

Armed with this new idea, he set to work with renewed cheerfulness, and invented a beautiful machine, which enabled him to comb cheap cotton into moderately fine yarn.

In 1720, a potter named Astbury was journeying on horseback from Staffordshire to London. Stopping awhile at Dunstable, he obtained assistance in regard to a weakness in the eyes of his horse. The hostler at the inn, making use of such bits of veterinary knowledge as he possessed, took a piece of flint, calcined it in the fire, pulverized it, and blew some of the powder into the horse's eyes. The change produced in the flint, by burning from a black stone to a white powder, struck Astbury with a new idea. Would it be possible to produce white flint ware, harder and more durable than white ware made wholly of clay? He collected a small stock of flints from the chalk hills of Dunstable, and took them back with him to Staffordshire. The result more than realized his expectations; powder of calcined flint, mixed with pipe clay, produced a most excellent ware, and established a new branch of the potter's art that took firm root in Staffordshire.

#### Railway from Boston to the Summit of Mount Washington.

It is expected that the extension of the branch of the Boston, Concord, and Montreal Railroad, from the Fabian House to the base of Mount Washington, a distance of about seven miles, there connecting directly with the Mount Washington Railway, extending to the summit, will be completed and opened for public travel by the first of July, at which time passengers by this line from Boston can reach the base of Mount Washington without change of cars, and thence, by direct transfer to the cars of the Mount Washington Railway, reach the summit, making the entire distance by steam power. Passengers will thus be enabled to take their breakfast at Boston and their supper on the summit of Mount Washington at the usual hours of the same day, and without fatigue or the annoyance of change.

#### The Fast Train Across the Continent.

This remarkable enterprise ended triumphantly on Sunday, June 4, the train reaching San Francisco at 9:23 A. M. The total time from Jersey City to San Francisco was 83 hours 34 minutes, being 4 hours 26 minutes less than the schedule time, 88 hours. At 9:52, on June 4, the passengers alighted in the court of the Palace hotel, dusty and travel-worn, but in good health and spirits. Engine No. 49 brought the train through from Ogden, with the assistance of an additional engine in crossing the Sierras. The time from Ogden to San Francisco was 23 hours and 52 minutes. The actual average running time from Ogden to Oakland wharf was 41½ miles per hour. Considerable trouble was experienced on the Central Pacific from the wearing out of the brake shoes on the Pennsylvania cars; and in the mountains the Central Pacific Company put on two of their own coaches to brake the train. There was no accident of any kind throughout the trip. Shortly after arrival breakfast was served, to which prominent citizens, army and navy officers, representatives of the press and the theatrical profession, railroad officials, and the Mayor of the city were invited.

A salute of thirteen guns was fired from the roof of the Palace hotel on the arrival of the train at the wharf. The remainder of the day was devoted to needed rest. The excursionists were serenaded in the evening.

#### Inventions Patented in England by Americans.

(Compiled from the Commissioners of Patents' Journal.)  
From April 25 to May 22, 1876, inclusive.

