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Improvements in Cannon.

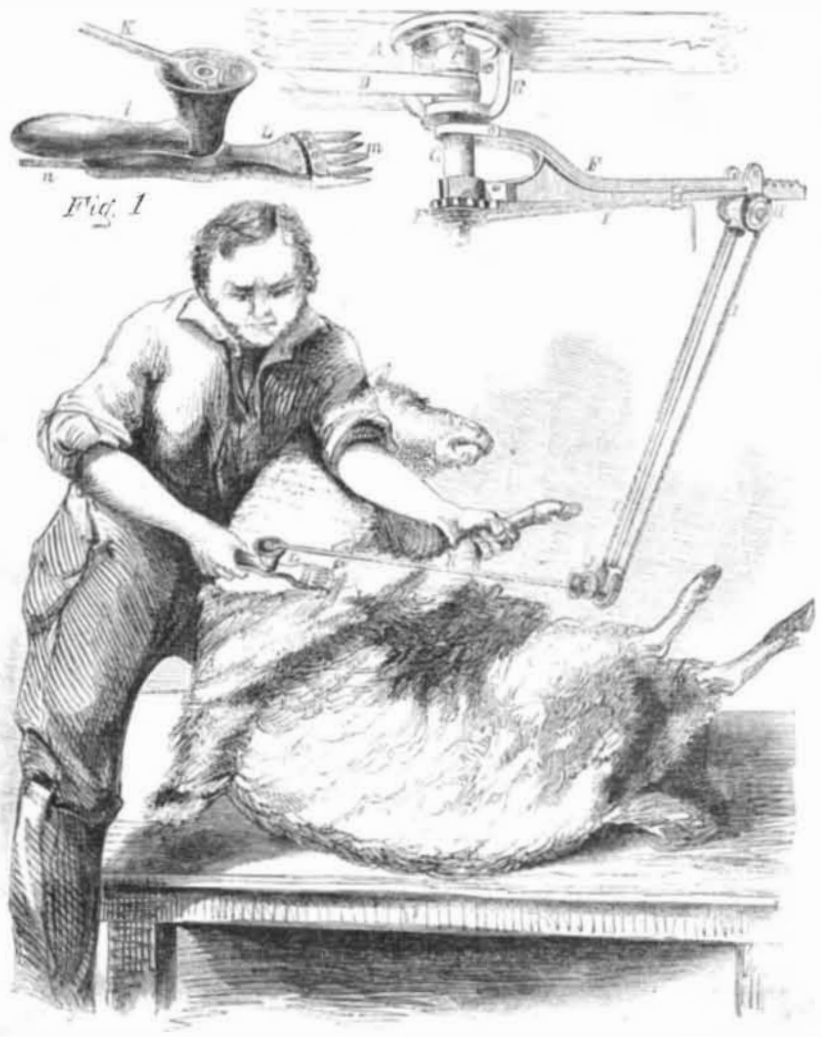
On this subject Captain Blakely, R. A., in an article published in the London *Artisan*, states that "a 32-pounder is the limit of cast iron guns of the present shape, any larger than that being unsafe with a full charge." In reference to cannons of large caliber, the shot can be carried to a greater distance, and do more execution than small balls, because the weight of the ball is greater in proportion than the surface of resistance to the air. Thus a 16-inch shot presents sixteen times the surface of resistance of a 4-inch shot, but it weighs sixty-four times as much. Large guns, however, require to be made stronger than small ones, large shot taking a longer period of time to acquire its velocity, therefore the pressure of the powder on the gun remains longer. The *time* that great pressure is exerted on any material is an important element, to which too little attention has been paid in submitting bodies or instruments to severe tests of strength. A body may bear a certain pressure for one second, which if continued for one minute would destroy it. This is doubtless the case with cast iron, of which material cannon are made.

Captain Blakely recommends that cannon of large caliber (say 10-inch) be formed of the same shape they are at present, but that the outside, at the breech, be strengthened with two layers of thin wrought iron cylinders put on at a bright red heat and hammered. One gun of this description made by him stood 447 rounds with double charge, and 158 rounds loaded to the muzzle. R. Armstrong, of Newcastle, England, has made a cannon of a solid steel center, with bar iron coiled round it and welded, which has stood thousands of rounds. Captain Blakely believes that, for very large cannon, a good plan of construction would be with a cast iron cylinder center, and either rod iron wound round it at a great heat and welded layer over layer, each in cooling taking a permanent strain, or else substitute strong iron wire wound round it at a high heat, each layer having a greater initial strain than the one under it. In this manner all the fiber is laid in one direction, and the outside takes its share of the strain. The subject of heavy ordnance is now exciting much attention among engineers of gunnery and others. The foregoing views, in our opinion, deserve general attention from all interested.

Alloy of Chromium.

In the *Comptes Rendus*, it is stated that M. Fremy has lately obtained an alloy of chromium and iron, by reducing chromate of iron with charcoal under a high heat in a crucible. The alloy, it is stated, resembles brass in appearance, and is very hard.

JENKINS' SHEEP SHEARER.



One of the oldest materials used in the manufacture of fabric is the wool and hair of animals; and although at first the wool would be taken from the dead animal, it was not long before the living one was robbed of its natural clothing to protect our more tender bodies from the atmosphere's changes. The scissors or shears used for this purpose were very primitive indeed, being only two blades and a spring back; and with this simple implement sheep have been sheared for thousands of years past; it is but lately that a new implement has been introduced which can be worked by power, thus leaving the operator all his strength to manage the sheep and guide the shears.

Our engraving (Fig. 2) represents a sheep being sheared by one of these machines, which is snspended from a beam, A, and consists of a frame, B, carrying a fast and loose pulley, C, turned by the belt, D, to which motion may be given by any convenient means. From the frame, B, a short shaft, G, descends, carrying the arm, F, which can be moved around upon it, and is free to be accommodated to the wants of the operator. From the end of F is suspended by a rack the pulleys and shaft, H, to which is attached the shaft, K, by an universal joint at J, carrying at its extremity the knife and handle, L. Motion is communicated from D by a spindle passing through G, having a pulley, E, at its extremity, which imparts motion to the cord, I, and thus by turning the shaft, K, through the pulley and universal joint, J, gives motion to the knives, *m*, in L, by the universal joint, *k*, as seen in Fig. 1, which is an enlarged view of the cutter, knife, or shears, L. *l* is the handle, and *m* the knives, which move against each other by means of the apparatus above described, and *n* is a stop for regulating the motion of the cutters. In the process of shearing, the sheep is usually laid upon a table, with its head under the operator's left arm, while with the right he governs and guides the shears. By the construction of this machine it will be seen that the shears can be guided to any inequalities of the sheep's body; and there is little doubt that it is a good and convenient labor-saving machine.

