

ASTRONOMICAL NOTES.

OBSERVATORY OF VASSAR COLLEGE.

For the computations (which are approximate only) and for the observations collected in the following notes, I am indebted to students. M. M.

Positions of Planets for November, 1873.

Mercury.

On the 1st, Mercury rises at 8h. 33m. A. M., and sets at 5h. 39m. On the 30th it rises at 7h. 2m. A. M., and sets at 4h. 38m.

Venus.

On the 1st Venus rises at 4h. 17m. A. M., and sets at 3h. 51m. P. M. On the 30th Venus rises at 5h. 27m. A. M., and sets at 3h. 26m. P. M.

Venus can best be seen at early morning at present, but a small telescope will show it in the daytime; it comes to meridian or south a little after 10 A. M. during the first half of the month, and before 10h. 30m. all through the month, its altitude in this latitude being about 45° on the first of the month, and 32° on the last of the month.

Mars.

Mars, which has been so favorably seen through the summer months, is at too low an altitude and sets too early in November to permit one to make good observations.

It rises on the 1st at 11h. 52m. A. M., and sets at 8h. 41m. P. M. On the 30th it rises at 49m. after noon, and sets at 8h. 39m.

Jupiter.

Jupiter is very unfavorably situated for observation at this time.

On the 1st of November it rises at 2h. 44m. in the morning, and sets a little after 3 in the afternoon. On the 30th it rises at 1h. 13m. in the morning, and sets at 1h. 24m. P. M. Its apparent diameter is increasing, and it reaches a greater altitude from day to day, when it comes to meridian. It is moving among the stars of *Leo*; is east of the star π *Leonis* on the 1st, and on nearly the same parallel of declination. On the 30th its diurnal course is very nearly in the celestial equator, its declination being only 1° 37' N.

Saturn.

Saturn, which during the summer months has been so beautiful, is becoming smaller, and is setting earlier.

It rises on the 1st of November at 0h. 32m. A. M., and sets at 9h. 50m. P. M. On the 30th it rises at 10h. 45m. A. M., and sets at 8h. 7m. P. M. It should be looked for early in the evening, in the southwest, among the stars of *Capricornus*. On the 30th it has nearly the same right ascension as the double star of *Capricornus* known as α^2 , which can be seen with the eye; and an imaginary line from this star, running below it some 9°, will reach Saturn.

Uranus.

On the 1st Uranus rises at near 11 P. M., and sets at 1h. 17m. A. M. On the 30th it rises at 9h. 3m. P. M., and sets at 11h. 23m. A. M. It is among the small stars of *Cancer*, and can be seen with a small telescope.

Neptune.

Neptune rises on November 1 at 4h. 25m. P. M., and sets at 5h. 27m. A. M. On the 30th Neptune rises at 2h. 29m. P. M. and sets at 3h. 33m. A. M. It cannot be seen without a good glass.

Spots on the Sun.

The record of sun spots by photography is from the 9th to the 13th inclusive, with the omission of Sunday, the 12th. On October 9th, one pair of small spots was near the western limb of the sun, another pair of larger, circular spots was between the eastern limb and the center, and an elongated spot was at a short distance from the eastern limb. On October 10th, besides a change of position, owing to the revolution of the sun on its axis, a fresh spot appeared, accompanying the elongated spot of the previous day. October 11th showed merely a change of position from the sun's revolution. On the 13th, the western pair had disappeared in consequence of the daily motion, the larger spot of the eastern pair had become circular, and, between it and the eastern limb, two small spots had appeared. Photographs of the 14th, 15th, 16th, and 17th show only daily change of position. On the 16th and 17th, the group nearest the western limb was surrounded by conspicuous faculae.

Amount of Rain.

The rains in October have been very heavy. The rain which fell between the morning of October 6 and the afternoon of October 7 amounted to 2.3 inches. The rain which fell between the evening of October 19 and the morning of October 21 amounted to 3 inches.

Death of Donati.

Professor Donati, the director of the Astronomical Observatory in Florence, died recently in Vienna, where he had just arrived to attend to duties connected with the exhibition. His name is connected with a comet discovered by him in June, 1868, which, during the following August, passed around the sun within the orbit of Venus, exhibiting a nucleus as bright as Arcturus, and a tail of great brilliancy and more than twenty degrees in length.

The Hayden Exploring Expedition—Remarkable Natural Curiosities.

