

He is authorized to employ the skill and experience of others to aid him. They necessarily become possessors of his views and plans, and to allow them to become the patentees of essential features of the invention would render their employment dangerous and retard the progress of improvement.

Under all the circumstances we think that as between the two, the priority of invention must be accorded to Mudge.

SERIOUS OBJECTION TO MUDGE CASE—MORE THAN TWO YEARS DELAY—QUESTION FOR A JURY.

4th. The most serious objection to the release is that Mudge has abandoned his right to a patent of a delay of more than two years to make his application for it after the invention has been introduced into public use. In the fall of 1862, and in the spring and summer of 1863, both Mudge and Suggett made several wells in the way specified in the application, and they have been in successful public use up to the present time, and Mudge delayed to make his application until August, 1865. This, as a general rule, would be conclusively against him. But he alleges in answer that, although his devices were effectual in the gravelly soil of Cortland village, he could not thence infer that their operations would be in other soils and under different circumstances. That it also required time to test the durability and permanent success of his method. That in many cases he had failed, and in quick sand and clayey soils, other modifications are required which have not yet been fully matured; and that the uses of his device previous to his application were necessary experiments to perfect the invention and make it generally useful. The question thus presented can be much more properly investigated and determined by a court of law than by us, and the only way in which it can be presented to such court is by the allowance of the applicant's claim. The unusual difficulties and complication of the case, and the great merit of the applicant, to whom the public are much indebted for a valuable improvement, have induced us to give this direction to the case.

Recent American and Foreign Patents.

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

**THE SHAW AND JUSTICE HAMMER.**—We have published illustrations with descriptions of this hammer and the advertisement of the manufacturers is to be found on another page. A few days ago we had an opportunity to witness its operation. It was a 100-pound hammer set up at the Morgan Iron Works, this city. In three minutes an ingot of six inch square wrought iron was drawn down to two inches, although the heat was not a perfect one. The experiment was witnessed by a number of practical men, who expressed themselves well satisfied with the operation of the hammer. It appears to be an excellent auxiliary to the work of the forger and is rapidly coming into favor.

**DEVICE FOR ROASTING CORN AND OTHER SUBSTANCES.**—N. L. Whitney Effingham, Ill.—This invention has for its object to furnish an improved apparatus for roasting coffee, and similar uses, which shall brown the article roasted evenly and thoroughly, and shall at the same time prevent the aromatic flavor of the coffee from being dissipated by the heat.

**VALVE COCK.**—Thomas Barber and John Barber, Brooklyn, N. Y.—This invention consists in so constructing and arranging the parts of a valve to be used for steam water or gas, that no packing shall be required to keep it tight when it is in use.

**NECK YOKE TRUNDLE.**—A. H. Cole, Sylvania, Ohio.—This invention has for its object to furnish an apparatus by means of which the breast strap of harness may be preserved from being so quickly worn out by the friction of the neck yoke rings.

**AERIAL RAILROAD.**—J. A. A. Fontaine, New York City.—This invention relates to a novel application of steam power to a railroad car which is propelled on an elevated track, the weight being diminished or rendered negative by the attachment of a balloon to the said steam car.

**WATER WHEEL.**—Geo. Arrison, Trenton, N. J.—This invention consists in the arrangement of additional buckets between the ordinary buckets of water wheels, said additional buckets being adjustable by means of set screws in such a manner that by raising or lowering said adjustable buckets or gates, the water spaces of the wheel can be regulated according to the aggregate amount of water passing through the wheel and said water can be used to the best advantage.

**CULTIVATOR.**—W. F. Clark, Hagamans Mills, N. Y.—This invention consists in a novel and improved construction of the cultivator, whereby the ground will be acted upon in the most efficient manner and the device be under the complete control of the driver.

**SOAP.**—Justin Ryan, Waukegan, Ill.—This invention relates to a soap compound which is cheap and has superior detergent qualities and which is of such a nature that it hardens in very short time and is fit for use a few hours after it has set.

**SAW MILL.**—Wm. Yaman, Connorsville, Ind.—The nature of this invention consists in constructing a saw mill in such a manner that flat or square pieces may be sawed from the log one at a time until the whole log is worked up.

**FLOW ATTACHMENT.**—H. B. Smith, Eureka, Ill.—This invention relates to a sulky attachment for plows, and it consists in a novel construction and arrangement of parts, whereby any ordinary plow may, with a very moderate expense, be converted into a sulky plow or have a sulky attachment applied to it and one which will admit of the driver having complete control over the plow.

