

## THE NEW EXPLORATION OF THE AMAZON RIVER, BY PROFESSOR ORTON.—OVER THE ANDES.

No. 7.

### THE COMMERCE OF PERU.

It would be quite as easy to ascertain the revenue of Atahualpa as to find out the present exports and imports of Peru. Both are impossible. The wildest confusion prevails in the custom houses, as well as in the minds of the people, regarding the commerce of the republic. But better days are coming, as the government has just established a statistical bureau.

Peru under the Incas was essentially an agricultural nation, without trade and with few mechanical arts. In many respects it resembled the Hebrew nation. The empire must have been a magnificent shell, that should so suddenly collapse on the appearance of a hundred Spaniards. It is a signal proof that agriculture alone will not preserve a people. Roads there were, but for military communication, not for commerce. Pizarro had sense to see that Cuzco was too far inland; so he founded Lima, the most lasting monument of his wisdom.

Peru no longer leads the South American republics in enterprise and thrift, for Chili now bears the palm. Peru has reached her level for the present. By a system of official stealing and reckless financiering, she has brought herself to the verge of bankruptcy. Everybody seeks office to sap, not to serve, the government. Every city hangs on the skirts of Lima. Arequipa, the second city in Peru, stands like a beggar at the door of the public treasury, receiving \$80,000 annually; and even imperial Cuzco holds out her hand for \$30,000. Employees distant from the head center (as Iquitos, for example) go unpaid. Yet Peru has immense capabilities. She is the France of the continent. With the great Pacific on her left and the navigable sources of the Amazons on her right, with mountains of mineral wealth untouched, with highland valleys like the hanging gardens of Babylon for beauty, and with plains and reclaimable pampas which might equal Egypt in fertility, Peru is potentially one of the richest countries on the globe. But she must have a more substantial and permanent basis of prosperity than guano and saliter. The wealth thus suddenly acquired has diverted the people from the slow but surer sources of national growth. Whoever heard of an original patent taken out by a Peruvian? Where is the vessel that was built in Peruvian waters? What manufactures thrive in Peru? We can think of only one success, the powder factory at Lima, which the government runs, dispensing the "villanous saltpeter" at thirty cents a pound. There was once a woolen factory at Cuzco, but it is now silent. Commerce is almost entirely in the hands of foreigners. Take out what foreigners have done for Lima, and little would be left but the bull ring.

The annual revenue from guano (including saliter) and customs is about \$25,000,000. To the railways now nearly completed by Mr. Meiggs, Peru must look for an advance. It is a fact that the receipts at the custom house in Callao have increased by one million of soles every year since the beginning of the Oroya railroad.

In eastern Peru, hats, aguardente, salt, turtles, salsaparilla, tobacco, and hammocks are the main exports. Trade has vastly improved since the establishment of steam navigation on the Amazons. But until there is a better outlet than miserable Balsa Puerto, it must be inconsiderable.

On the coast, the majority of the sailing vessels are Anglo-Saxon. There are a few French steamers; but the Pacific Steam Navigation Company, founded by an American, the late Mr. Wheelwright, is the most prosperous navigation company in the world. It has a fleet of seventy steamers, some of them the largest afloat, with an aggregate tonnage of over 200,000. The six best harbors of Peru are Payta, Chimbote, Callao, Islay, Arica, and Iquique. But all are roadsteads opening to the north; and of each it can be said, as a captain sarcastically remarked of Mollendo, "the harbor is entered as soon as the ship turns Cape Horn." The wealth of Peru lies mainly in the following productions:

#### GUANO.

This valuable fertilizer, whose virtues were known to the Incas, comes no longer from the Chincha Islands, which have been pretty thoroughly scraped. It is now shipped from the Guñape Islands, where the deposit will last about eighteen months. The principal deposits yet untouched are those of Macabi Island, Lobos island, Viejas Island, Lobillo Island, Huanillo Island, Huanillo Point, White Point, Pabollon de Pica, and Chiapaná Bay. The guano now in the market is inferior to that of Chincha, containing five per cent less of ammonia. Peru owns but four millions of tons (the rest being mortgaged to Dreyfus & Co.), worth \$35 a ton where it lies, or £13 a ton in Liverpool.

#### SALITER (NITRATE OF SODA).

This formidable competitor with guano is found in the Province of Tarapacá, especially on the Pampa del Tamarugal. The average yield is 4,000,000 quintals; but were the senseless restriction on its exportation (25 cents per quintal) removed, the quantity would be tripled. It is mainly exported from Iquique, where the price is about \$2.50 a quintal. Mixed with guano saliter (or "caliche" as it is called in the crude state) is the best compost for cereals. In the deposit at La Peña Grande, fossil birds have been discovered nine feet below the surface.