This is the invention of J. V. Jenkins, of Detroit, Mich., and was patented by him the 8th of September, 1857. All further information can be obtained by addressing as above.

Divisibility.

This is a property possessed by all bodies, and means their capability to be separated into parts.

It was formerly a question among philosophers whether matter was capable of being divided *ad infinitum*, or whether there was a limit beyond which matter could not be divided. The question is incapable of direct solution, and fortunately science does not require that it should be known; but the extent to which subdivision has been carried in the arts is prodigious. In the gilding of buttons, five grains of gold, which is applied as an amalgam with mercury, is allowed to a gross; so that the coating left must not be more than the 110,000th part of an inch in thickness. If a piece of ivory or white satin be immersed in a solution of nitro-muriate of gold, and exposed to a current of hydrogen gas, it will be covered with a surface of gold not exceeding the ten-millionth of an inch in thickness.

A single grain of blue vitriol will give an azure tint to five gallons of water. In this case the copper must be attenuated ten million times, and yet there is sufficient in each drop of water to give it color. Odors are capable of still further diffusion: a single grain of musk has been known to scent a room for twenty years.

Animal matter likewise exhibits many instances of wonderful subdivision. The milt of a codfish, when it begins to putrify, has been estimated to contain a billion of perfect insects, so that thousands of these little lives could be lifted on the point of a needle. One of the infusorial animalculæ found in duckweed is ten million times smaller than a hemp seed; and another, discovered in ditch water, appears in the field of a microscope a mere atom endowed with sentient life, and millions of them play, like sunbeams, in a single drop of liquid.

Soluble Glass Soap.

At a recent meeting in Berlin of the Association for Promoting Industrial Arts in Prussia, H. Wichgraf reported the results of a trial that had been made with the silicate of soda (soluble glass) as a substitute for soap in washing clothes at the prison of Spandau. At this place 5,936 articles of clothing are washed every week. The cost of soaking these with soap amounted to about $5 94, but with the silicate only $1 76. The linen is first steeped for twenty-four hours in a mixture of one pound of the silicate of soda to ten gallons of water, then it is washed with common soap suds rinsed in clean water and dried. The steeping of linen clothes in an alkaline or soap solution prior to washing in the usual manner, affords time for the grease and dirt in them to unite with the alkali or soap, they therefore require but little rubbing and labor afterwards. Clothes treated in this manner involve less labor in washing than by the old method, without steeping. A great number of persons in our country pursue this system; still it is not a universal practice.

Platinum.

This metal, which is rather heavier than gold, is of a greyish white color, and is capable of receiving a very fine polish. The tenacity of pure platinum is almost that of iron, and for all practicable purposes it may be regarded as infusible; like iron, it yields to the hammer, and can be welded at a white heat. None of the simple acids will attack it, and therefore it is used to make vessels for their manufacture, its only drawback being the great expense. It is dissolved by a mixture of nitric and muriatic acids. When in an extremely divided state, platinum has a peculiar property of absorbing great quantities of gas, and also of igniting and becoming red hot in a stream of hydrogen. Platinum was not known in Europe until the middle of the last century, although it was known long before on this continent, where it had received the Spanish name of *platina*, or *little silver*. It is found in Peru and Russia, which last country affords about one thousand pounds annually, and about six hundred pounds are given to the world every year by Borneo.

Ground Nuts.

These nuts are produced underground by various plants, chiefly shrubs and umbelliferous plants, while in China they come from the common vetch.

Issued from the United States Patent Office

FOR THE WEEK ENDING DECEMBER 22, 1857.

[Reported officially for the Scientific American.]

PREPARING FIBROUS SUBSTANCES FOR SPINNING—James Aperly and William Cliasold, of Dodridge, Eng. Patented in England December 4, 1856: We claim the means described for conducting the roping or sliver from one preparing machine to the other, and laying the roping or sliver in parallel lines on the feed bands, aprons or tables of preparing machines.

WASHING MACHINE—Henry L. Bridwell, of New Albany, Ind.: I claim the combination of the corrugated cylinder, A, with the single oscillating, self-adjusting knuckle, B, when arranged in the manner set forth and for the purpose described.

CLOCKS—Robert P. Cunningham, of Eastford, Conn.: I claim first, Looped or slotted spring pallets acting tensively from the faces of the swing wheel teeth, S.

Second, I claim the combination of the tensive pallets and swing wheel teeth, either with or without the stops, d d, or with the stops, i i', for the purposes shown in manner as set forth, or substantially their equivalents.

EXTENSION TABLES—Edwin A. Curley, of Westport, Conn.: I claim constructing the slides, C D, of sheet metal, corrugated and bent by any proper means, so as to form tubes provided with longitudinal dovetail tongues and grooves by which the tubes are connected and allowed to slide longitudinally, as and for the purpose set forth.

[For a further description of this, see another column.]

NUT MACHINE—J. C. Day, of Jersey City, N. J.: I claim the arrangement and use of the cutting die, a, the compressing dies, g h, the punches, c d, and the finishing and discharging die, b, when constructed in the manner and operated in the order set forth.

I also claim the arrangement of the projecting under side or bottom, f, of the die box, in combination with the feeding standard, C, shear-edged die box, e, and dies, a b, in such a manner that the nut burr is fed into the machine, the nuts cut therefrom, and finally discharged from the machine without the employment of any other means except the ordinary or otherwise necessary motions of the two dies, a b, substantially as described.

I also claim the arrangement of the bearing, k k, with sliding wedges, i i, which are adjusted by screws, j j, or their equivalents, for the purpose of accurately adjusting the movements of the toggle levers and links, as described.

I also claim the arrangement and combination of the sectors, R S, and cam, L, in the manner and for the purpose specified.