**PADDLE PROPELLER.**—Jordan H. Phillips, St. Louis, Mo.—This invention has for its object to furnish an improved apparatus for propelling vessels so constructed and arranged that the paddles shall enter the water without any jar and leave it without lifting any water, the whole power being expended in propelling the vessel.

**WINDOW-SASH SUPPORTER.**—Benjamin Britten, Galena, Ill.—This invention relates to an improved device for supporting window sashes in the frame and consists in a combination of two levers with a spring attached to a metal case which is let into the window frame horizontally, one supporter for each sash. The supporter for the upper sash has its thumb piece for depressing the catch within the seat of the lower sash, lying flat and flush with the frame so that it presents no obstacle to the movement of the sash up and down.

**TEAKETTLE, ETC.**—William A. Munn, Milwaukee, Wis.—This invention consists in attaching the spout to the side of the vessel with a double seam.

**COMBINED GRAIN SEPARATOR AND STRAW CARRIER.**—Alvin T. Dunbar and Archibald McNaught, Alba, Pa.—This invention has for its object to furnish an improved apparatus, durable and simple in construction, for separating the grain from the straw as they come from the threshing machine.

**HORSE HAY RAKE.**—Orris Pier, Winhall, Vt.—This invention has for its object to improve the construction of Pier's horse hay rake patented September 13, 1859, so that it may better adjust itself to the roughness and inequalities of the ground.

**CAST-IRON FENCE POSTS.**—Richard Ketcham, South Dansville, N. Y.—This invention has for its object to furnish an improved cast-iron fence post so constructed as to hold the boards or rails of the fence securely without the use of nails.

**GATE.**—Jerome Hibbard, Prospect Lake, Mich.—This invention has for its object to furnish an improved gate, simple in construction and convenient in operation.

**JOINER'S GAGE.**—George T. Lape, New York City.—This invention relates to joiner's gages for the purpose of rendering them more useful and convenient, and consists in combining two rectangular bars which are tongued and grooved and form a square gage bar on which a head block moves by rack and pinion in such manner as to admit of the nicest measurements on a graduated scale between the head block and the marking point. The double gage bars are also made to slide upon each other so as to separate two marking points to any required distance for gaging a mortise or any similar work with two parallel lines.

**STEAM BOILERS.**—J. Wyatt Kied, New York City.—This invention consists in constructing a steam boiler in such a manner that a greatly increased steam generating surface shall be obtained without materially increasing the size or interfering with the most compact form of boiler.

**PNEUMATIC SEWERAGE.**—Charles T. Lierneer, Frankfort-on-the-Main.—The object of this invention is to empty privies and their pipes at any moment by connecting them with an air-tight reservoir sunk in the street by means of pipes which are provided with stop cocks in such a manner that when all the stop cocks are closed the air can be exhausted from said reservoir and by opening one of the stop cocks after the other, the contents of the several privies are sucked into said reservoir without the least inconvenience from the emission of a bad odor.

**CALIPERS AND DIVIDERS.**—Andrew V. D. Westervelt, New Brunswick, N. J.—This invention consists in attaching a worm and worm wheel to a pair of calipers, dividers or compasses, for the purpose of opening and closing the legs and graduating them exactly in making measurements of either internal or external work.

**CLOTHES LINE AND FASTENER.**—Albert D. Rust, Vernon, Mich.—This invention consists in forming the line of wire in a series of links which allow it to be folded up in small compass for packing away and transporting, and in connection therewith a wire fastener or holder so constructed that any number required may be hung on the wire line and all remain suspended permanently in a yard unaffected by the weather.

**SELF-ADJUSTING SCRAPER.**—Ira Munson, Wayne, Mich.—This invention has for its object to furnish a self-adjusting scraper so constructed that the team can be driven and the scraper operated by one man, thus dispensing with the services of the one or two additional men required when an ordinary scraper is used.

**DEVICE FOR STIRRING, HEATING AND COOLING LARD, ETC.**—Giles B. Williams, New York City.—This invention relates to a device for stirring lard, during the process of heating and cooling and also for stirring and agitating various liquids and it consists in the employment of a horizontal screw placed in the lard receptacle and arranged in such a manner as to keep the lard in constant motion. The invention also consists in using in connection with the screw a double-walled lard receptacle through which hot or cold water or steam may be passed for the purpose of heating and cooling the lard.