The last Congress authorized the geological and topographical survey of Colorado Territory, under the direction of the Secretary of the Interior, by whom the active work was committed to the charge of Professor Hayden. James T. Gardner was the geographer of the expedition, and he gives a variety of interesting particulars concerning the location of the mountains. The district surveyed comprises

the grandest portion of the Rocky Mountains, where the highest peaks are found. The area surveyed was about 160 miles broad, and embraced Middle Park, South Park, and the Southern San Luis Park. The number of mountains surveyed and mapped is astonishing, large numbers of the peaks measuring from 13,000 to 14,500 feet in height. The triangulation extended over 30,000 square miles.

Professor Hayden reports some very interesting particulars in a letter to the *Evening Post*.

The explorers' experience on the Electric Mountains—a high and much exposed range separating San Luis Park from Wet Mountain valley—was most amusing. They could scarcely handle their instruments, sparks being elicited at every touch; their rifles, too, snapped under the electric influence, and were in continual danger of going off; while, when caught in a thunderstorm, their hair literally stood on end. The whole party experienced shocks more or less severe, but none were injured.

NATURAL SODA WATER SPRINGS.

These are at Colorado Springs, three days from Cañon City. The wide reputation of these springs is not undeserved, and the different ingredients with which the waters are charged, considering their close proximity, is quite remarkable. The waters of the main springs contain respectively iron, soda, and sulphur, together with other substances in minor quantities. The soda spring is particularly interesting, being heavily charged with carbonic acid gas, which bubbles up in a lively manner. Inverting your glass and plunging it quickly into the spring, you obtain a delicious draft far superior to any ordinary soda water. The water is led into bath houses, and is considered very efficacious in the relief of rheumatism. It is certainly most refreshing. The hotel accommodations are excellent and their situation very beautiful, built as they are in one of the main cañons leading up to the Rocky Mountains and entirely shut in by the foot hills. Pike's Peak rises grandly above all, forming the main feature in the scenery.

CURIOUS SAND HILLS.

One of the most wonderful sights of the exploration was encountered at the entrance of the pass. The wind sweeping down the valley is drawn towards the narrow gorge which furnishes the passage through the mountains, and has piled up a range of sand dunes seven hundred feet above the plain. They are several miles in extent, and, upon approach, glistening under the southern sun, resemble in their brilliancy mountains of pure snow; and the crossing was effected with even more difficulty than it would have been over a snowy range.

PLACES OF INTEREST.

The neighboring country contains many places of curious interest, such as "Monument Park" and the "Garden of the Gods." The former consists of a valley filled with pillars of hardened limestone, which have been left standing, the softer material having been eroded by the action of water and the atmosphere. As one looks upon these great monuments of Nature, he feels as if they might mark the resting place of the dread giants of the story books. The "Garden of the Gods" is of similar construction, only the remaining rocks are higher and more conical in shape, the material being a red sandstone; the pointed spires, upon approach, resemble a gothic cathedral.

PIKE'S PEAK.

A favorite expedition is the ascent of Pike's Peak, a feat that is now practicable even for ladies. A new trail has been constructed to the top, and a halfway house built to accommodate those who stay overnight, thus enabling them to reach the summit early in the day, when the atmosphere is clear and the view most extended. A signal station has been established on the summit by the War Department for the benefit of "Old Probabilities," forming an object of interest to those who reach the top.

RAILWAY RELIGION.—During the homeward journey of the western delegates to the recent Evangelical Alliance gathering in this city, a religious meeting was held on board of one of the trains, in a Pullman parlor car especially granted for the occasion. The returning delegates crowded the car, which was provided with an excellent organ, and had a splendid time of it; stringing out their prayers, hymns and exhortations for a distance of over sixty miles. Thus it is that science lends her aid to assist religionists. But it is ten to one that these divines will get up in their pulpits next Sunday and denounce scientific men as servants of the evil one, infidels and scoffers, because, having found out that the world was not formed in a week, they are bold enough to say so.

THERE is to be daily steamer service between New York and Liverpool, on the Cunard line. The company, we understand, are to withdraw their vessels from the West India trade and assign them to this duty. Eight new ships for this line are now in progress of construction at the yards of Messrs. J. & G. Thomson, on the Clyde.

Inventions Patented in England by Americans.