#### SUGAR.

In many respects, this is the most important production of Peru. All along the coast, wherever the land is watered by streams or irrigation, the cane grows luxuriantly (from 15 to

20 feet) and yields 85 per cent of juice, having 12° or 15° Baumé. The green and ripe are seen in the same field; men are cutting at one end and planting at the other. The cane requires replanting but once in ten years, and gives a crop every fourteen months. It is exported mainly from Eten (12,000 tons annually)—the richest agricultural region in northern Peru—Pacasmayo (800 tons), Malabrigo, Huanchaco, Chancay, and Pisco. The bulk goes to Europe to be refined. A superior quality is grown in the interior at Abancay, which is sent to Bolivia.

#### COFFEE.

A small quantity is produced at Guadalupe near Pacasmayo, which is second to none in richness of flavor. Its excellence is due to the fact that it is grown in the shade, and with the greatest care. This "Goyburu" coffee, as it is called, brings fifty cents a pound at the hacienda. A very choice article (valued at \$1 a pound) is made by selecting the smallest Goyburu; but it is not in the market. Fine coffee grows also at Huauuco and Urubamba.

#### COTTON, GRAIN, AND LIQUORS.

A very fine article, next to sea island, has been grown at Pacasmayo; but the yield, only 50 or 60 lbs. to the acre, is not encouraging. It suffers from mildew. The points from which cotton is exported are Pacasmayos (100,000 lbs.), Payta, Eten, Chancay, Lomas, and Pisco.

Rice is now imported from China direct and from India via England, so that little is raised. The usual yield is 200 fold. Its production is nearly confined to Eten, Pacasmayo, and Huanchaco.

A prime article of corn, quite different from the short, particolored ears on the highlands, is grown to some extent on the coast; 700,000 lbs. passed through the custom house of Pacasmayo last year.

The best cacao comes from the Department of Cuzco, especially from the hacienda of Echarati. It brings 60 cents per pound in Lima, or double the price of the Guayaquil.

The province of Moquegua is the Bordeaux of Peru; and a large amount of rum and wines are exported from Pisco. The "Italia" is the leading brandy. Ordinary "Pisco" is worth \$1 a bottle; "Locumba," \$2.

#### TOBACCO.

This grows luxuriantly at Eten and Pacasmayo, sometimes standing eight feet high with leaves four feet long. It is sent chiefly to Chili. Pacasmayo exported 100,000 lbs. in 1873. Tobacco is also grown along the Urubamba and Utcubamba.

Coca is almost confined to the Urubamba province, and is not exported from the coast, as it is consumed in Cuzco, Puno, and Arequipa. It is considered inferior to the coca of Yungas, Bolivia.

#### CASCARILLA BARK.

Less and less of this is exported every year, as the hunters have to go farther and farther into the interior for it. The greater part now goes down the Amazons from Bolivia. It is shipped from Payta (coming from Loja), Pacasmayo (coming through Cajamarca, nearly 200,000 lbs. in 1873), Islay, and Arica (coming from Cuzco and Bolivia). At Arica, it is worth \$90 a quintal.

#### WOOL.

After guano and sugar, alpaca is the great export. It comes almost entirely from the departments of Puno and Cuzco; and the outlets are Pisco, Islay, Mollendo, and Arica. But Arequipa is the great center of the alpaca trade. Such is the reputation of the Arequipa brand that the wool is generally taken to that city from other points to be re-sorted and re-packed. The alpacas thrive best in the black, almost barren, boggy lands from 13,000 to 14,000 feet in elevation. Shearing time begins, December 15; but an individual is sheared only once in two or three years. A fleece of three years is of course the largest and commands the best price. It is now worth in Arequipa \$70 a quintal. Vicuña wool brings \$100 a quintal; but little is exported. The sheep's wool of Peru ("cholo") is of middling quality, inferior to the "mestigo" of the Argentine Republic. It brings twelve pence in England. It is exported from Arica and Islay.

About 4,000 goat skins are exported annually to the United States from Payta, and a few chinchilla skins from Arica.

#### MINERALS.

Arica, being the main port of Bolivia, ships the most metal, especially bar silver (at \$12.4 per mark), copper barilla or powdered ore (at \$18 a quintal of 70 per cent), and tin barilla (at \$19 a quintal of 70 per cent). Pacasmayo and Chimbote will ere long export considerable silver ore and bituminous coal, the latter having been discovered of excellent quality and in large quantity near the line of the Chimbote railroad.

Besides these exports, Tumbes yields petroleum, Huanchaco, starch, Quilca, olives, and Amotape (near Payta), cochineal. Orchilla was formerly sent from Payta; but a better article has recently been found on an island off Mexico.