**WASHING MACHINE.**—Milo J. Parsons, Hillsdale, Mich.—This invention consists in the combination and arrangement of the crowned springs, flat springs or bars and standards, by means of which the rollers are suspended and held up against the stationary revolving cylinder in such a way that they can adjust themselves to the varying thickness of the clothes passing between them and the said cylinder.

**CORN HARVESTER.**—August Moravek, Rosnyo, Hungary.—This invention relates to a machine for harvesting maize or Indian corn, and it consists in a cutting device, endless elevating apron, and a discharging platform, all arranged and applied to a wagon, so as to operate in a perfect manner.

**FOOT REST FOR HORSES.**—John E. Tucker, Montfort, Wis.—This invention is designed for a rest or block, on which to place a horse's foot whilst dressing the hoof, clenching the nails, etc., in horse shoeing.

**FASTENER.**—P. Rosenblatt, Greenville, Tenn.—This invention relates to a fastener for doors and windows which is exceedingly cheap to manufacture, simple in construction, and very efficient and reliable in operation.

**GATE FASTENING.**—James D. Bourne, Dewitt, Iowa.—The object of this invention is to provide a fastening for a gate, which can be readily operated, so as to free the gate by a person either walking or riding on horseback, and which, when performing its function as a fastener, will hold the gate secure against its being opened by any kind of cattle or stock, or by the action of the wind.

**CULTIVATOR PLOW.**—G. W. Hatfield, Holton, Ind.—This invention relates to the construction of a cultivator plow, whereby the implement is rendered capable of being adapted to various kinds of work, and by a very simple adjustment of parts.

**ATTACHING THILLS AND DRAFT POLES TO AXLES.**—David Dalzell, South Egremont, Mass.—This invention relates to a thill and pole coupling of that class in which the connection is made directly to the iron axle, and not to the wooden bed thereof. The invention has for its object the avoidance of wear and tear, and the consequent rattling of the parts composing the coupling, the exclusion of dust from the internal parts, the impossibility of a casual disconnection, and a perfect lubricating of the same at all times.

**PNEUMATIC BRAKE FOR RAILROAD CARS.**—Charles R. Peddle, Terre Haute, Ind.—This invention relates to a means for operating the brakes of railroad cars by compressed air forced into the air cylinders underneath the cars by the locomotive, without any essential modification of the working parts of the latter, a valve and air pipe being simply connected to the steam chest of the steam cylinder. The object of the invention is to obtain a simple and economical means for operating instantaneously the brakes of all the cars of a train, and placing the brakes under the complete control of the engineer.

**HANDLE ATTACHMENT FOR SHOVELS, ETC.**—James N. Pease, Panama, N. Y.—This invention consists of a handle constructed and arranged in such a manner that it may be applied to the handle or stale of a shovel, manure fork, hay fork, or other similar implement, and greatly facilitates the manipulation thereof.

**SECURING BOXES IN METALLIC HUBS FOR WHEELS.**—James B. Stuart, Bunker Hill, Ill.—This invention relates to a mode of securing boxes in metallic hubs for the wheels of carriages and other vehicles, and has for its object the securing of the box in the hub, in such a manner that they may be adjusted concentric with each other, and without any possibility of the box slipping within the hub, and the former rendered capable, if worn by use, of being readily removed from the latter and a new one inserted in its place.

**CULTIVATOR AND SEED SOWER.**—Thomas L. Whitbeck, Kenosha, Wis.—This invention consists in so combining a seed sower and cultivator, that each may be used separately or both at the same time, as the nature of the work to be done may require. It more particularly consists in the simple, cheap, and novel manner by which the slide in the bottom of the seed box is operated for agitating and regulating the flow of seed to the openings of the discharge cylinder, by the vibration of the tongue or pole by which the machine is drawn.

**GAS APPARATUS.**—James F. Spence, Williamsburg, N. Y.—This invention consists in the arrangement of a series of S-shaped pipes in the interior of a hollow drum which revolves in the interior of a vessel partially filled with oil, in combination with a suitable oil supply pipe and with a steam pipe, in such a manner that by the action of the steam the oil or volatile hydrocarbon liquid in the vessels is vaporized, and as the drum revolves a mixture of steam and hydrocarbon vapors is blown out through the S-shaped pipes in the upper space of the outer vessel, whence it is conducted through a suitable pipe to the burners.