TURNING THE BAND PORTIONS OF CARRIAGE HUBS—Zina Doolittle, of Perry, Ga.: I do not claim the exclusive use of any of the parts taken as parts of the machine described and shown, but only in so far as the same is used in combination, for the purpose of my invention.

But I claim the exclusive use and combination of the strap wrench, D, the handle, A, and the sliding rest, C, with the cutter, H, the whole arranged and shown for the purpose set forth.

SHOVEL PLOWS—David Eberly, of Waynesville, O.: I claim securing the shares, E E, to the beam, A, by having the upper ends of their bars, D, fitted in the bars, C, the bars, D, also passing through the loops or eyes, F, of the bars, G, and secured therein by keys, i', the bars, G, being secured to the beam, A, as shown, and the whole arranged as and for the purpose set forth.

[These plows can be adjusted at a greater or less depth in the ground, and may also be arranged to throw the soil either off or on the hills.]

WINE AND CIDER PRESS—John Eiberweiser, of Cincinnati, Ohio: I claim the peculiar construction and arrangement of the platform, and the double box on a wine and cider press, constructed in such a manner as described.

CASTING HINGES—Nicholas A. Fenner, of Providence, R. I.: I do not claim generally the casting of a wire into the center of the joint of a hinge, as wires extending right through the joint have been inserted in the process of molding and casting.

Neither do I claim the casting of pivots or teats on certain of the knuckle pieces, to be received into recesses in others of the said pieces.

But I claim the employment of a separate pin for each core, when the cores are molded upon the pins, and the latter inclosed within the hinge of the casting, as described.

[We have noticed this invention in another portion of this journal.]

AIR TUBES OF FIRE-BOXES IN STEAM BOILERS—Benjamin L. Griffith, of Hazelton, Pa.: I claim the placing of air tubes within the water tables or series of water tubes, as described.

WASHING MACHINE—George Hall and John Fordyce, of Morgantown, Va.: We are aware that aprons have been used for carrying up the clothes to the washing apparatus, and that clothes have been washed between aprons. These we do not claim.

But we claim, in combination with the rubber, K, the apron, h, attached to the spring, N, at one of its ends, and to said rubber by its other end, and passing underneath the roller, n, for the purpose of turning the clothes over and over at each operation of the rubber, as set forth.

POTATO DIGGERS—Jacob E. Hardenbergh, of Fultonville, N. Y.: I am aware that shares and gratings or riddles have been employed for digging or plowing up potatoes, and separating them from the earth, and I do not claim such parts separately considered, and irrespective of the rotating arms.

But I claim the combination of the share, P, grating, Y, rotating arms, A', arranged as shown, or in an equivalent way, to operate as and for the purpose set forth.

[This is described on another page.]

CULTIVATORS—A. W. Hawley, of Milan, Ohio: I claim the movable fender, K, adjustable arm, J, and movable brace, B, with the peculiar shaped share, E, when arranged as set forth, and for the purpose of protecting the plant from injury, as specified, and for changing the share and fender to the right or left of the frame, in the manner and for the purpose substantially as specified.

TREATING PHOTOGRAPHS AND OTHER PICTURES—Ezekiel C. Hawkins, of Cincinnati, Ohio: I claim giving the front surface of the glass tablet which has an image or picture finished on its back surface, a semi-opaque and granular appearance, and consequently producing an atmospheric relief and additional painting surface, by the application of varnish, wax or other similar substance to the front surface of the glass tablet, as described.

BEDSTEAD SLATS—Samuel Hickok, of Buffalo, N. Y.: I claim two laths, A and B, placed parallel with each other, and one above the other, and connected or fastened together at or near the center, constructed and used with or without the spiral springs, substantially as described.

RAILROAD SNOW PLOW—Andrew Hotchkiss, of Sharon Valley, Conn.: I claim first, The employment of a plunger, composed substantially of a frame, D, and share, E, which is moved back out of the way, when the machine is driven into the snow to receive a load, but which may be pushed forward to force out the snow when unloading, the whole consisting a snow plow and excavator capable of being directly loaded and unloaded by the force of the locomotive.

Second, The combination of the cutting frame, H, with the frame, B, as described, so that after the machine has been run into the drift and filled, the cutting frame, H, may be swung over in front, and made to cut down through the snow, thus completely detaching that portion contained in the machine from the main body of the drift.

[Full particulars of this invention will be found in another column.]

SEWING MACHINES—George W. Hubbard, of West Meriden, Conn.: I claim the forked needle constructed and operating as described, to enchain the loops on the opposite side of the cloth or other material to that on which it enters.

[This improvement consists in the use of a forked needle, which pushes the cotton through the cloth, instead of pulling it through, as is the case with all other single-thread machines.]

CUTTING AND GRINDING CORNSTALKS—William G. Huyett, of Williamsburgh, Pa.: I claim combining an inclined grinding concave, G, with a cutting wheel, D, and disk, e, in the manner and for the purposes as described.

[By a simple combination of mechanism, consisting of a cutting wheel, toothed cone, and concave and semi-circular disk, operating together, the cornstalks are ground into a fit state for fodder.]

MACHINE FOR ROLLING CORNICE—Asa Johnson, of Cairo, N. Y.: I claim the arrangement of the series of rollers, I a J a and K a, guide, n, and rollers, h and h', and die, n', for the purpose of forming sheet metal into cornice and gutters for buildings while hot, and passing it through the machine in boiling oil as described, and for the purposes set forth.

HAND PRINTING PRESS—J. M. Jones, of Palmyra, N. Y.: I claim first, The arrangement of the various parts, so that the lever, K, can be operated at right angles to the curved bar, B, and inking bar, D, suspended on the shaft, H, in the manner and for the purposes set forth.

Second, I claim, suspending the bed, J, on the lever bar, B, in the manner and for the purposes set forth.

DYNAMOMETER—George Juengst, of New York City: I claim the connection of the loose pulley, B, with belt, R, the support, C, with the spring, g, sliding frame, D, with ring, F, and the connection of F with disk, L, by lever and ripping pawl, and with a counting apparatus, or their several equivalents, by which arrangement the amount of working power is registered for the whole time of its action, substantially in the manner as set forth.

