ordinary coupling links can also be used for connecting cars having common drawheads with those provided with this improved coupling.

DOUBLE DERRICK.—Asa M. Tomb, of Owego, N. Y., assignor to himself and Charles M. Haywood, of same place.—This invention relates to a new machine for hoisting and lowering heavy weights and conveying the same from one place to another; and consists in a new arrangement of hoisting ropes, pulleys, and shafts. The frame of the derrick is on castor wheels, which support it on the ground and permit its convenient and speedy conveyance from one locality to another. A windlass is hung horizontally in bearings secured to the frame. The operating shaft is hung to the frame parallel to the windlass. A crank handle is affixed to the shaft, and a pinion on the same, the pinion meshing into a toothed wheel, which is mounted upon the windlass. The elevating ropes have one end attached to the windlass, and each is thence carried over a friction roller, and over a loose pulley, on a horizontal rod secured to the upper part of the frame. From this pulley the rope passes over a loose pulley, on a suspended shaft, and thence up again over another loose pulley, and back to a shaft to which its end is fastened. Thus, the two ropes being applied to the ends of the shaft, the shaft is held suspended. The windlass, when turned to wind up or unwind the ropes, causes this shaft to be raised or lowered. Two or more loose pulleys on this shaft serve to hold chains from which the weight is held suspended. The pulleys can be brought more or less far apart according to the length of the thing to be hoisted and conveyed. In stone quarries and yards, and also for building and other purposes, this derrick will be of considerable value.

MILLSTONE DRESS.—Edmund Deer, of Annapolis, Ind.—This invention relates to improvements in dressing burr millstones for grinding grain; and consists in feather edge zigzag furrows in the runner and in feather edge furrows in the bed stone, arranged in a peculiar manner. The bed stone has three feather edge endless concentric furrows. Short furrows extend from the endless furrows to the eye circle. There may be more or less in number of these short feathered furrows, and more than three endless furrows in the bed stone. In the runner a series of feather edge furrows radiate from the edge of the eye, and extend to the periphery of the stone. Between these furrows are intermediate furrows, commencing at the periphery of the stone, connecting with each other and with the radial furrows by means of short furrows, which latter are at nearly right angles with the intermediate furrows. The intersection of these short furrows with each of the longer furrows at the particular point where

the partially ground grain is driven around the endless furrow of the bed gives the short furrow ample opportunity to receive air and feed from the eye. The endless furrows in the bed diminish in size from the outer one inward. The advantages of the endless furrow are that, starting with the grain in the deep edge of the furrow, the grain is not driven directly up the slant of the furrow, but is driven round, gradually nearing the feather edge, and becoming more and more crushed and more nearly pulverized than it would be were it to pass directly across the furrow. Nothing remains at rest in these endless furrows, as the action of the air is too powerful to allow the partially crushed grain to remain at rest. The "land" of the skirt gives ample chance for the runner to act upon the unfinished flour, and there being no furrows in the skirt to receive the flour, it is thrown off by the runner fully ground. Furrowing of this description will, it is claimed, do more grinding, with less friction, and consequently with less power than the "drop" now in common use. Instead of making endless feather edge furrows in the bed stone, the furrow may be made in sections, or form a series of arcs of circles with their feather edges in the direction of the skirt of the stone. The inventor does not, therefore, confine himself strictly to endless or continuous furrows. The "land" in the bed stone may also be in sections so long as it forms, as a whole, a parallel with the skirt of the stone.

HEMMER FOR SEWING MACHINES.—S. B. Lawrence, of Scarsdale, N. Y.—This hemmer attachment consists of a presser having a slot and point, and a detachable scroll secured by a screw or its equivalent. It also consists in a notch formed in the slot of the presser to allow the adjustment of the point of the scroll.

PLOWS.—William H. H. Doty, of Sonora, Ohio.—This invention has for its object to furnish a plow, so constructed that it may be readily adjusted for use as a double shovel plow, a single shovel plow, or a covering plow. The handles may be readily adjusted higher and lower, according to the height of the plowman. The construction also enables the plow to be taken apart and packed in very small space for convenience of storage or transportation. A longitudinally adjustable frame, combined with a pair of handles pivoted thereto, and supported by adjustable braces, so that the handles and beams can be simultaneously and correspondingly adjusted, constitutes the claim of the patentee.

HOUSE BELLS.—Amos L. Swan, of Cherry Valley, N. Y.—This improvement in apparatus for ringing house bells consists in a double rocking cam and two slotted plates which connect the cam with the bell hammer, and in the general construction, arrangement, and combination of the parts and devices whereby, it is claimed, the apparatus is made much more positive in its action, ringing the bell whether the cord be pulled quick or slow.