ARTIFICIAL STONE.—W. H. Smith, Philadelphia, Pa.  
ATOMIZER.—T. J. Holmes, Boston, Mass.  
AXLE.—G. W. Miltmore, Jamesville, Wis.  
BLIND ROLLER.—S. Hartshorn, New York city.  
BOILER FLUE CLEANER.—A. Wiggan, Rye, N. Y.  
BOOKBINDING.—A. Hoyt, Brooklyn, N. Y., et al.  
BOTTLE STOPPER, ETC.—N. Thompson (of Brooklyn, N. Y.), London, Eng.  
BRICK MACHINE.—W. L. Grigg, Chicago, Ill.  
CAR FARE INDICATOR.—M. Runkel, Golden Square, London, England.  
CALENDAR, ETC.—M. H. Paddock, East Clarkson, N. Y.  
CAPSTAN.—J. H. David, Damaris-Cotta, Me.  
CASTOR.—L. P. Lawrence, Port Morris, N. J.  
CHARGING GAS RETORTS.—J. F. Rice, Louisiana, Mo.  
CLEANING SHIPS' BOTTOMS.—J. C. Seymour, New York city.  
COFFEE POT.—G. W. Hubbard, Windsor, Vt.  
CONDENSING EXHAUST STEAM.—J. F. Fitch, Brooklyn, N. Y.  
CUTTING MEAT, ETC.—W. H. Goodchild, New York city, et al.  
ELECTRO-MAGNETIC ENGINE.—L. Bastet, New York city.  
EXTRACTING JUICES.—L. F. G. Bouscaren, Cincinnati, O.  
FOLDING TENT, ETC.—F. A. Guthrie, Addison, O.  
FORK, ETC.—Brown Brothers Co., Waterbury, Conn.  
FOUNTAIN LAMP.—R. H. Webb, Brooklyn, N. Y.  
GAFF FASTENING.—J. H. David, Damaris-Cotta, Me.  
GAS EXTINGUISHER.—V. N. Taylor et al., Springfield, Mass.  
GLOVE FASTENING, ETC.—F. G. Farnham, Hanley, Pa.  
HAND STAMP.—G. C. Cooke, New York city.  
HARVESTING MACHINE.—S. Johnston, Brockport, N. Y.  
HYDRAULIC DREDGE, ETC.—W. H. Newton, Chicago, Ill.  
IRONING MACHINE.—T. S. Wiles et al., Albany, N. Y.  
KITCHEN SAFE.—G. W. Bollenbacher, Bloomington, Ind.  
KNITTING MACHINE, ETC.—C. J. Appleton, Elizabeth, N. J.  
MAKING PAPER PULP.—J. W. Dixon, West Manayunk, Pa.  
MAKING TEA, ETC.—J. Miller, Himrod's, N. Y.  
PAPER-CUTTING MACHINE.—J. Vanhorn et al., Brooklyn, N. Y.  
PIN.—H. M. Jenkins et al., New York city.  
PISTON PACKING, ETC.—J. T. Wright et al., Dayton, Ohio.  
PREVENTING FALLS IN SKATING.—J. T. Parlour (of N. Y.), London, Eng.  
PRINTER'S GALLEY.—J. F. Hannan, New York city.  
PROJECTILE.—N. Ward, Washington, D. C.  
PROPELLER.—F. H. B. Babbe, Antioch, Cal.  
RAILWAY, ETC.—R. Stone, Vandalla, N. Y.  
RAILWAY SWITCH AND SIGNAL.—D. Rousseau et al., New York city.  
SACK-SEWING MACHINE.—J. S. Hall, Monterey, Cal.  
SASH FASTENER.—N. Thompson (of Brooklyn, N. Y.), London, England.  
SASH FASTENER.—W. A. Hopkins, New York city.  
SCREW, ETC.—C. D. Rogers, Providence, R. I.  
SCREW, ETC.—E. A. Leland, New York city.  
SELF-CLOSING VALVE.—E. W. Lippert, Cincinnati, O., et al.

SIGNAL BUOY.—J. M. Courtenay, Cornwall, N. Y.  
SOLVING PROBLEMS.—T. Hill, Portland, Me.  
STARCHING FABRICS.—T. S. Wiles et al., Albany, N. Y.  
STEAM COOKING VESSEL.—S. T. Goodwyn, New Orleans, La.  
STEAM ENGINE.—G. McNaughten, Brooklyn, N. Y.  
STEAM HAMMER.—P. B. Williams et al., Quincy, Ill.  
STEERING PROPELLER.—F. G. Fowler, Bridgeport, Conn.  
TELEGRAPHING SOUND.—E. Gray, Chicago, Ill.  
THREADING SCREWS, ETC.—C. D. Rogers, Providence, R. I.  
TREATING OIL REFUSE.—W. P. Jenney, New York city.  
TRIMMING CARDS.—V. E. Mauger, New York city.  
TWISTING MACHINERY, ETC.—C. Fletcher et al., Providence, R. I.  
UMBRELLA, ETC.—H. Palmieri, New York city.  
WHEEL HARROW, ETC.—S. H. Weston, Winooski, Vt.