- (Compiled from the Commissioners of Patents' Journal.)
From September 30 to October 9, 1873, inclusive.
- CARBURETING AIR.—F. Cutting, Woburn, Mass.
 - CONNECTING HOSE.—N. Thompson (of Brooklyn, N. Y.), London, England.
 - CONNECTING HOSE.—N. Thompson (of Brooklyn, N. Y.), London, England.
 - FIRE ARM.—Providence Tool Company, R. I.
 - GUNPOWDER.—L. DuPont et al., Newcastle, Del.
 - KNIVES AND FORKS.—H. Bramhall (of New Britain, Conn.), Sheffield, Eng.
 - LAMP BURNER.—T. Silver (of New York city), London, England.
 - LAMP.—R. Hitchcock et al., Watertown, N. Y.
 - LIFE PRESERVER MATTRESS.—H. B. Mountain, New York city.
 - POWER PRESS.—N. C. Stiles, Middletown, Conn.
 - PRESSURE GAGE.—G. A. Everett (of New York city), London, England.
 - PUNCH.—I. P. Richards, Whitinsville, Mass.
 - STEAM LUBRICATOR.—W. Hamilton, Pa.
 - TREATING CAST IRON, ETC.—W. M. Arnold, New York city.

Recent American and Foreign Patents.

Improved Mode of Connecting Pitmen with Shafts.

Rudolph Cleaveland, Covington, Pa.—This invention consists in the mode of relatively constructing a bar and hand crank shaft, so that power other than that of the hand may be employed to operate. To the upper end of a vertical churn shaft is detachably attached bevel gearing communicating with a horizontal shaft. One end of the shaft projects, is flattened, and has a longitudinal slot formed in it. A crank is arranged so that the churn may be operated by hand power when desired, or a bar, in one end of which is formed a slot to receive the flattened end of the shaft, when it is secured in place by a spring catch pin. The other end of the bar is slotted to receive the end of the shaft of the driving power, where it is secured in place by a bolt and nut.

Improved Lamp.

Louis Berns, Middletown, N. Y.—This invention consists in the combination, with a loose drip cup, of the sections of a lamp column connected by intermediate rods, wide enough apart to allow the insertion and removal of drip cup.

Improved Harvester Rake.

James Irvine, Parkersburg, Iowa.—This invention furnishes an improved elevating rake for attachment to reapers and mowers to convert them into harvesters. As the shaft rotated by the driving wheel revolves, the rake will sweep across the lower part of the platform parallel, or nearly so, with the cutter bar, so as to collect the cut grain, and gather it into a gavel against the side board attached to the inner edge of the said platform. As the shaft continues to revolve, the rake slides the gavel back along the side board, a spring allowing the rake to accommodate itself to the size of the gavel. As the gavel approaches the rear inner corner of the platform, it is pushed into a trough attached to said corner. As the rake passes the end of the trough a guide pin enters a sharp angle in a guide groove, which swings the rake around, so that it may move forward along the outer part of the platform into proper position to collect another gavel. A small spring gate placed in the guide groove just in front of the sharp angle in said groove, which spring is pushed back by a pin and serves the double purpose of guiding said pin fully into the said sharp angle, and preventing it from leaving said angle by the route by which it entered it. The gavels are removed from the trough by binders standing upon the platform, and are laid to be bound upon the tables at the front and rear ends of the said platform.

Apparatus for Arranging Type for Type Setting Machine.

D. Brainerd Ray, New York city.—This invention consists of a new and improved apparatus for arranging type in rows for a type setting machine, and is designed to facilitate type setting by machinery. The construction and operation are as follows: A series of hoppers or troughs is arranged, one for each letter and character used in printing, upon a frame, at a convenient angle. Into these hoppers the type are distributed by hand, just as they are now, into the boxes of a type case. The type slide down to the channels or tubes, some having their notches turned one way, and some the opposite way; but the bottom and sides of said hoppers are so shaped that the type are all turned up edgewise as they enter the channels, and these are shaped so that they must pass through them on the edge or narrow side.

Improved Pruning Hook.

A. P. Bettersworth, Carlinville, Ill.—This invention relates to the class of pruning hooks in which a hook and sliding knife are so arranged that their cutting edges are made to approach each other by means of toggle or jointed levers, said effect being produced by a direct pulling or tractive force applied to the handle of the implement. The invention consists in the arrangement of double levers and a spiral spring in connection with a cutting hook and chisel adapted to slide on each other, said levers serving, by their extension, to operate the cutting devices, and the spring to retract and hold the same close together for renewing the operation.