**BURGLAR PROOF LOCK.**—Joseph Corbett, Utah Territory.—This invention relates to a burglar proof lock of that class which are provided with annular rotating tumblers combined and arranged in such a manner as to be capable of being adjusted to effect a great number of changes, that is, different manipulations of the knob in order to unlock the lock.

**CULTIVATOR.**—Thomas Jobe, Clarksville, Ohio.—This invention relates to a cultivator for general purposes, which may be used for plants grown in hills or drills, or used for eradicating weeds and rendering the earth light and pliable preparatory to the sowing of grain.

**CLOTHES LINE STAND.**—J. E. Elliott, Grand Rapids, Mich.—This invention consists in a novel construction and arrangement of the clothes line stand, whereby when so desired, the said arms can be tilted, for the better and more convenient passing of the line around it, and the hanging of the clothes upon such line.

**SAWTEETH.**—James E. Emerson, Trenton, N. J.—This invention relates to an improvement on a swage, and consists in a modification of the swage, whereby the implement is adapted for forming and sharpening a tooth, having a cutting edge of peculiar and improved form.

**GRAIN DRILL.**—Peter Schmitt and Peter Jacob Schmitt, Waterloo, Ill.—This invention relates to the construction and arrangement of the longitudinal shaft, which is placed with the seed box, said shaft being provided with blocks by which the holes in the bottom of the seed box are alternately closed and opened, whereby the feed is made regular and equal, and is not affected by the jars and jolts of the machine. To each of these blocks is secured one or more metal pins, whereby the grain is well stirred and fed to the seed holes, and whereby the latter are also kept clear from obstructions.

**PLOW.**—William Cooley, Bunker Hill, Wis.—This invention relates to a plow of that class designed for plowing stony ground, and commonly termed "stubble plows." The invention consists in constructing the plow in such a manner that the line of draft will be central and direct, nearly parallel with the land side, so as to insure an easy draft, uniformity in the width of furrow, a complete turning under of stubble, straw, stalks, etc., and the avoidance of the clogging or choking up of the plow.

**NURSE STOVE.**—L. A. Plumb, Biddeford, Maine.—This invention relates to a portable lamp stove designed more especially for the nursery and for heating substances in a small way. The object of the invention is to obtain a device for the purpose specified by which the benefit of both the light and heat radiated from the lamp may be obtained, and have a more simple, convenient and desirable article for the nursery than those hitherto devised.

**SOWING MACHINE.**—James G. McGrew, Caledonia, Tenn.—The object of this invention is to construct a machine by which seeds particularly weak may be sown in drills among standing corn so that the corn may be left standing until the spring frosts are over, thereby protecting the young wheat plant from being injured by the winter and spring frosts.

**MACHINE FOR THINNING COTTON PLANTS.**—Charles A. McCaughan, Moscow, Tenn.—The object of this invention is to save hand labor, and expedite the work of thinning cotton plants growing in rows to the proper distances apart for hills, as usually cultivated on the plantations in the Southern States.

Answers to Correspondents.

**CORRESPONDENTS** who expect to receive answers to their letters, must, in all cases, sign their names. We have a right to know those to whom we seek information from us; besides, as sometimes happens, we may prefer to address the correspondent by mail.

**SPECIAL NOTE.**—This column is designed for the general interest and instruction of our readers, not for gratuitous replies to questions of a purely business or personal nature. We will publish such inquiries, however, when paid for as advertisements at 50 cents a line, under the head of "Business and Personal."

**J. K., of Ill.**—Burgh gives as a rule seventeen and a half square inches per horse-power on the piston, and one square inch per horse power area of port. Eight inches area is therefore too small to work sixty nominal horse-power in a cylinder of only fifteen and a half inches. In fact we do not know how that amount of power can be got from such a cylinder. Bourne says the same thing in general terms and gives the following rule to find the area of steam (inlet), or eduction (outlet) ports: Multiply the square of the diameter of the cylinder in inches by the speed of the piston in feet per minute and by the decimal .032 and divide the product by 140.

The quotient is the proper area of the port in square inches. The fact is that engineers err too often on the side of contracting the area of ports. With a proper consideration of the friction of the common slide valve, the more generous the area of ports the easier the engine works. There should be no cramping of the steam either on its inlet or outlet.