#### Recent American and Foreign Patents.

##### NEW MECHANICAL AND ENGINEERING INVENTIONS.

###### IMPROVED VALVE-GRINDING MACHINE.

William T. De Luce, Chicago, Ill.—This is an improved device for holding a valve upon its center while grinding it in its seat, which shall be so constructed as to enable the valve to be ground without detaching it from the pipe.

###### IMPROVED RAILROAD SWITCH CHAIR.

Henry C. Fox and Joseph Hayward, St. Joseph, Mo.—This consists of the base and web supports of the rails, extended up to and so fitted under the overhanging sides of the rail head that they are supported against splitting off and hammering down.

###### IMPROVED WATER MOTOR.

Israel F. Good, Goodsville, assignor to himself and Hiram F. Seiger, Orefield, Pa.—This invention consists of a series of buckets attached to a corresponding series of arms, some of which are made to rise with their buckets empty to an elevated tank by the weight of other descending filled buckets. The empty buckets are filled at the tank, and, in turn, raise the others, the excess of the weight of the filled buckets being applied to the performance of work.

###### IMPROVED DEVICE FOR STARTING PENDULUM CLOCKS.

Ernest A. Lourdelet, Paris, France.—This consists in the application of an additional axis in any convenient position in the clock dial or its pedestal, which axis is squared at the end to receive a key or its equivalent. It also carries a lever arm whose extremity is made by partly rotating the axis to bear against the pendulum rod and set the latter oscillating.

###### IMPROVED LEATHER-PUNCHING MACHINE.

Alonzo C. Rieke and Martin D. Norris, Eldora, Iowa.—This is a contrivance or device for punching leather straps of all kinds, but more particularly bars for leather fly nets for horses. It is adapted for punching either by movable or stationary punches, and has a feed mechanism worked by a shaft fixed transversely under the bed, to be turned by hand or other means.

###### IMPROVED STRAIN EQUALIZER FOR PULLEY ROPES.

Samuel Woolston, Vincentown, N. J.—This is a device for equalizing the strain upon the ropes of a number of sets of pulleys used together for moving heavy masses. It is so constructed as to enable all the ropes, or one or more of them, to be operated at a time without affecting the equalization of the strain among all of said ropes.

###### IMPROVED PIPE TONGS.

George M. Curry, St. Petersburg, Pa.—Upon the forward end of the handle is formed a crosshead in which is formed a groove to receive a tenon formed on a curved and pivoted bar. The other end of the crosshead is concave, and upon it is formed a tenon to enter a groove in the convex side of a pivoted semi-cylindrical jaw. Another jaw is similarly arranged on the inner side of the outer end of the hook first mentioned. The jaws have thus sufficient play to adjust themselves to the object to be grasped.

###### IMPROVED RELIEF APPARATUS FOR AIR COMPRESSORS.

William F. Tallman, Mineville, N. Y.—This consists of a weighted valve, in connection with the cylinder of an air compressor, to be raised by the air when the pressure exceeds a certain limit. There is a piston to which the air is admitted by said valve, and raised so as to stop the action of the receiving valves of the compressor, with which it is connected for that purpose. It thus prevents the increase of the pressure unduly. The weighted valve falls when the pressure of air diminishes and opens an escape for the air from the piston, which then falls and allows the valves of the compressor to act again. The relief apparatus may be made to work special valves on the compressor instead of the receiving valves.

###### IMPROVED PAINTER'S WHEEL HORSE.

Albert D. Osgood, Oneida, Ill.—This is an improved horse for painting the wheels of vehicles of all kinds without necessitating the removing of the wheels. It admits the adjusting of the wheel into any position, takes up little room, and facilitates the work. It consists of a base support or stand, with revolving upper part, and an adjustable hub, supporting top arm, and thimble.