Improved Steam Engine Governor.

Stephen P. Ruggles, Boston, Mass.—This invention consists of a pair of rotating registering disks side by side in the steam pipe, one of which is turned by clock work, or any power independent of the engine to be regulated, and the other is turned by the engine. The two are so connected that neither can advance or retrograde relatively to the other more than sufficient to close or open the register. The one turned by the clock geared to run as fast as the other should be driven by the engine, and they are so set relatively to each other that if an additional labor is imposed on the engine the retrograde motion of its disk will open the register and admit steam; or, if the labor is lessened the advance of the disk will close the register and shut off steam, and thus maintain the required uniform speed.

Improved Car Coupling.

Peter Kendrick, Trenton, N. J.—The object of this invention is improvement on the car coupling of Depeu and Hall, patented July 2, 1867, and Smith and Utton, patented September 13, 1871; and the invention consists in employing a headed bolt sliding in opposite slots of the drawhead and a link with a cross stud for strengthening it.

Improved Rice Cleaner.

David L. Geer, Lake City, Fla.—This invention consists, first, in the rotating shaft of the machine, with blades so arranged spirally, and turned in opposite directions, as to throw the grain upward and backward and forward; and, secondly, in providing the cylinder into which the grain is delivered with a bulge, which form a cavity wherein the grain is forced by the spiral blades, thereby effecting the hulling.

Improved Traveling Thrashing Power.

Richard W. Faris, Murfreesborough, Tenn.—This invention is intended to furnish an improved power for driving a thrasher, so that each shock of wheat or other grain may be thrashed while passing to the next shock thus saving much of the labor required in harvesting grain. The invention consists in the combination of the gear wheels connecting with the rear wheels of the wagon and communicating with a transverse shaft. Upon the shaft is placed a gear wheel about eighteen inches in diameter, and which is provided with a clutch upon each side, so that the shaft may be kept in motion when the wagon is turning, or even when one wheel is standing still. The upper part of the wheel projects through an opening in the bottom of the wagon box, and connects by a gear wheel to a short shaft which is attached to a band wheel, about twelve inches in diameter, and which is connected with the pulley of the thrasher engine. By this arrangement the thrasher cylinder will make about seventy-two revolutions to each revolution of the wheels. A still greater speed may be obtained by varying the size of the wheels, or by employing more wheels.

Improved Coffee Pot.

Margaret J. Stubbings, Youngstown, Ohio.—This invention consists in a cylindrical steam cover, connected, by pipes, with a perforated drum, and a muslin bag attached to it. The steam generated in the bottom part of the pot forces the boiling water continually over the coffee in the bag till the full strength of the same is extracted.

Improved Oil Can.

Orris H. Warren, Baldwinville, N. Y.—This invention consists mainly of a tubular rod, of suitable length, in which is an oil receiving chamber, and to which is secured a hollow handle, in which the air chamber is arranged. From the oil and air chambers the oil is forced out through the discharge pipe at the end of the rod by means of a pump arrangement operated by the thumb. Projecting lugs or ears, at the end of the discharge pipe, raise the covers of boxes or cups over bearings.

Improvement in Indexing Books.

John S. Hicks, Roslyn, N. Y.—This invention relates to the indexing of books, and consists of a volume provided with index tags bound into the back with its leaves, and projecting beyond the side edges thereof.

Improved Springs for Vehicles.

George W. Lewis, Portsmouth, Va., assignor to himself and C. W. Walker of same place.—This invention consists in two lever springs, the long sections of the upper division being held by the backwardly curved ends of sections of the lower portion. The two divisions are separated by a considerable space by the metal or wood block confined between them in a yoke, which also tends to utilize the power of the springs. The ribs are raised in the upper surface of each leaf, at the center, by indenting the under surface, which ribs are nested with the indentations.

Improved Atomizer or Vaporizer.

John N. Gerard, New York city.—A hollow collapsible bulb is made in cylindrical form, and attached to the top of a hollow bottle stopper by stretching the mouth of the bulb over the top into a groove. A pipe, rising up from near the bottom of the bottle through the bottom of the stopper, extends by a bend through the side of the stopper, and terminates in a small nozzle. The nozzle for the air projects from the side of the stopper, surrounds the small nozzle, and terminates slightly beyond the latter, with a contraction arranged to cause the air jet to converge upon the liquid jet at a point a little in advance of the two nozzles, so as to vaporize the liquid in the most effectual manner. There is passage from the hollow stopper into the bottle below, to admit the air for forcing out the liquid.