JAMES ORTON.

### DECISIONS OF THE COURTS.

#### United States Circuit Court.—District of Connecticut. PATENT CARRIAGE WHEEL.—SARVEN vs. HALL & CO. [In Equity.—Before Woodruff, Judge.]

A patent for a carriage wheel in which the spokes have tenons inserted in the hubs, and are sustained against pressure endwise by the shoulders of the tenons, and laterally by collars on each side bolted together, is infringed by a similar wheel in which the spokes are made tapering without shoulders, and enter into corresponding mortises in a solid collar and in the hub, and are sustained endwise on the inclined sides of the mortises. The defendants were led into adopting this form in consequence of their employment of the shoulders having been urged by the patentee's counsel in a former suit as constituting the breach of the patent; and though an injunction was ordered against them, it was without costs.

*John S. Beach, Samuel S. Fisher, Charles K. Uder and Charles E. Blake, for complainant.*  
*Charles R. Ingersoll and Benjamin F. Thurston, for defendant.*

#### The Turner Car Brake Patent.

For some time past, an actively prosecuted litigation has been going on against several railways in Illinois and elsewhere for alleged infringement

of the late Charles B. Turner's patent, of which Batchelder and Thompson are assignees, dated November, 1848, and extended on November, 1852. Henry W. Bishop, Esq., Master in Chancery of the United States Court in Chicago, recently determined that the railway companies, who have associated together for the purpose of defence, must pay damages to a very large amount, over \$60,000. A bill of exceptions to the Master's ruling was filed and the case argued before Judge Drummond, who sustained the Master in all particulars, and confirmed the report. Judge Drummond further held that the Batchelder and Thompson patent is good and valid; that the inventors never neglected or abandoned such patent; that the patent covers the connecting of all the brakes of a car with windlasses so that a brakeman, by operating any one of the windlasses, can apply brakes to all the wheels; and that the Stevens' brake (used by the railway companies in question) contains the covered combination.

Judgment for the plaintiff for \$67,344.99.

### Recent American and Foreign Patents.

#### Improved Pipe Joint.

John Demarest, Mott Haven, N. Y., assignor to himself and Jordan L. Mott, of same place.—The invention consists in pipes having corresponding end enlargements, with two annular recesses to form chambers, the former to receive an extension, and the latter to form a close chamber for packing, so that the packing will not be exposed to the water or acid, and thus gradually be forced out of its place into the pipe.

#### Improved Combined Shutter and Window Fastener.

William T. Fry, Brooklyn, N. Y.—This invention consists in fastening the catches of a shutter and window by the same lever, but so that they may be unfastened separately. The arrangement is such that, when the shutter or door is fastened, all parts, except the inside handle, are concealed from view, and access from without for forcible entry is effectually prevented, and the fastening and unfastening of shutters can be effected without opening the windows. A spring is arranged with the shutters to throw them open when they are unfastened. It may also be used with gates and doors, if required. The spring catch is provided with a metal case made in two parts, which forms a lining for the mortise through the sill or frame. The parts of the said casing are contrived so that, when they are placed together preparatory to being put in the mortise, they receive the pivot of the catch in opposite holes formed for it, and are held together to confine the catch by the walls of the mortise. The said lining may be provided with a flange on the inside of the sill, to prevent it from being pulled outward. The invention also consists in utilizing this shutter fastening for locking the window sash by means of a stud catch on it, projecting down from the lower edge, and engaging the spring catch.

#### Improved Cooking Stove.

Solomon Long, Mayville, O.—This invention is an improvement in the class of stoves whose fire boxes are provided with movable or adjustable backs. The improvement relates to the arrangement of two pivoted or hinged plates, one forming, when elevated, the back of the fire box and supporting the other, which thus forms the horizontal inner top plate of the stove.

#### Improved Spring for Chairs, etc.

William T. Doremus, New York city.—To the lower part of the seat is attached a centrally slotted metallic plate. Through this passes the screw, by which the chair seat is raised and lowered. The seat slot is elongated to admit of the oscillation of seat. Two rubber blocks are placed one upon each side of the plate, and may be kept from turning by toes, said toes entering notches in them. The toes, when the chair is oscillated, press laterally against the rubber, and thus make the spring more efficient.

#### Improved Fishing Stake.

John O. Campbell, Alpena, Mich.—This invention consists of a fishing stake composed of two parts connected together by a socket and spring catch, in such manner that the upper portion can be readily detached from the lower portion, just above the ground when the season is over, to be preserved, and then be readily attached again at the beginning of another season.