SCREW-CUTTING MACHINE—William Kenyon, of Steubenville, Ohio: I claim first, The combination of dies which have an angular cutting extension or shoulder, c, on their front face, with the eye screw bolts, f h, and a chuck, which has straight radial grooves in its face, as and for the purposes set forth.

Second, I claim providing the peculiar oil reservoirs in the front of the chuck, between the cutting dies, in the manner and for the purposes set forth.

Third, I claim the face plate, consisting of a short hollow cylinder, with openings in its periphery, as and for the purposes set forth.

REFINING IRON—William Kelly, of Lyon County, Ky.: I claim first, Conducting the blast down through the liquid iron to near the bottom of the hearth by the tuyere pipe, C, substantially as and for the purposes set forth.

Second, I claim retining and decarbonizing crude iron simultaneously in the hearth of a blast furnace, and in an adjoining chamber having communication therewith, when the blast enters directly into but one of either of the chambers, as and for the purposes set forth.

GLASS KNOBS FOR DOORS—Charles D. Kellogg and William L. Coan, of Boston, Mass.: What we claim consists in arranging on the bottom of the cavity, e, a plate or disk of foil, in combination with arranging an annulus of foil around the mouth of the cavity, and against the glass knob, as specified.

HYDRAULIC VALVE—Alonzo R. Ketcham, of Buffalo, N. Y.: I do not claim the combination of the screw, D, geared sector, C, and valve, B, when broadly considered.

But I claim the arrangement of the chamber, F, on the pipe or cylinder, A, for the purpose of protecting the sector and valve, and to allow of a proper movement thereof, the same being operated by the screw, D, or equivalent, as described.

COTTON SEED PLANTERS—Lorenzo D. Law, of Henderson, Ga.: I claim the employment of the vibrating agitators, C C' C, each having their radiating arms arranged with respect to each other, as set forth, in combination with the longitudinal slot, E, at right angles to the axis of the radiators, as set forth.

FURNACE FOR TEMPERING SCYTHES—John E. Layton, of Pittsburgh, Pa.: I do not claim the arrangement of the body of the furnace, nor of the introducing of a current of air under the grate, as these are not novel, and have been used before.

But I claim, first, Constructing the top of a furnace in such a manner that the same, or a portion, b b, of the same, is curved or shaped so as to conform with the curve or shape of the edge of the article to be hardened, and providing in the top (thus shaped) an opening, C C, or a number of such openings, as and for the purpose set forth.

Second, I claim providing in the top of the said furnace, an opening, f f, or a number of such openings, of such a shape as to conform with the curve or shape of the article to be tempered, substantially as and for the purposes described.

Third, I claim providing on the top plate of the said furnace, two blocks, g g, with the openings, i i, as and for the purpose set forth.

SEWING MACHINES—William H. Lazelle, of New York City: I do not claim the use of the revolving hook, to form the loop, that being found in the patent of James E. A. Gibbs, June 2, 1857, to which this is an addition and improvement.

But I claim the addition to, or conjunction with, the revolving hook of the point or piece, A, attached to the feeder, which meets the point of the hook after it has caught the loop, and prevents the loop which is formed from interfering with the next loop, or from being lost, the whole made and operated as described.

IMPLEMENT FOR CUTTING METAL TUBES—Thomas J. Lloyd, of Pottsville, Pa.: I claim the collar, A, having the stock, B, fitted loosely thereon, and secured in proper position by the flanch, a, and ring, C, the stock, B, having a socket, c, attached, in which a cutter, d, and screw, e, are fitted, and the whole arranged as shown, for the purpose specified.

[For description of this invention, refer to another page.]

ARTIFICIAL FUEL—Eugene Miannay, of New York City: I claim the composition of a new coal or artificial fuel, by the said several ingredients mixed together in different proportions, called ligno-bituminous coal, and manufactured as described, for the intended given purpose.

PUMPS—Hosea Lindsey, of Ashville, N. C.: I do not claim in this application the operating of the pistons of a pump arranged at the bottom of a well, by means of a double inclined plane, as the same was shown in my patent of 1855.

But I claim the attaching of the axis, F, of the pump cylinder, A, eccentrically to a stationary circle plate, E, in combination with the attaching of the pistons, C C, of said cylinder, to said circle plate, by means of a loose ring or collar, G, connecting rod or strap, H, and sliding frame, D D, substantially as and for the purposes set forth.

CARVING WOOD—Isaac Lindsley, of Providence, R. I.: I do not claim the use of a revolving cutter and accompanying tracer, as these have long been known and used.

But I claim first, The use in carving machines of the lift and fall motion of the tracer, for the purpose of enabling the same to trace out any design, however sharp or difficult the same may be, as set forth.

Second, I claim the bar, m, lever, R, and cord, S, in combination with the cross bar, D, in the manner and for the purposes set forth.

SAW SET—Edward Marshall, of Brooklyn, N. Y.: I claim a saw set made as described.

[A description of this will be found on page 131.]

CORN HUSKERS—David M. Mefford, of Perrysburg, Ohio: I claim first, The feed drum, A, provided with ear pockets, M N O, when used in the described combination with the knife, D, and husking peg, E, for the purposes set forth.

Second, The husking rollers, F G, constructed as described, in combination with the hinged and roughened apron, H, in the manner and for the purposes set forth.

GRINDING MILL—John R. Morrison, of East Springfield, Ohio: First, I claim hanging the bed stones, C C, on cleats or pins, r r, and operating said stones by means of said pins in slots or grooves in the frame, for the purpose of adjusting the stones, as set forth and described.

Second, I claim the combination and arrangement of the lever, G, screw, h, and sleeve, n', with the stones, C C', when arranged and operated as set forth, and for the purpose described.

Third, I claim the arrangement of the runner, C', between two bed stones, C C, when said runner has a flouring dress on one side and a chop dress on the other, for the purpose of grinding different kinds of grain and feed at the same time, as set forth.

CASTING CAR WHEELS—A. A. Needham, of Rockford, Ill.: I do not claim, broadly, a rotating mold for casting, for this has been previously used for casting pipes.

But I claim casting the wheel from two different kinds of iron—hard and soft—the hard iron to form the tread, and the soft to form the hub and center of the wheel, and properly disposing the two kinds of iron within the mold, as desired, by giving the same a rotating motion, as shown and described.