Improved Binder Attachment for Harvester.

Washington L. Sanford, Ashtab, Ill.—A hollow cylinder is made long enough to receive the longest grain, and large enough for receiving sufficient loose grain for a gavel in one part, and having another part in which to compress it. It is attached by a suitable supporting frame to the side of a reaper in such manner that the endless elevator thereof will deliver the grain into the opening near the top, where there is a shaft provided with curved teeth, to adapt it to clear the grain from the elevator, and press it downward and compress it in the receiver. At the bottom of the cylinder a shaft with teeth retains the falling grain in the side where it falls until a quantity sufficient for a gavel is obtained. There are also fingers to guide the grain as it falls from the elevator to the side where it accumulates. Guard wheels working in the grooved ends guide the grain into a space under the curves of these arms, for compressing it to be bound. While the gavel is accumulating, movable compressing arms are holding the one being bound, and after releasing it they are swung upward to the left, over to the right, downward on to the grain, and then up again to the left until arrested by the pressure of the grain brought up by them under the stationary arm. The extent of the compression of the gavel is regulated by springs and auxiliary compressing arms. Other arms cast the bound gavel down and out of the cylinder speedily, in order that the rake may the sooner revolve and save time for the binding. When the bundle is thus compressed the bands put round it and fastened by the attendant who stands on the platform. Suitable mechanism then throws the bundle clear of the machine.

Improved Ironing Table.

Walter B. Grosh and Simon H. Foreman, Reading, Pa.—The object of this invention is to furnish a table for ironing shirts, skirts, and other articles, and it consists in a folding table so constructed that the ironing board or leaf may be raised for putting on or taking off a shirt or skirt or other similar article, and the whole be made to fold together, so as to occupy but little space when not in use.

Fictile Compound for Sanitary and Decorative Articles.

Jesse Rust, Bond street, Vauxhall, England.—This invention relates to the compositions for sanitary, pictorial, decorative, and building purposes. Glass of any kind is ground to powder and mixed with the same weight of sand or ground flints. This mixture is then placed in a suitable furnace and fused. When cold the same is reduced to powder, is afterward pressed into molds in a dry or in a dampened state by adding water or any glutinous liquid. Another compound used is of equal parts of fused and of powdered glass and sand, mixed with two or more parts of clay or sand, cohered with liquid, molded, and baked. The blocks or molded pieces, small or large, are placed in a potter's or such like kiln, and baked in the same way as pottery ware. When cold they are fit to use, and form a material which may be polished, painted, glazed, or decorated like other fictile ware.

Improvement in the Preservation of Pulp Pigments, etc.

P. C. Tiemann, New York city.—This improvement relates to what are known in the trade as pulp, or slip, or paste colors or pigments, including whites, or that class of paint or coloring materials that is prepared for use by precipitation in water, or by fine grinding in water. The improvement in the preservation of the said pigments consists in treating the wooden vessel, in which the pigments are to be stored, with a material or filling that shall so close the pores of the vessel as to prevent any oozing away of the contents or loss of consistency in the pigments. This is accomplished by lining or covering the exterior of the vessel with a suitable insoluble paint or varnish, such as paraffin, shellac, wax, or ordinary oil paint or other insoluble material.

Improved Tool for Making Button Molds.

John T. Hawkins, Salisbury, Vt.—This invention consists of a chuck, with a conical cavity in the end, terminating in a cylindrical socket. There is a roughing tool in the conical cavity, and a finishing tool in the cylindrical socket, and also a center bit. All are so arranged that a square stick, being presented to the conical cavity and the roughing knife, will be turned down smooth and to the size of the required button mold, and then turned off upon the end by the finishing cutter to the required oval form for the top of the button mold. The stick, lastly, is presented to a saw and the mold cut off.

Improved Adjustable Tongue for Organ Reeds.

Maria Procopé, Stockholm, Sweden.—This invention consists in an improvement in tuning windreed instruments. A finger-shaped support is applied against the underside of the tongue to support the same near its root, and is attached to a slide which is held between guides that are fastened to under side of the board to which such tongue is secured. The slides are made with teeth at their sides, and a tuning key, having a pinion fastened to its lower end, is used for their adjustment. Whenever it is desired to tune the organ, it is only necessary to introduce the tuning key in one of as many openings as there are tongues in the board, and thereby to bring its pinion in gear with the plate to be moved, or with several plates successively. In this manner, therefore, the vibrations can be regulated by shifting the support and reducing or increasing the vibrating lengths of the several tongues. Instead of using an adjustable finger above or below the tongue to be tuned, the tongue itself may be made movable, and the length of its vibrating portion thereby increased or reduced.