#### Improved Mangle.

Ernst Gundlach, Hackensack, N. J.—The mangle is firmly secured by suitable clamping screws to the table. The standards, of cast iron, support the mangle rollers. The shaft of the upper or pressure roller turns in a frame which is pivoted to the standards above the clothes roller. The upper roller is made of larger diameter than the lower, both being made of cast iron. The frame is also made of cast iron, in forked or U shape, with a central lever, extending toward the person mangling, which is supplied with a handle for pressing the roller down, or with a weight suspended at its end for producing the necessary pressure on the lower roller. The frame is applied to standards eccentrically, so that the pressure of the roller, when brought down to act on the clothes roller, is in proportion as the degree of eccentricity to the length of the lever and the weight applied, which may be increased or decreased according to the power desired to be exerted. By holding with one hand the lever of the pressure roller, and turning the crank with the other as long as desired, the clothes are rapidly mangled. They are then taken off and replaced and run through the roller again, and so on till they have all passed through the mangle.

#### Improved Rock Drill.

William Roberts, Jr., Copper Falls, Mich.—This invention consists in fastening drills in a solid chuck, stock, or head by a couple of half boxes and tapered bolts, the said half boxes having the shank of the drill between them, and entering the socket of the stock. The bolts pass through the stock on opposite sides, and bear against the back of the boxes in grooves, so as to wedge them tight against the shanks of the drill, and hold it in the boxes, and also hold the boxes from working out by the notches in the back.

#### Improved Shaving Conductor for Planing Machines.

William Weaver, Burlington, Vt.—The object of this invention is to produce an improved shaving conductor for wood working machinery, by which the shavings are carried off by the force imparted by the rapid revolutions of the cylinders and side cutters, and transmitted to elevators or other receptacles, whether used with or without suckers or blowers. The conductor, covering the machinery, protects the gearing against the accumulation of shavings, leaves every part of the machine fully within view of the workman, and permits readily any repairing of the same at any desired moment. The invention consists, mainly, of a hood-shaped conductor adapted in form to a cylindrical planer and side cutter, combined with an extension casing leading to the opening of the blowers, suckers, or receptacles, and turning in a circular sleeve, so as to be lifted off the machinery. The chip breaker of the side cutter is suitably enlarged and recessed for the passage of the shavings into the conductor, which may also be arranged separately for the side cutter.

#### Improved Curtain Fixture.

Charles C. Moore, New York city.—This invention has for its object to improve the construction of the shade roller described in letters patent No. 75,448. Upon each end of the roller is slipped a metallic tube, which tubes are made with dies, so as to be exactly of the same size and perfectly true. The tubes are designed to receive the side parts of the shade, and cause it to roll up true, thus obviating the annoyance in hanging and using shades arising from the rollers not being exactly true. In the sides of the tubes are formed small holes, to receive tacks, which at the same time fasten both the shade and tube to the roller. A broad beaded screw is screwed into the ends of the roller, which, in connection with the end of the tube, forms the spool upon which the suspension cord is wound. By this construction the length of the spool upon which the cord is wound may be adjusted as required by simply turning the screw in and out. Upon the outer edge of the end of the tube is formed a flange or bead, projecting outward, and upon the outer edge of the head of the screw is formed a flange or bead, projecting inward. These flanges or beads are designed to bear against the cord when it comes to either end of the shank of the spool in being wound thereon, so that it cannot make more than one coil upon itself, and to cause it to at once begin to pass back along the spool.

#### Improved Riding Attachment for Plows.

Andrew H. Ballagh, Bowersburg, assignor to himself and Martin McNitt Mound Station, Ill.—This invention is an improvement in riding plows; and consists in an arrangement of plow beam with a triangular frame, supported on caster wheels, the parts being so connected that the same rods which serve to brace or hold the plow beam in proper position serve also as draft rods.

**Improved Carriage Spring.**

Robert Walker, Harrisville, Ohio.—The upper and lower halves of an elliptic spring are of uniform size, and composed of three leaves. Flanged plates are on the outside of these halves, the flanges of which project inward. A knee joint stay is grooved, the ends of which are attached by joint pins to forked bolts passing through the plates and through the halves. The joint in the stay forms the arc of a circle, which places the center of the joint outside of a straight line drawn from one to the other of the joint pins at the ends of the stay. When the spring is compressed the joint gives, and when the spring reacts, the stay limits the motion and prevents breakage. Springs of angular form at the ends of the elliptic are confined to cleaves at their angles, with their ends resting on the plates within the flanges. Springs of oval form are also similarly confined to the cleaves, with their other ends separated and extending inward. Pads of rubber are attached to the inside of one of the ends of each of these springs. When the elliptic is compressed, these ends are brought in contact with each other, and the pads prevent noise. These springs may be so arranged that, at ordinary pressures, they will not act, and so that they will not be brought into requisition, except when the pressure is sufficient to jeopardize the safety of the elliptic; but they are designed to act as a safeguard at all times.