**Sundry Answers.**—**W. R.**—The English law does not require the working of the patent within any specified period.—**A. B.**—The electric light has been illustrated in back numbers of the SCIENTIFIC AMERICAN.—**G. W. L. Grand Rapid, Mich.**, without knowing the position of your piston with reference to your diagram, it is difficult to answer your question definitely. We think however that your trouble is in the position of your eccentric, in other words the setting of your valve.—**S. D. P.**—If you increase the steam pressure the quantity of steam being the same of course you get more heat. See table of pressure and degrees of heat in our book.—**E. W. D.**—In the same book you will find the rule for calculating horse power of steam engines.

**U. S., of Mo.**—Any salt water carried up by a waterspout or hurricane will on falling, bring all the salt with it. There is nothing in the sky to separate and keep up the salt. "All that goes up must come down, on your head or on the ground."

**C. E. J.**, will find the information he desires as to the speed of the electric current on page 19 of our work on patents.

**F. C. D., of Tenn.**—Put tartrate of lead in an iron or glass tube stoppered with clay and subject it to a low red heat for about an hour. The product is a phosphorus which never falls. The contents of the tube while heating must be kept excluded from the air while at the same time opportunity is given for the gases generated to escape.

**H. A. M., of N. Y.**—It is not easy to find a soap (oleate of soda) and glycerin which will answer well for the bubble experiments. We have had good success in this way: Dissolve castile soap in strong alcohol; let it settle or filter and take the clear solution from which evaporate the alcohol. The solid residue is oleate of soda. To this add half its weight of Price's glycerin and sufficient water to give the proper consistency. The beauty of the experiments if you succeed, will reward you for all your trouble.

**D. J. C., of Pa.**, wants a better draft for a furnace which warms a church. The church is 41x65, chimneys at the side, terminating at the eaves. The furnace in the basement 4 feet under ground level. The number and dimension of chimneys, used and where the furnace pipes enter them are not given. It is possible that the furnace has horizontal flues and that the gases of combustion have too great a space to traverse before reaching the outer atmosphere and thus become cooled and lose their ascensive power.

**G. D. M., of Me.**, asks how are the "water marks" in paper made? Paper is made by the deposition of the pulp in a thin layer on a sieve of fine wire. Any device may be woven into the net work and being above the general surface the sheet will be thinner there and transmit the light.

**C. C. E., of Wis.**—Crayons of all colors for carpenters' use may be obtained at almost any tool store. They will be found to be better than either chalk or charcoal.

**J. W., of Ill.**—The department in the SCIENTIFIC AMERICAN under the heading "Science Familiarly Illustrated" will from time to time contain among other information useful hints for mechanics' apprentices.

**J. W. P., of Ill.**—Something more than the diameter of your cylinder is necessary to be known to determine its horse-power capacity. The length of stroke, at least must be given to reach an approximation of the truth.

**A. R., of Wis.**—Common isinglass melted in water as ordinary glue, with a little alcohol added and applied hot is a good belt cement. We know of none better, although a mixture of shellac varnish and dissolved india-rubber is recommended by some.

**T. H. L., of Ohio.**—We cannot inform you how the Berlin iron workers produce such delicate castings. It is probably a secret. Castings are made so fine and small that it requires 10,000 to weigh one pound.

**J. K. G., of Wis.**—We consider a "right hand" horizontal engine to be one the shaft of which projects from the right hand side of the bed when the observer stands at the cylinder end facing the crank. The diagram you send is that of a right hand engine.

**W. D. R., of Pa.**—The substance you describe is probably a variety of clay. Correspondents who want our opinion of the nature or quality of mineral and other substances should inclose a sample whenever practicable. 10 grains of a mineral are better in such cases than pages of written description.

Business and Personal.

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

**C. C. Force, Hagerstown, Md.**, wishes to know how a cracked church bell can be restored to its original tone.

The Newark Manufacturers Agency, 85 Centre street, New York City, have for sale low one of Roper's Patent Hot-air Engines. They are very economical whereless than two horse-power is required. A ton of coal will run one nearly a month and keep the shop warm besides.

Pattern Letters for foundrymen, machinists, and others are made in the best styles by H. W. Knight and Brother, Seneca Falls, N. Y.

**T. M. Schleier, Nashville, Tenn.**, wishes to correspond with Rolling Mills on his patent "Indented Rail" for street cars.