[This is described on another page.]

FEED WATER ATTACHMENTS TO STEAM ENGINES—Lewis Martin, of New York City: I claim the within described arrangement of the oscillating cylinders, D, and plungers, d, within a wheel, A, whereby the plungers, when moving outward are subjected to the full boiler pressure in every direction or held in perfect equilibrium, in the manner above described and for the purpose set forth.

GIVING MOTION TO VALVES OF STEAM ENGINES—H. O. Perry, of Buffalo, N. Y.: I claim, first, The above described method of shutting a rolling or partially rotating valve by pulling on a link so attached to it, at its effect in rotating the valve decreases as the valve assumes its most desirable shut position, and tends to revolve it in the reverse direction, when the valve revolves by momentum past such position, when operated substantially as and for the purpose set forth.

Second, I also claim the above described method of operating said link by the pressure of the steam, so that the whole amount of power available in shutting shall be always proportional or very nearly proportional to the resistance for the purpose of enabling the valve to stop in the proper position under all pressures of steam, as set forth.

CASTING GAS RETORTS—Abiel Povey, of Lowell, Mass.: I disclaim the general principle of the formation of a mold, without patterns, by sweeping, or without flasks, as such is well known and forms no part of my claim.

Neither do I claim hanging cores in the cope or setting them for casting kettles in the ordinary manner, as that also forms no part whatever of my invention or claim.

But I claim my described flask, composed of the several parts, A B C, and former, H and I, constructed and relatively arranged and operated for molding the retort, and for self-centralizing and setting the core, essentially in the manner as set forth and described.

GOVERNORS FOR MACHINERY—George M. Phelps, of Troy, N. Y.: I claim causing the described centrifugal governor, or its equivalent, to regulate the rotary motion of a shaft with which the governor is positively driven by making the governor control by means of a valve the motive action of a current of air or other gaseous fluid upon a piston, or an analogous device, arranged to work the mechanical contrivance by which the speed of the said shaft to be regulated is immediately changed, substantially as set forth.

CULTIVATORS—John Righter, of Clarksburg, Ga.: I claim the employment of the pinions, e and f, when in combination with the screw shaft, b, and teeth or plows, a a, substantially in the manner and for the purposes set forth.

MACHINE FOR BENDING HORSE-SHOES—Elbridge Wheeler, of Marlboro', Mass.: I claim the described machine for bending horse-shoes, consisting essentially of the following elements in combination, or their substantial equivalents. The traveling carriage, C, the bending levers, M, and the regulating cam, o, operating in the manner substantially as set forth for the purpose specified.

APPROACH OPENING FARM GATE—C. W. Smart, of Watertown, N. Y.: I do not claim, broadly, the actuating of a bolt or catch, and the opening and closing of a gate automatically by the passing of the wheels of vehicle over levers or projections to actuate mechanism arranged for the purpose, for various plans have been devised for effecting this object. Nor do I claim the arrangement of levers and cords for withdrawing and then pulling open the gate, as in J. K. Webber's patent, 1855.

But I claim the combination of the slide bolt, F, and spring, E, arranged and actuated as shown, or in any equivalent way, so that by the withdrawal of the slide bolt, the spring will be wound up or contracted, and have sufficient strength to throw open and close the gate by the time the bolt is fully withdrawn, and the gate released.

[This invention consists in combining the catch or bolt which secures the gate, in an open and closed state, with a spring which actuates the gate, the parts being so arranged that as the catch bolt is withdrawn, and the gate released, the spring will, by the same mechanism, be wound up, and receive sufficient strength to actuate the gate.]

OSCILLATING ENGINES AND PUMPS—Gambrill Sprenkel and Thos. W. Basford, of Harrisonburg, Va.: We claim the arrangement of the pump, in such relation to the main cylinder and crank of an engine, that its pistons and valves shall be operated simultaneously with the piston and valves of the cylinder, and by the same means that actuates them.

Second, The peculiar arrangement consisting of boxes with inlet and outlet passages, C 5, C 5, hollow trunnion with two chambers, d d, formed by diagonal partition, c, and with two sets of ports c 1, c 2, c 3, c 4, substantially as and for the purposes set forth.

CLOTHES' RACKS—S. J. Russell, of Chicago, Ill.: I am aware that adjustable rotating arms forming a clothes' dryer are not new, and I do not broadly claim them. An example is seen in S. Woodward's patent, 1854, and in J. Higgins' rejected application, 1855.

Nor do I claim the hollow post or any portion of either of the above mentioned devices, nor do I claim indiscriminately the counterpoising of all descriptions of objects.

But I claim the arrangement within the hollow base, B, of a counterpoising weight, d, connected by a cord with the rising and falling rod, D, for the purpose of balancing or nearly balancing the hub, E, and arms, k, and thus preventing the sudden fall and breakage of the parts, as well as rendering them easy of operation.

I also claim as new in clothes' dryers the employment of a spring, h, attached to the base, B, and acting against the shaft, A, all in the manner and for the purposes set forth, and not otherwise.

[This invention has for its object the adjustment of the rotating frame, so that the clothes can be taken off and put on with ease.

APPARATUS FOR ILLUSTRATING CONIC SECTIONS AND THE LINES OF THE GLOBE—Forrest Shepherd, of New Haven, Conn.: I claim the combination of the globe, with an extended horizon or surface as the base or convex surface of the cone, or any other extended surface on which may be written any geographical or other exercise with the globe, and be easily wiped or rubbed off, when constructed, arranged and combined substantially as described.

I also claim the combination of the globe with the cone when the cone is made in three or more segments, and the upper segment so cut as to illustrate the conic sections, and the whole is constructed, arranged, and rendered susceptible of the various uses as described and set forth.

PORTABLE FIELD FENCE—H. T. Shanard, of Wayne, Mich.: I claim attaching or securing the fence to the ground substantially as shown and described, to wit, by means of the inclined bars or braces, D D, attached to the posts, and connected by cross-ties, E E, in connection with the stakes, F, provided with mortises and the wedges, G.

[By means of inclined braces or supports and cross-ties secured to, stakes driven in the ground a very portable fence is obtained.]