**Improved Vibrating Propeller for Vessels.**

James D. Fraser, Picton, Canada.—This invention is an improvement in the class of propellers formed of paddles or buckets hinged to horizontal shafts or arms, which vibrate on a vertical axis. A hollow vertical crank shaft extends from inside down through the bottom, and is stopped at the bottom of the keel. Below the bottom of the boat this shaft carries two arms extending from opposite sides nearly the width of the bottom of the boat. The buckets are hinged upon these arms to swing freely between short secondary arms, which project laterally in two sets at right angles to each other, so that the said buckets are only swung a quarter of a revolution. Any suitable number of these crank shafts and propellers will be used in a boat, being arranged at intervals throughout her length, and the power may be connected to them in any approved way.

**Improved Saw Set.**

Jerome N. Brizks, South Adams, Mass.—The body of the saw set is made in two parts, the rear parts of which are secured to each other by a screw bolt which holds them together, and by a pin that prevents lateral movement. The lower part is made with a downward projection to enable it to be held by a vise. Two arms, projecting at right angles from the opposite sides of the lower part, and the bases of which project along the sides of said part, are secured to it by a bolt which passes through it and through slots in the bases of the said arms. The parts of the bolt that pass through the slots in the said bases are flattened so as to hold the arms exactly in line with each other. Upon the upper sides of the bases of the arms are formed projections, to enter the spaces between the teeth and stop the saw plate in proper position for the tooth to be operated upon, while the arms support the saw plate in its horizontal position, so that it cannot spring or bend. By loosening the nut of the bolt, the arms may be readily adjusted according to the size of the saw teeth.

**Improved Grain Conveyor.**

Constantin Lazarevitch, Brooklyn, N. Y.—The object of this invention is to obviate the necessity of shoveling grain in the holds of vessels, for the purpose of distributing it and properly trimming the vessel. A shell wheel is arranged, composed of a bottom plate and an inclined annular upper plate, separated by vertical partition plates, which latter divide the space between the two plates into a series of compartments which have their outlets at a space between the outer edges of the upper and bottom plates. This wheel is placed below the hatch and given a rapid revolving motion, and the grain, supplied by suitable hoppers and conduits, is thrown from the wheel, through the compartments and space, by centrifugal force against the sides of the vessel and bulk heads. The grain is thus distributed, as fast as the elevator delivers it, it is claimed, without hand labor, and in the most perfect manner. The speed of the machine may be regulated by means of cone pulleys or otherwise, so as to simply clear the wheel and allow the grain to fall nearly vertically for filling the middle of the hold.

**Improved Liquid Measure.**

Wills L. Weaver and A. Wallace Johnson, Plattsburg, N. Y.—This invention consists in arranging a measure of suitable size with a vertical central slide gate, which is provided with a horizontal subdivisional shelf, so that, at pleasure, the whole half or other subdivisional measure may be filled.

**Improvement in Hardening the Surfaces of Iron.**

Robert T. King, of Pana, Ill.—The object of this invention is to furnish a suitable compound for case-hardening iron, or converting the surface into steel; and it consists in lamp black, sal soda, muriate of soda, and black oxide of manganese. The iron is heated in any suitable forge or furnace, and, having been wrought into the shape of the implement or article to be used, the surface thereof is prepared by grinding. The compound is applied by sprinkling or sifting, or by immersing the iron therein. The effect is to carbonize and steelify the surface of the iron.

**Improved Bolt for Doors and Gates.**

Josiah Smith, Southold, N. Y., assignor to himself and L. F. Terry, same place.—The inner plate of the fastening is cast with two keepers to receive the bolt, which has a loop cast upon it to serve as a handle for operating it upon the inner side of the door. The rear keeper is cast with a transverse slot through its middle part, to allow the handle to pass through when slipping the bolt into place. The outer plate is cast with a flange to overlap the edge of the door. A loop or handle, the stem of which passes through a slot in the outer plate, a slot in the door, and a slot in the inner plate, enters a hole in the bolt, where it is secured in place so that the bolt may be moved back and forth from the outer side of the door or gate. Upon the outer plate is cast a loop, which is made exactly like the handle in size and form, and which serves as a guard to prevent the bolt from being pushed back by accidental means.