BUNG INSERTER.—James Gillies, of Glasgow, Great Britain.—This invention consists in the construction of a device for inserting and removing screw threaded metallic bushes for the bung holes of casks and other like holes in other vessels. The tool is formed of a main round spindle, with a square head at top (for being turned by a powerful ordinary straight two armed wrench or lever, with the hole in the center, such as used for turning screw taps and wideners), having a toothed or serrated conical boss or segmental piece, mounted loosely and eccentrically on its lower end, where it is prevented from coming off by a screw nut. The spindle has a complementary segmental eccentric piece (of and opposite to the serrated eccentric piece) formed on it as a duplex cam, the two part cam fitting and filling the conical interior of the bush, so that when inserted in it the turning of the spindle in the eye of the eccentric of the boss by the wrench at the top, causes one or the other of the wings to act as an eccentric wedge or cam and press the teeth of the gripping boss into the inner service of the bush, the gripping action of the teeth increasing in proportion to the force required to turn or tighten and fix the bush, just also as the bush is getting further into the wood, which strengthens and sustains it for the necessary outward pressure of the cam tool, which can then get a stronger tap on the head to insure the non-slipping of the teeth within the bush. Both the spindle and gripping boss are preferred to be made of the best steel and tempered especially at the acting parts, so as thus to maintain or lengthen the time of the wearing efficiency of the tool.

BLINDSTOPS.—Perry A. Burgess, of Butler, Mo.—This invention is an improvement in the class of blind slat adjusters in which a bar is connected with the slats at one end thereof. The slats are provided with a pivot at each end near the rear edge, by which they are pivoted to the stiles, and they have another pivot at one end, near the inner edge, by which they are pivoted to the adjusting bar, which is fitted in a recess or rabbet in the inner edge of the stile extending from one cross piece to the other. The pivots are placed as near to the outer edge of the adjusting bar as they may be with safety, and the bottom of the recess is near the pins so that the slats may close completely. A spiral spring is connected to the upper end of the adjusting bar and to the top of the blind, and adjusted to pull the bar up and close the slats when let free. A groove is formed in the blind frame for this spring, and a grooved plate fastened therein for attaching the spring and preventing the latter from wearing the wood. It is grooved to let the spring and the adjusting bar flush with the surface of the blind. A grooved catch plate with a series of holes is let into the frame at the lower end, and a catch with a thumb bit is jointed to the lower end of the bar to engage with the said holes and hold the blinds more or less open, as required. A spring on the lower end of the catch bar bearing on the catch keeps it in connection with the catch plate.

BASE BURNING COOKING STOVE.—William Clark, of Shelburne, Vt.—This invention relates to a new cooking stove, which is provided with a circular fireplace and rotary interior lining thereto, and with a feed cylinder for the automatic supply of coal, and other new arrangements of parts, whereby it is claimed to be an important improvement on the cooking stoves now in use. The invention consists chiefly in the arrangement of the aforementioned rotary firebox, which can be set or turned at will to regulate the draft, and which contains a removable cross partition to have but half a supply of coal, which can be brought under either portion of the top plate or under the oven, as may be desired. The invention also consists in a new arrangement of draft-door, grate, oven, and water reservoir.

HOMINY MILLS.—Theodore Hudnut, of Terre Haute, Ind.—A long iron or steel shaft of suitable length and size is used for the purpose, and a wood shaft is fitted upon it, said shaft being as much shorter than the iron shaft as is necessary to have the latter project at each end to form the journals and receive the gearing for turning it. The wood shaft is secured by means of collars keyed to the iron shaft and bolted to the wood shaft, and it has four or more plain sides, according to the number of rows of cutters it is to carry, each side having a metal plate attached to it. These metal plates have lugs attached to them at intervals of the same distance apart it is required to have the cutters, the said lugs being arranged lengthwise transversely of the plates; and those of one row are placed a short distance laterally from those of the next rows either way, in such order that they form broken spiral rows around the shaft. The cutters consist of steel plates with the inner point of the cutting edges projecting over a true circle struck from the axis of the shaft, and are bolted to the arms between them. These arms are bolted to the lugs on the plates, being laid across said plates tangentially, so that they are confined against turning on the bolts by said plates. The collars are provided with broad plano-convex disks which keep the grain away from the bearings and in contact with the cutters. This arrangement of the arms or holders of the cutters permits of their being readily removed for repairing or removing the cutters.

LIQUID METER.—David W. Huntington and William A. Hempstead, of South Coventry, Conn.—The first part of this invention consists in an arrangement of valves and ports whereby, in a double cylinder meter, the piston of one cylinder actuates the valve for the other, and vice versa. The second part consists in an improved arrangement of valves for balancing them. The third part consists in a device for steadying the piston rods during the time of their greatest extension from the stuffing box of the cylinder; and the fourth part consists in the combination, with a water meter, of a mud and sand trap.

CLOVER HULLER AND CLEANER.—Thomas Church, Lewisburg, Pa.—This invention relates to a hulling cylinder constructed of cast iron staves attached to a wooden core, said staves having roughened exterior surfaces, and having also knobs or raised parts standing out from the periphery in circular rows, the case in which the cylinder works having a roughened interior surface with transverse grooves, in the same, which the raised parts of the cylinder traverse.