Improved Fire Escape.

Peter W. Barnes, Albany, N. Y.—There is a box, one part of the top of which is stationary. To this is hinged a movable part, to the outer edge of which is hinged a plate which can be turned out of the window to rest upon the window sill. Another plate may be turned out to extend along the wall of building upon the outer side of the window blind. In the outer part of the latter plate is formed a hole where the ladder is dropped. This ladder is made of wire rope, and, when not in use, is kept in the box. Railings are hinged to the plates so that they may be turned up into a vertical position as a guard to those using the escape, and turned down into a horizontal position when said plates are to be folded together. Arms provided with springs are arranged to rest against the inner side of the window casing to hold the device steady and prevent it from being drawn out of the window. These are locked, when extended, by stops, and, when closed, are held in position by catches, so that they may be released by opening the device.

Improved Machine for Driving Brush Handles.

John Ames, Jr., Lansingburgh, N. Y.—To the table is attached a frame in which a plate slides up and down in grooves. To the rear side of the plate is attached a rack which connects with a pinion on a shaft by which said plate is raised or lowered. A hand screw limits the downward movement of the plate and insures that the handles of the brushes are driven to exactly the same point. To the forward side of the plate is secured the follower, by which the handle is forced into the brush. Two blocks have half round notches to receive and hold the handle while being driven, and are so arranged in connection with arms as to be kept horizontal while moving toward and from each other. Said blocks, by suitable means, are kept exactly in line with each other as they move out and in, and may be moved back out the way to enable the brush to be conveniently removed from the machine. In operation, the point of the brush handle is passed down through the hole between the blocks, and is inserted in the center of the brush head, the lower end of the driver resting upon the upper end of the brush handle. A lever is then operated, forcing the brush handle down through the brush head until the forward end of a set screw strikes the top board of the frame. As the forward end of the brush handle passes down through the brush head, its point or forward end enters a socket in a guide which keeps

it centered. The brush handle is thus always supported at two points, and kept accurately centered. When the brush handle has been fully driven, the driver is raised from between the blocks, the blocks and arms are pushed back out of the way, and the brush is removed.

Improved Bee Hive.

Charles J. Sperry and Lyman Chandler, New London, Minn.—This is a double bee hive with two sets of honey frames. The roof is made in two parts hinged together at the center, and fits over the hive. The honey frames are suspended from cleats by means of projecting top pieces. The bottom of the hive consists of two inclines corresponding in form with the roof, the edges of which form the bee lighting boards. A slat partition extends from a cross piece to the center ridge of the floor, and a shutter closes the communication between the two parts of the hive. When the shutter is reversed, the bees can pass freely from one part to another. This is a great convenience in dividing swarms. Outside of honey frame of each part of the hive there is a compartment closed by means of the movable partition and a top slat. The partition is hinged so that, when the loose slat is removed, the top of the partition will drop over against the side, which allows the honey frames to be removed without difficulty. The bee entrances through the top bars of the honey frames are of peculiar construction, and are formed by cutting out the top part and inclined under sides of the bar, leaving the bottom part entire, the object being to avoid weakening the bar and to form passages for the bees, through which they may pass up or down on either side of the comb or comb frame.

Improved Combined Shutter Worker and Blind Operator.

Daniel M. Leonard, La Crosse, Wis.—The object of this invention is to provide mechanism for operating, adjusting, and locking the window shutters and blind slats from the inside of the window. A cog wheel is keyed on a sliding shaft to be brought into engagement, alternately, with a toothed disk attached to the shutter, and toothed segmental lever connected with the blind slats, whereby both the shutter and slats may be adjusted as desired.

Improved Potato Cutter and Planter.

Lemuel G. Mewborn, Kinston, N. C.—This invention relates to a potato cutter and dropper on wheels, and consists in combining mechanical instruments so that whole potatoes are fed to a hopper, cut up into an average size, and dropped at regular intervals in the drill or hill. It seems to meet a want long experienced by farmers, who find hand-cutting and hand-cropping of potatoes a very tedious, a very laborious, and a very expensive undertaking.