**Improved Mitering Machine.**

Christian Loetscher, Dubuque, Iowa.—This invention is an improvement in devices for forming miter joints, wherein the bar, against which the stuff is fed to the saw, is pivoted to another bar adapted to slide in a groove in the saw table. The sliding bar may be reversed, and is designed for use as a stop when a number of pieces of the same length are to be sawn.

**Improved Table Knife.**

William Henry Andrew, Sheffield, England.—This consists in a simple and effective mode of securing the handles of cutlery to their holding tangs; and it consists in the employment of a bent piece of metal, angular plate, or cap, made of any suitable metal and configuration, applied to the handle next to the bolster, or at its lower end, and provided with an opening for the insertion of the holding tang, which is secured in position by a rivet or pin passed transversely through the cap plate, handle, and tang.

**Improved Paint Compound.**

Carl August Stitzler, Kitzingen, Germany.—This invention is especially designed for protecting stone walls and outer surfaces of all kinds, cellar and stable walls, machinery, etc., and is for painting wood, and producing wall and roof papers. The compound is impervious to moisture and air, of great durability, and, though pliant and elastic, of great hardness after having thoroughly dried. It consists, mainly, in silver litharge ground with sesquioxide of manganese, to which balsam of sulphur turpentine is added. Said balsam is produced by dissolving sulphur and linseed oil in turpentine, the dissolution being accelerated by heating. Zinc white is then added to the foregoing, thoroughly ground, and then combined with soluble glass Venice turpentine, spirits of turpentine, oil varnish, pulverized metallic iron, and Portland cement. The whole compound is then thoroughly mixed and ground together, producing a bluish gray paint, which may be colored to any desirable tint by adding the coloring pigments in suitable quantity.

**Improved Toy Putty Blower.**

Nathan Joseph, San Francisco, Cal.—This invention consists of a putty-blowing tube for children, constructed by simply rolling up the sheet into cylindrical form, and overlapping the edges for the joint, without solder or other fastening, with a mouthpiece, whereby the lips are protected from the sharp edges of the metal.

**Improved Fireplace Lining and Front.**

Edwin A. Jackson, Union Square, New York City.—Heretofore it has been a difficult matter to construct an ornamental lining for grates and fireplaces that would stand the continual expansion and contraction to which such linings are exposed from repeated fires without breaking the tiles or blocks of which it was composed, or breaking them loose from the wall to which they were attached. This ornamental lining has usually been fastened with cement, but the tiles or blocks have been set like window panes in metallic frames. These difficulties are designed to be overcome by the present invention, in which tiles of any form or description, or metal blocks of any design, figure, or size, are securely bolted or fastened to a metallic backing made in the form desired for the fireplace or grate, room being allowed for expansion, so that the lining is not damaged by the heat. The same inventor has also devised a novel means for holding an ornamental tile front for fireplaces in its proper position. The tile is confined to a cast metal frame by means of border moldings. The outer edges of these moldings are flush with the outer flanges of the frame. The inner edges lap on the tile so as to securely hold it in place, and bolts are cast into the moldings, which pass through the frame by which the moldings are held.

**Improved Car Coupling.**

Allen Strain, Greenfield, Ohio.—The drawbar has vertical slots at the sides for the admission of a lever. One slot has at its upper end a notched recess toward the open side of the drawbar, which supports the lever when raised to admit the coupling link. The latter is provided with two notches, wedge-like ends, and a higher central part. When the link enters the drawbar it passes, with its end, below the raised lever till the central bar strikes the same and causes it to drop into the notched part of the link. A pivoted triangular plate presses by its own weight, with its base, on the lever, to prevent the escape of the coupling link, in consequence of the jerks and vibrations of the car. To a lever extension of the plate, and also to the end of the lever, is connected a wire rope which connects with a treadle on the platform of the car, so that the attendant may easily raise the plate, and with it the lever, into the recess, in readiness for coupling.

**Improved Apparatus for Compressing Cast Metals.**

Horace W. Mann, Omaha, Neb.—The object of this invention is to provide a portable convenient apparatus for solidifying cast metals in their liquid state by compressed air, which is forced directly on top of gate in flask after the metal is poured. This invention consists of a portable reservoir for compressed air, with a pump attached, which latter is connected by rubber hose with a cylindrical cap that is fitted and clamped to a cylinder that is fastened to the top of flask. Both cylinders are coupled together by projecting flanges and clamps. The flask cylinder is provided with a clay wash, and, previous to the pouring of the liquid metal, with a ring or cap piece, set on top to prevent the hot metal from coming in contact with the clay wash. The ring is removed as soon as the metal is poured, the cap is then clamped on cylinder and a stop cock opened, so that the compressed air is let directly on top of metal through the gate of flask, compressing thereby the metal in the molds.