MACHINE FOR TURNING THE LEAVES OF BOOKS—F. Suter, of Brooklyn, N. Y.: I claim, first, The arrangement of the lever, H, with the described mechanism operating in the manner specified, for the purpose of taking hold of the music leaf, turning the same over, and afterwards letting said leaf loose again, and dropping down so as to pass under the same, in the manner substantially as described.

Second, I claim the fingers, 3 and 4, operating in the manner and for the purpose [redacted].

CHURN—Wm. H. Truesdell, of Elgin, Ill.: I do not claim the introduction of atmospheric air into the body or mass of cream while being agitated or churned, in order to expedite the formation of butter, for this has been previously done, and in various ways

Nor do I claim broadly the idea of adjusting the dashers in churns.

But I claim the employment of the peculiarly formed dashers, D, having air tubes, j, attached, said dashers being so made as to churn and introduce the air when turned in one direction, and presenting chambers for the collection of the butter, when the direction is reversed.

[This invention is designed to collect the small particles of butter which usually escape when a horizontal dasher is employed. This dasher is caused to slide upon its axle, and by a gentle rotation the buttor is collected.]

CHURN—James Vandolah and Elias Curry, of Dillsborough, Ind.: We claim the construction of the dasher, with the rim, c, wings, d d, peripheral strips, f f, and horizontal plates, g g, arranged and operating substantially in the manner and for the purposes specified.

We also claim the arrangement of the ribs, I I, with retaining hoops, k k, or their equivalents, so as to render them adjustable and removable, substantially as and for the purposes specified.

HARVESTERS—Wm. Webber, Jr., and John Webber, of Rockton, Ill.: We claim communicating motion from the main shaft, a, of the driving wheel to the cutter blade, by means of the intermediate shafts, c d, arranged parallel with each other on opposite sides of the bearing wheel, A, in such a manner that pulleys on the after ends of said shafts may be banded to each other, and a regulating fly wheel be combined with the shaft, d, the whole being constructed and arranged for joint operation, substantially in the manner and for the purpose set forth.

CULTIVATORS—Lorin Wetherell, of Worcester, Mass.: I claim, in combination with a plow, H, the pair of revolving hoes or scrapers, having a vertical adjustment in addition to the adjustment of the edges thereof, so that the capacity of the machine may be increased with the increasing hight of the plants to be cultivated by it, substantially as set forth.

MODE OF BELTING—Benj. Chester, of New York City assignor to W. H. Burnap, of Lowell, Mass.: I do not claim an intermediate pulley, between a driving pulley and a pulley to be driven by an endless belt, when such intermediate pulley is merely a guide pulley.

Nor do I claim broadly the winding of belts several times around the peripheries of windlasses, for the purpose of obtaining additional friction. Examples of ropes and chains thus arranged may be seen in Dingle's Polytechnic Journal, vol. 81, page 4; H. O. Nicholls' device rejected, 1845, and that of Richards & Winsor, 1854.

But I claim the arrangement and combination of a pulley, C, with the pulleys, A B, when the driving belt, after passing around the small pulley, B, is led therefrom to and around the pulley, C, thence around pulley, B, to and around pulley, A, as and for the purposes described.

[A description of this invention will be found on another page.]

METHOD OF GOVERNING THE CUT OF CIRCULAR SAWING MACHINERY—A. C. Martin and Mahlan M. Wombaugh (assignor to A. C. Martin and R. Ashcraft), of Cincinnati, Ohio.: We claim the mandrel, C, when working in governable circular joint, swivel boxes, B B, in combination with angular guide, F, and lever, E, when arranged substantially in the manner set forth for the purposes specified.

We also claim the side end or lateral swinging movement of plummer blocks, B B, when arranged substantially as set forth.

[In another part of our paper a description of this will be found.]

CROSS-CUT SAWING MACHINE—G. R. Moore (assignor to himself and C. G. Sargent), of Westford, Mass.: I claim, first, The peculiar method of hanging the inverted saw within its gate by means of the guide wheels, S, and block, r, as set forth.

Second, I claim the depressing the middle section of the horse, in the manner and for the purpose described.

Third, I claim driving the saw by means of the segment, O, and straps, N, in the manner and for the purpose specified.

Fourth, I claim uniting the ratchet wheel, y, to its shaft, by means of a friction clutch, in the manner and for the purpose set forth.

CUTTING THE ZIG-ZAG GROOVES IN THE STILES OF WASHBOARDS—O. L. Reynolds (assignor to H. F. Snow) of Dover, N. H.: I do not claim zig-zag cutting wheels as my invention, for I am well aware that they are old.

But I claim the method described of cutting or forming the grooves in the stiles or side pieces of washboards, in which corrugated metallic rubbing surfaces are employed.

[A notice of this will be found on another page.]

LIGHTING GAS BY ELECTRICITY—Saml. Gardiner, of New York City: I do not confine myself to the particular method described of accomplishing my object.

But I claim, broadly, turning on or shutting off inflammable gas by degrees or gradually through the agency of electricity, for such purposes as before alluded to.

[This improvement will be found described in another column.]

VEGETABLE CUTTERS—Wm. Robinson, of Highgate, Vt.: I claim the employment of hooked cutters, running at different velocities on parallel cylinders, the whole being arranged and combined in the manner and for the purposes set forth.

RE-ISSUE.

AUTOMATIC GRAIN WEIGHING MACHINE—Rufus Porter, of Washington, D. C. Patent dated May 5, 1857: I claim, first, The combination of the tripping rods, S, with the valve plate, N, and knuckle braces, i and j, whereby the movement of the valve gate, L (which is operated by means of scale beams, F) causes the contents of the buckets, E, to be discharged alternately, as set forth.

Second, The knuckle braces, i and j, in combination with the trap doors, m, whereby the latter are spontaneously closed and fastened immediately after the grain is discharged, as set forth.

Third, The balance beams, F, with horns, I, in combination with valve plate, N, and catch levers, T, so arranged that the weight of grain in one bucket changes the position of the valve gate, so as to turn a portion of the current of the grain into the other bucket before the first bucket receives the quantity the second horn trips the catch, and thereby turns the balance of the current of the grain into the other bucket as set forth.

ADDITIONAL IMPROVEMENT.

SKATES—Ferdinand Klein, of Newark, N. J. Patent dated April 1, 1856: I claim casting in one piece the bar, A, heel plate, B, and loop, e', having a point, g, which assists to support the bar, A.