###### IMPROVED ELEVATOR.

Alfred B. Darling, New York city.—The first part of this invention is a contrivance whereby ropes may be used instead of chains for gearing the elevator carriage with the retarder, which is employed to regulate the descent of the carriage. The ropes are claimed to be stronger, less noisy, and more easy in operation, and less wearing. The second part consists of the carriage connected to the hoisting drum by ropes, which wind off and on reversely to the accommodation of the hoisting ropes. The object is, first, to prevent the hoisting ropes from winding off faster than the carriage descends; and, second, to insure the descent of the carriage.

###### IMPROVED GANG PLANK.

George Malone, Memphis, Tenn.—This is a ladder of ropes and cross pieces, in combination with the stage plank of a steamer, in such manner that it can readily be removed for sliding freight on and off the boat, and is readily applied again to afford foothold for passengers. The said ladder is also applicable for a fire escape.

###### IMPROVED ADDING MACHINE.

David Carroll, Spring Creek, Pa.—The essential feature of this arrangement is a contrivance of a key for each of the figures of the nine digits, arranged for two to be worked by each finger of the left hand, and one by the thumb. Each key turns the unit wheel the number of figures that it stands for.

###### IMPROVED CHUCK FOR HOLDING METAL DRILLS.

William Frost, New Bedford, Mass.—This consists of a sliding jaw having a triangular notch and a couple of toothed jaws fixed to slide at right angles, and arranged in said notch. These are toothed, so that one meshes in the other, and have a spring between them, for opening them. All are arranged in a stock which is attached to the mandrel, and is so contrived that round, square, or other shapes, either taper or straight, may be held with like facility.

###### IMPROVED BLACKSMITH'S FORGING HAMMER.

John Koplin, Reed's Landing, Minn.—This is a new arrangement of apparatus whereby a sledge hammer is worked by a foot lever and springs.

###### IMPROVED WATCHMAKER'S LATHE.

Daniel M. Williams, Calvert, Tex.—This invention consists of a novel contrivance of a bed adjustable for varying the height of the bed relatively to the centers for different kinds of work; also of an adjusting tail stock, and an attachment for cutting gear wheels and pinions, all of which will be found illustrated on page 194, current volume.

###### IMPROVED PLAITING MACHINE.

Andrew J. Decker, Fond du Lac, Wis.—This consists of a series of removable needles in a couple of side pieces fixed in a base plate and perforated with numerous holes in a row, in which the needles can be readily put and removed. A clamping plate at one end of the apparatus is adapted for holding the cloth. The cloth is doubled around two or three or more of the wires for plaiting it, and the plaits are fastened by stretching it along the edges after being plaited. The wires are drawn out to release the plaits when completed.

###### IMPROVED PUMPING APPARATUS.

Wade Couts, Brownville, Neb.—This is a pumping apparatus so constructed that cattle may be made to water themselves. As the cattle step upon a treadle platform, their weight draws down a rope which, by suitable counterpoises, causes the pump to be operated.

###### IMPROVED LIFTING JACK.

John Y. Thurston, Medfield, Mass.—This consists of a sliding ratchet bar operated by a spring-bolt lever, and retained by a safety spring pawl.

###### IMPROVED SPARK ARRESTER.

Waldo H. Jordan, New York city.—This is an uninclosed conical annular cap, to cover both the mouth of the chimney and the mouth of the cinder receptacle which is made around the chimney. The interior is provided with a parabolic deflecting surface that begins at the center of the shell, curves upward and outward, then downward to the outer edge of the shell. When the products of combustion rise, they impinge upon said deflecting surface, which serves to turn the solid particles, sending them down into the receptacle which surrounds the chimney, while the smoke and gases pass laterally from the interior to the atmosphere.

###### IMPROVED PORTABLE SPRING POWER HAMMER.

Ray F. Livermore, Port Henry, N. Y.—This is a contrivance of a lever catch and tripping device, in combination with a hammer having a spring or springs for striking a powerful blow. The hammer may be easily handled by one man, and made to strike a powerful blow. It is designed for breaking large boulders of rock ores, iron, etc.