**Improved Car Coupling.**

Xaver Krapf and John F. Boerckel, Allentown, Pa.—The drawhead is rounded off at its front part and provided with a backwardly curved hook, over which the coupling link slides easily, and is then retained without being disconnected by the jerking of the car. The coupling link is pivoted to the drawhead, and at one side of the latter are arranged a series of upwardly inclined holes of different heights. A bell-crank-shaped lever with a treadle is pivoted, sidewise of the link, to the link pivot bolt, projecting with its curved extension hook under the link and lifting the same into horizontal or inclined position when lever is turned. When in inclined position for coupling, it is secured therein by placing a pin into one of the holes before mentioned, selecting the hole required for producing such an inclination of the link as the height of the platform of the car to be coupled renders necessary. The coupling link strikes then, on the approach of the adjoining drawhead, the curved hook of the same, and is thereby gradually raised, allowing the pin to drop out, and passes over the hook, dropping on the drawhead back of the hook and coupling the cars. The uncoupling is quickly performed, as merely the lifting of the link above the drawhead, by pressure on the treadle, is required.

**Improved Urinal.**

John C. Garney, New York City.—This invention consists, mainly, in a vessel of broad oval base and flat shape, with a handle arranged at the top, in such a manner that the center of gravity falls to the rear of the same. The rear part is covered under suitable inclination, so that the upsetting is prevented, while the forward projecting pointed spout in front of the handle facilitates the use, and furnishes an opening of sufficient size for thoroughly cleaning.

**Improved Milk Can.**

James F. Cass, L'Original, Canada.—This invention consists in a conical cover for the can, with openings at or near the base, and tubes in connection with them; also, an opening at the top and a tube in connection with it, for ventilating the can and carrying off the animal heat and the odors of the milk. Fresh cool air is carried in at the lower holes by blowing against the cover, and forces the warm air out through the tube at the top, so as to cool the milk efficiently as it is in waiting on the stand at the farmer's gate, or when being conveyed to market. This milk can is intended principally as a carrying can in connection with the cheese and butter factories.

**Improved Churn Dasher.**

Andrew J. Hudson, Camden, Tenn.—The dasher is made in the form of a two-armed bar. Upon the upper side of one arm is formed a rounded hollow, or concave groove, inclining outward and upward, and in the under side of the other arm is formed a similar groove inclining outward and downward. Upon the upper side of one arm and upon the upper side of the other, respectively below and above the other grooves, is formed a recess having a convex bottom and vertical sides. The outer shoulder of the recess is curved and extends from the forward side of the dasher arm to about the center of the rear side of said arm, where it terminates in a notch. By this construction the dasher, in its movement, throws the milk in currents in different directions, which currents collide with each other and with the sides of the churn, throwing the milk into violent agitation, and bringing the butter in a very short time.

**Improved Ventilator and Pipe Hole Plate for Tents.**

Robert Brien and William Brien, Jersey City, N. J.—This invention consists of a metal plate having a hole for ventilation, or for the projection of a stove pipe fastened in a large opening in the tent cloth, and provided with a valve for closing the ventilator or pipe hole. The plate supports the valve and the stove pipe protects the cloth from the heat of the pipe.

**Improved Carriage Top Joint.**

William B. C. Stirling and John W. Pohlman, Batavia, O.—The object of this invention is to provide, for the purpose of raising and lowering the tops of carriages of all kinds, an improved joint or prop, by which the braces are effectually extended and rigidly supported when the top is thrown up, and neatly and compactly arranged when folded down. It consists of a combined joint for the braces of a carriage top, so that the same folds easily into parallel position, together with an abutting extension of the supporting brace, which locks a projecting rib into a corresponding recess of the extended brace, for keeping it rigidly in position when the top is opened.

**Improved Machine for Building Earthworks.**

Harvey Morey, Cameron, Texas.—This invention consists of a strong frame, mounted on casters or wheels, for moving along the ground readily, and having an elevated platform hinged at one side, and held down at the other side upon powerful springs, on to which the earth is scraped up an ascending way, or otherwise delivered upon it. The earth is finally discharged in the direction of the place where it is to be spread by tripping the platform and allowing the springs to throw it up with sufficient force to project the earth from it. A windlass is employed for forcing the platform back again for reloading, with ratchets and pawls for holding it. This machine is more particularly designed for levee building and, it is believed, will be found very serviceable in building up banks of considerable height, by saving much of the labor of the animals in moving themselves and the scrapers up and down the banks.