Secondly, I claim forming the obtuse angles, a b c, and a' b' c', of the bar, A, to prevent the stock or wood of the skate from separating, substantially as described and shown in the drawings.

DESIGNS.

TRADE MARKS ON PLOW SPRINGS, &c.—James D. Willoughby, of Pleasant Hall, Pa.

CLOCK FRONTS—Elias Ingraham, of Bristol, Conn.

COOKING STOVE—Jacob Steffe, James Horton, and John Currie, of Philadelphia, Pa., assignors to M. W. Jackson and W. H. Woolen, of Berwick, Pa.

NOTE.—The above List of Claims indicates that the times have not materially affected inventive genius, and why should they? On the contrary, we have noticed in years gone by, that when trade generally was most depressed, and mechanics were out of employment, and consequently had the smallest incomes, then it was that the business of the Patent Office was the greatest, thus proving the old adage that "Necessity is the mother of Invention." No man knows what he can accomplish until placed in some emergency, out of which he is obliged to work his way. It is so with many who have recently secured patents. They did not know they had the talent for inventing until necessity compelled them to do something for a livelihood, and as they were out of employment, they fortunately took the advice they had often read in our columns, and made an invention, got it patented, sold rights, and are now in a position to snap their fingers at the hard times.

In the foregoing list, we recognize the names of TWENTY-THREE—more than one-third of the entire number—whose patents were secured through the Scientific American Patent Agency.

Drying Bricks by Artificial Heat.

MESSRS. EDITORS—As every one now looks to the SCIENTIFIC AMERICAN for improvements and discoveries in art or science, I will give you the result of a series of experiments which I have just completed to dispense with the usual method of drying bricks by exposure to the sun—substituting in its stead a proper application of artificial heat. The process is so simple that it will ere long, I think, revolutionize the business, at least in the large cities, or where there is a market for a large quantity.

Imagine a tunnel one hundred and fifty feet long, four feet wide and five feet high, fitted with a railway and train of cars extending its entire length. The cars descend by their own gravity, having declination sufficient to give motion with a slight exertion of force. Near the mouth or entrance is a smoke stack, communicating through the floor, and near the opposite end or exit is a furnace. As the bricks are molded they are placed on the cars, each containing 180 bricks, which, when filled, are shoved into the tunnel, and thus push each other along, requiring seven or eight hours to make the passage. I have taken them out perfectly sound, and as dry as if they had been exposed to the sun for a week.

It will be seen that this method meets all the requirements. The stack being at one end and the fire at the other, a strong current of air is created running the entire length of the tunnel. The bricks first need the air rather cool—if otherwise, they would crack—and as they advance, the moisture is liberated and carried off. In two or three hours, they begin to feel the heat, but they are then partially dry, and able to bear it, and so on until they emerge from the tunnel perfectly dry, and are borne off to the kiln.

Every brickmaker will appreciate the importance of this. The business may now be carried on under cover, and free from the vicissitudes of weather. Instead of being limited to five or six months in the year, ten or eleven may be secured. There is nothing to prevent operations on this day (December 15), or, in fact, whenever the temperature is not down to the freezing point. This, of course, requires the molding to be done by a machine, as the cold clay cannot be handled.

Drying floors being no longer needed, brick-works may now be established in many a spot hitherto impracticable, as you only require room for the kilns, and a shed one hundred feet long. About twenty feet of the tunnel must be of brick; the remainder, with the smoke-stack, may be of lath and plaster, or any other cheap material. The cost of a tunnel, with the cars, &c., to turn out 25,000 bricks per day will be about $1200 or $1500, which is much less than the floors, sheds and other requisites of a yard in the present mode.

I have here given the mere outlines. Those wishing further information can address me by mail.

FRANCIS H. SMITH, Baltimore, Md.

[If this improvement secures all the objects specified by our correspondent, it is certainly of great importance to brickmakers. During the early part of last summer, the weather continued cold and wet, preventing many of our brick manufacturers from carrying on their usual amount of business. In one case known to us, the weather disabled an extensive manufacturer from fulfilling a large contract, and he was thereby subjected to a considerable loss. Had he been in possession of the above information furnished by Mr. Smith, he would have been enabled to meet his engagements with profit instead of loss to himself and others.

Eclectic.

This word is now in almost daily use, and is found on the title page of many works professing to have for their aim the advancement of true knowledge and civilization. It is derived from a Greek word which was applied to a school of philosophers who endeavored to select from the systems of various schools those doctrines which alone are true, and to present them in the form of an entire whole, calling them eclectic principles.

Pluto and Aristotle may be said to have been eclectic in their views, but the chief of ancient eclectics lived under the Roman empire, the most celebrated of them being Epictetus, who lived in the year 60, A. D., and Plutarch, who wrote a series of biographies of great men. The most striking example of a philosopher of this school in later days is M. Victor Cousin, a French professor of the mental sciences.

At the present day, when physical science has made such vast strides in the onward march of truth, it has been necessary for eclecticism to step in and act as a kind of check to prevent us from rushing into false theorizing and wild speculation; and in no branch is this more necessary than in medicine, where every new quackery which starts up around us finds some believers. It is therefore requisite for the well-being of the body, that calm and cautious men should examine the facts supporting the system thoroughly, so that any grains of truth there may be in it may be used for the good of the world, and all the chaff may be blown to the winds.

Occult Science.

The age of research and investigation in which we live has entirely done away with the chimeras of the ancient alchemists, astrologists and others of the same class, except amongst the most ignorant and degraded of the community. Yet we must not hold them in disrespect, as they were the germs of two of the noblest of our modern fields of inquiry, namely, chemistry and astronomy.

Monoliths.

This is a name given to a monument or pillar composed of a single stone. They were common in ancient times, the obelisk of Luxor now in Paris being an illustration.

Painting on Glass.

There is a common opinion that the ancient art of glass-painting is completely lost. This, however, is so far from being true, that it is now carried to a much higher degree of perfection than ever before, except in one particular color, and even that is very nearly approached to. We can blend the colors, and produce the effects of light and shadow, which the ancients could not do, by harmonizing and mixing the colors in such a manner, and fixing by properly enameling and burning them, that they shall afterwards become just as permanent as those of the ancients, with the additional advantage of superior art. In modern times, glass-painting has been carried to the greatest perfection at Zurich. The process is effected chiefly by colors derived from metals. The colors are laid on by fluxes, as soft glass and easily vitrified bodies. The colors are affixed by annealing the metals to the glass.