Improved Locomotive Smoke Stack.

James Hughes, Scranton, Pa.—The object of this invention is to provide the smoke stack of locomotives with an improved cone by which the draft is increased and the rapid wearing out of parts of the stack by the exhaust steam prevented. This invention consists of flat plates and rings of varying sizes, which are placed above each other in such a manner that the steam cannot pass through without striking the plates and rings, varying thereby the direction of the steam and distributing it equally so that it will pass out from the stack without impinging on the sides of the same and bringing the bonnet into use over its whole surface. The draft is regulated by making the top plate and ring adjustable on the central standard.

Improved Trotting Gear.

Henry Schmalhausen, Bridgeport, Ill.—The object of this invention is to provide an elastic gear for horses, by which they can trot faster, raise their feet higher, and step higher, preventing them also from balking, kicking, backing, or rearing. It consists of an elastic strap, which plays easily through the hame ring, either end being fastened to a hind and fore foot.

Improved Ore Washer.

Ira T. Halstead, Fredonia, N. Y.—This invention furnishes a simple apparatus for collecting sulphurets, gold, silver, etc., from ores. The invention consists in the employment of one or more sieves, in connection with one or more sluices and pivoted boards, for separating the sulphurets and heavier particles of ore from the stream of water and pulverized ore passing through the apparatus.

Improved Neck Yoke Holder.

George R. Huntley, Hubbardston, Mich., assignor to himself and Carlos E. Halt, of same place.—This invention consists in constructing the holder of a flexible sheet metal plate, which laps around the yoke and is secured to the perforated leather plate by rivets. Thus the plates lap around the yoke, and, being flexible and formed in one piece, they form a strong device for the purpose.

Improved Lubricator.

William A. Pratt, Baltimore, Md.—This invention consists in using on the inside of a reservoir a slide sleeve, to adjust the upper of the two valves of a locomotive lubricator toward or from its seat, to regulate the flow of oil into the feeding channel that leads to the parts to be lubricated.

Value of Patents, AND HOW TO OBTAIN THEM. Practical Hints to Inventors.

PROBABLY no investment of a small sum of money brings a greater return than the expense incurred in obtaining a patent even when the invention is but a small one. Larger inventions are found to pay correspondingly well. The names of Blanchard Morse, Bigelow, Colt, Ericsson, Howe, McCormick, Hoe, and others, who have amassed immense fortunes from their inventions, are well known. And there are thousands of others who have realized large sums from their patents.

More than FIFTY THOUSAND inventions have availed themselves of the services of MUNN & Co. during the TWENTY-SIX years they have acted as solicitors and Publishers of the SCIENTIFIC AMERICAN. They stand at the head in this class of business; and their large corps of assistants, mostly selected from the ranks of the Patent Office: men capable of rendering the best service to the inventor, from the experience practically obtained while examiners in the Patent Office: enables MUNN & Co. to do everything appertaining to patents BETTER and CHEAPER than any other reliable agency.

HOW TO OBTAIN Patents

This is 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, Drawing, 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 as good a 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.

Rejected Cases.

Rejected cases, or defective papers, remodeled for parties who have made applications for themselves, or through other agents. Terms moderate. Address MUNN & Co., stating particulars.

To Make an Application for a Patent.

The applicant for a patent should furnish a model of his invention if susceptible of one, although sometimes it may be dispensed with; or, if the invention be a chemical production, he must furnish samples of the ingredients of which his composition consists. These should be securely packed the inventor's name marked on them, and sent by express, prepaid. Small models, from a distance, can often be sent cheaper by mail. The safest way to remit money is by a draft, or postal order, on New York, payable to the order of MUNN & Co. Persons who live in remote parts of the country can usually purchase drafts from their merchants on their New York correspondents.

Caveats.

Persons desiring to file a caveat can have the papers prepared in the shortest time, by sending a sketch and description of the invention. The Government fee for a caveat is \$10. A pamphlet of advice regarding applications for patents and caveats is furnished gratis, on application by mail. Address MUNN & Co., 37 Park Row, New York.

Reissues.

A reissue is granted to the original patentee, his heirs, or the assignees of the entire interest, when, by reason of an insufficient or defective specification, the original patent is invalid, provided the error has arisen from inadvertence, accident, or mistake, without any fraudulent or deceptive intention.

A patentee may, at his option, have in his reissue a separate patent for each distinct part of the invention comprehended in his original application by paying the required fee in each case, and complying with the other requirements of the law, as in original applications. Address MUNN & Co., 37 Park Row, for full particulars.