###### IMPROVED LIFTING JACK.

George G. Howe, Faribault, Minn.—This consists of legs pivoted to a top support, to which a lifting lever is fulcrumed. A ratchet and guard of the lever serves, in connection with a pivoted locking brace link of the outer leg, to retain the lever in hoisted position.

###### IMPROVED CAR COUPLING.

Jabez B. Meadley, Davenport, Iowa.—This is a contrivance of spring jaws for opening and receiving the link and securing it self-actingly, together with a cam, chain, and crank, whereby the jaws can be opened from the top or side of the car.

###### IMPROVED HYDRANT.

John T. Davis, Washington, D. C.—This invention relates to an improvement in the construction of the casing of the hydrant and the construction of the valve mechanism with the plug of the service pipe, also to the provision of a stopcock within the casing, whereby the water may be conveniently shut off at the hydrant itself, and the valve mechanism readily removed, for repair or other purpose, and whereby other operations incident to keeping a hydrant in proper condition may be effected without the necessity of digging up the casing.

###### IMPROVED ROTARY ENGINE.

Joseph Moore, Mound Valley, Kansas.—This consists of a pair of cylinders, with pistons set opposite each other for one to take steam when the other is not taking it. Abutments slide out and in to let the pistons pass, and are worked by cam disks outside of the cylinders. Two sets of slide valves are provided, for running the engine either way, the valves being worked by eccentrics on the shaft, outside of the case. There are two sets of exhaust ports for use according to the way the engine runs, the valves of which are connected to the reversing valves, so as to shift simultaneously with them. The steamways are constructed in the form of a ring, and the pistons are in the form of a segment of a ring, and are attached to the edge of a disk keyed on the shaft, so as to be fitted with ordinary round piston packing.

#### NEW CHEMICAL AND MISCELLANEOUS INVENTIONS.

###### IMPROVED MAIL BAG.

John Boyle, New York city.—The object here is to construct the mail bags that are taken up by the catchers of mail cars in such a manner that they may be more easily and securely taken hold of by the catches without danger of being dropped. The invention consists of a mail bag made with a narrower and contracted throat at the middle part, and provided with a detachable protecting sleeve.

###### DEVICE FOR REMOVING WIRES FROM BOTTLE CORKS.

John Franz, Croton Falls, N. Y.—A crocheted brace arranged in a handle is placed around one side of the neck of the bottle and under the wires. A forked claw engages the wire at the top of the cork and pulls it off by pressing the handle down.

###### IMPROVED DENTAL PLUGGER.

Cassius M. Richmond and Alexander Warner, Jr., San Francisco, Cal.—The mallet is mounted by a spring on the upper end of a tubular stock adapted for receiving different tools. A cam mounted on a revolving shaft, arranged parallel to the stock, lifts the mallet, and the spring throws it back against the head of the tool to strike the blow. The frame in which the cam shaft runs is mounted on the tool stock, so that the latter has a little endwise motion in the frame for allowing the tool to reciprocate, and a spring in the stock, beneath the head of the latter and the frame, raises the tool after being forced down by the hammer. A joint in the frame of the cam shaft allows the cam to be adjusted so as to strike light or heavy blows, as required.

###### IMPROVED COMBINED GAS AND CHANDELIER.

George P. Clark, Newton, Mass.—This is a contrivance of oil burners, in the center portion of a gas chandelier. It will be found fully described and illustrated on page 371 of our current volume.

###### IMPROVED TWEER.

Thomas F. Witherbee, Port Henry, N. Y.—This consists of a partition in the water chamber between the inlet and outlet pipes, to compel the water for cooling the tweer to pass entirely around it.

###### IMPROVED SHOE.

John C. Weil, Baltimore, Md.—This consists of a secondary insole, held in position by tags of muslin secured between the outsole and insole, and pasted down. The idea is to make the shoe easier to wear and less heating to the foot.