Recent Patented Improvements.

The following inventions have been patented this week, as will be found by referring to our List of Claims on another page:—

SNOW PLOW.—Andrew Hotchkiss, of Sharon Valley, Conn., has invented a new plow for excavating snow. It can be used as an ordinary snow plow in light snows, and when a deep snow occurs, or the snow accumulates in a cutting, one of these plows attached to the front of the locomotive will act as an excavator, and dig the snow away in blocks.

POTATO DIGGER.—A new potato digger has been invented by Jacob E. Hardenburgh, of Fultonville, N. Y., which consists in the combination of an adjustable share and grating, with horizontal and revolving arms, on a suitable framing and wheels, arranged relatively with each other, to dig the potatoes and throw them in ridges on the surface of the ground.

GALVANIC GAS LIGHTER.—This apparatus (which will be found fully described and illustrated on page 320, Vol. XII, SCIENTIFIC AMERICAN) is the invention of S. Gardiner, Jr., of New York City. It consists in placing a fine coil of platinum wire over the burner, which is made red-hot by the passage of the electric force, and the gas impinging on it becomes ignited. By this means any number of burners may be turned on and lighted instantaneously. It is a valuable invention.

EXTENSION TABLE.—This table has slides of sheet metal plate, which are bent so as to form tubes, each of which has externally a dovetail tongue on one side, and an inversely corresponding groove on the inner side, so that the tongue of one slide will fit into the groove of the other. By this means the perfect working of the slides is obtained, and the table is rendered stiff and firm; it is not likely to get out of repair. It is the invention of Edwin A. Curley, of Westport, Conn.

CUTTING SLOTS FOR STILES IN WASHBOARDS.—O. L. Reynolds, of Dover, N. H., assignor to Hiram F. Snow, of the same place, has invented an improved machine for cutting zig-zag slots in the stiles or hill pieces of washboards, to receive the ends of the corrugated sheet metal plate. It consists in having a wheel provided with a zig-zag cutting edge placed on a shaft over a bed having a longitudinal groove made in it to receive the stiles or side pieces. The wheel, as it is turned, cuts the zig-zag curves or slots in the stiles.

SAW-SET.—The class to which this saw-set belongs is that in which a punch is employed to bend or give the set to the teeth of saws. The invention consists in attaching the punch to a swinging or vibrating bar, which is operated by a cam and spring, and using in connection with it a beveled inclined bed and set screws, whereby a greater or less set may be given to the saw as desired, and the implement may be applied to the saw with the greatest facility, thus setting saws in an expeditious and perfect manner. It is the invention of Edward Marshall, of Brooklyn, N. Y.

IMPROVEMENT IN BELTING.—The object of this invention is to prevent the slipping of belts on small pulleys when driven by a larger one. It consists in leading a belt from the large pulley round the back, to and round an intermediate pulley on a third shaft; from this intermediate pulley the belt is carried back again around the small pulley to the large one. By this arrangement the smallest pulley can be driven by a large one without any danger of the belt slipping. The arrangement is the invention of Benjamin Chester, of this city, who has assigned it to V. H. Burnap, of Lowell, Mass.

CUTTING METAL TUBES.—This invention consists in having a metal collar provided at one end with a flanch, which fits in a recess in a circular stock fitting loosely on the collar. The opposite end of the collar has a ring secured upon it, by a screw passing through them both, and pressing against the tube to be cut, which is fitted inside the collar. The stock is fitted and works between the flanch and ring, and a cutting tool is placed in a socket attached to the stock. The tube is cut by rotating the stock on the collar, the cutter being fed to its work by a screw worked by hand. It is especially applicable to cutting gas tubes, and is the invention of T. J. Lloyd, of Pottsville, Pa.

CASTING HINGES.—The object of this invention is to produce a hinge in which all the advantages of the best drilled and wired hinges are obtained, and which is, in some respects, superior, at a cost scarcely exceeding that of the pivot hinge, which is formed by casting the two parts together, with teats and corresponding recesses at the center of the joint. The invention consists in the introduction of a wrought iron pin, or pins, into the center of the joint, by the molding and casting process, in such a manner that they extend through the knuckle or knuckles of one leaf of the hinge, and protrude so as to form pivots entering into, but not passing through, the knuckles of the other half of the hinge. It is the invention of Nicholas A. Fenner, of Providence, R. I., and assigned to the N. E. Butt Co., of this city.

CIRCULAR SAW MACHINE.—This invention consists in attaching the saw guides to a forked or V-shaped bar, which is fastened to a collar on the saw arbor, and having the pillar blocks which receive the bearings of the arbor pivoted to the frame; the bearings being fitted in the pillar blocks in a peculiar way, and the outermost pillar block and bearing being rendered adjustable longitudinally, whereby a longitudinal play or movement is allowed the saw arbor, and consequently a lateral play is allowed the saw, so that it may conform or give to the spring of the log; and the "dip" of the saw is regulated, or more or less "clearance" can be given it, as may be required. It is the invention of A. C. Martin and Mahlan M. Wombaugh, of Cincinnati, Ohio, who have assigned it to A. C. Martin and R. Ashcraft, of the same place.

CASTING CAR WHEELS.—A. A. Needham, of Rockford, Ill., has invented a new method of performing this operation, by which he overcomes the difficulty hitherto attending the casting of perfect car wheels, in consequence of the unequal cooling of them, produced by casting with a chill, in order to harden the periphery. Wheels cast with a chill are liable, from the cause above alluded to, to crack, and the iron prevents it from assuming that crystalline structure of cast iron which is best adapted for strength. The invention consists in using two different kinds of iron, hard and soft, and having the mold placed within a revolving flask, the melted hard iron being first poured into the mold, which, by centrifugal force, will be pressed hard to the edge of the mold, thus forming a periphery of hard iron; the softer iron can be afterwards poured into the mold, to form the body of the wheel, and the whole being allowed to cool gradually, the wheel will contract equally throughout its mass.