Design Patents.

Foreign designers and manufacturers, who send goods to this country may secure patents here upon their new patterns, and thus prevent others from fabricating or selling the same goods in this market.

A patent for a design may be granted to any person, whether citizen or alien, for any new and original design for a manufacture, bust, statue, alto relievo, or bas relief; any new and original design for the printing of woollen, silk, cotton, or other fabrics; any new and original impression, ornament, pattern, print, or picture, to be printed, painted, cast, or otherwise placed on or worked into any article of manufacture.

Design patents are equally as important to citizens as to foreigners. For full particulars send for pamphlet to MUNN & Co., 37 Park Row, New York.

Foreign Patents.

The population of Great Britain is 31,000,000; of France, 37,000,000; Belgium, 5,000,000; Austria, 36,000,000; Prussia, 40,000,000; and Russia, 70,000,000. Patents may be secured by American citizens in all of these countries. Now is the time, while business is still at home, to take advantage of these immense foreign fields. Mechanical improvements of all kinds are always in demand in Europe. There will never be a better time than the present to take patents abroad. We have reliable business connections with the principal capitals of Europe. A large share of all the patents secured in foreign countries by Americans are obtained through our Agency. Address MUNN & Co., 37 Park Row, New York. Circulars with full information on foreign patents, furnished free.

Value of Extended Patents.

Did patentees realize the fact that their inventions are likely to be more productive of profit during the seven years of extension than the first full term for which their patents were granted, we think more would avail themselves of the extension privilege. Patents granted prior to 1861 may be extended for seven years, for the benefit of the inventor, or of his heirs in case of the decease of the former, by due application to the Patent Office, ninety days before the termination of the patent. The extended time inures to the benefit of the inventor, the assignees under the first term having no rights under the extension, except by special agreement. The Government fee for an extension is \$100, and it is necessary that good professional service be obtained to conduct the business before the Patent Office. Full information as to extensions may be had by addressing MUNN & Co., 37 Park Row.

Trademarks.

Any person or firm domiciled in the United States, or any firm or corporation residing in any foreign country where similar privileges are extended to citizens of the United States, may register their designs and obtain protection. This is very important to manufacturers in this country, and equally so to foreigners. For full particulars address MUNN & Co., 37 Park Row New York.

Canadian Patents.

On the first of September, 1872, the new patent law of Canada went into force, and patents are now granted to citizens of the United States on the same favorable terms as to citizens of the Dominion.

In order to apply for a patent in Canada, the applicant must furnish a model, specification and duplicate drawings, substantially the same as in applying for an American patent.

The patent may be taken out either for five years (government fee \$20) or for ten years (government fee \$40) or for fifteen years (government fee \$60). The five and ten year patents may be extended to the term of fifteen years. The formalities for extension are simple and not expensive.

American inventions, even if already patented in this country, can be patented in Canada provided the American patent is not more than one year old.

All persons who desire to take out patents in Canada are requested to communicate with MUNN & Co., 37 Park Row, N. Y., who will give prompt attention to the business and furnish full instruction.

Copies of Patents.

Persons desiring any patent issued from 1836 to November 26, 1867, can be supplied with official copies at a reasonable cost, the price depending upon the extent of drawings and length of specification.

Any patent issued since November 27, 1867, at which time the Patent Office commenced printing the drawings and specifications, may be had by remitting to this office \$1.

A copy of the claims of any patent issued since 1836 will be furnished for \$1.

When ordering copies, please remit for the same as above, and state name of patentee, title of invention, and date of patent. Address MUNN & Co., Patent Solicitors, 37 Park Row, New York city.

MUNN & Co. will be happy to see inventors in person, at their office, or to advise them by letter. In all cases, they may expect an honest opinion. For such consultations, opinions and advice, no charge is made. Write plainly do not use pencil, nor pale ink; be brief.

All business committed to our care, and all consultations, are kept secret and strictly confidential.

In all matters pertaining to patents, such as conducting interferences procuring extensions, drawing assignments, examinations into the validity of patents, etc., special care and attention is given. For information, and for pamphlets of instruction and advice

Address
MUNN & CO.,
PUBLISHERS SCIENTIFIC AMERICAN,
37 Park Row, New York.
OFFICE IN WASHINGTON—Corner F and 7th streets, opposite Patent Office.