**Improved Latch for Gates.**

George N. Sharp, La Plata, Mo.—This invention has for its object to improve the construction of the latch for which letters patent No. 123,075 were granted to the same inventor June 18, 1872, so as to make it more reliable in use and less expensive in manufacture. The catch moves up and down through a slot in the bottom edge of the case, and has hooks formed upon the outer and inner ends of its upper side. The inner arm of a lever passes through a slot in the top edge of the case and enters the cavity of the catch and its lower end is so formed that, when moved inward, outward, or upward, it may raise the catch and unfasten the gate or door. The upper arm of the lever projects upward, to serve as a thumb piece for operating. Upon the lever is a plate, so formed as to wholly cover said slot or opening, and thus prevent the entrance of rain and snow into the case. A partition is formed in the inner part of the case, and its upper part is curved to serve as a stop to the catch when thrown upward by the slamming shut of the gate, to cause the catch to drop before the gate, in its rebound can carry the catch bar out past the catch.

**Improved Hub Boring Machine.**

David B. Wright, South Amherst, Mass., assignor to Cynthia A. Wright of same place.—The frame of this hub boring machine consists of a larger base part and the vertical standard supported thereon. The larger part is laterally connected by pieces which support the wheel to be bored in horizontal position, forming a platform for the same, to which it may be rigidly fastened. A lower lateral piece carries centrally a vertical, to which are pivoted the toggle levers, which have jaws at their upper ends, which take hold of the hub at diametrically opposite sides, and center it accurately below the boring mandrel. Jaws are adjusted to the hub by a link connecting the toggle levers and screw, which is placed vertically below the axis of the mandrel, securing thereby the exact central position and bore of the hub. The mandrel is set, in the usual manner, in vertical position on the standard, and driven by hand or other power.

**Improved Shoe Last.**

Parker P. Paul, Brooklyn, N. Y.—This invention consists of detachable plugs of wood and a fastening device composed of a screw-threaded bush and rollerscrew in the bottom of the last, for driving the tacks into and temporarily fastening them on the soles. The object of this is to remove the plugs and fit in new ones from time to time as they wear out, and thus always have solid substance for the tacks. This part is applicable to the soles, having a metal plate on the bottom for riveting or clinching the tacks by which the insole is fastened to the upper in the process of making machine-sewn shoes.

**Improved Sleeping Car.**

G. Herrmann Lindner, Brooklyn, N. Y.—The seats of the lower berths are constructed of three pivoted cushions, the main cushion forming the seat, and the others the back. The seat can be swung out to make the middle part of the berth. A lug-shaped extension limits its motion, and it is suitably supported when drawn out for the berth. The back cushion is folded down into horizontal position into the place made vacant by seat. Either back cushion may be slightly elevated into an inclined position for head rest, and secured. The seat frame dividing each section extends slightly above the top cushion when in position as back cushion, and allows thereby a full view of the car and a free passage of air through the same. When the top cushion is locked in its upward position it serves as support for the upper berth, which is arranged immediately under the top of the car, supported in front by horizontal projections, and in the rear by bolts, which lock into nosings provided at the upper end of guide grooves. When it is desired to lower the upper berth, rear bolts are withdrawn, so that the rear side of berth slides down in grooves while the front part swings in pendulous arms. The berth assumes thereby an inclined position. Front bolts are then withdrawn from pendulous arms till the berth, swinging on pivots, assumes a horizontal position, resting on the up turned top cushions. The same operation is reversed when placing the berth back in its old position, the front and rear bolts locking by mere pressure by the action of their spiral springs.

**Improved Machine for Facing Cylinders.**

Thomas M. Henderson and Frank L. McDonald, Omaha, Neb.—The object of this invention is to provide means for facing the ends of steam cylinders, and cylinders for other purposes where steam or watertight joints are required, and it consists in a cone which is rigidly fastened to a central shaft. Four arms pass through a projecting flange near the top of the cone. There is another cone through which the shaft passes, and to which it is connected by a groove and a feather, but neither the shaft nor the cone revolve. This cone forces the arms outward against the cylinder. The outer cone is so arranged that the arms bear at or near the end of the cylinder. The lower end of the shaft is supported by the spider, which is adjusted in a central position in the cylinder. On the top of the inner cone is a novel gear through the medium of which the feed screw is revolved. A frame is arranged, consisting of a hub and the two projecting arms which support the feed screw and cutting tool. The cutter is attached to a crosshead which moves from and toward the center of the cylinder in grooves in the arms. The feed screw works through the crosshead as through a nut, and when revolving it carries the crosshead and cutter over the end of the cylinder. The frame is revolved by means of a spur gear wheel and pinion, the gear wheel being rigidly attached to the hub of the frame, and the pinion being on the end of the crank shaft. As the crank is turned the frame (carrying the cutter) is revolved around the shaft, and at the same time the screw is turned for feeding up the tool.

**Improved Gate Fastener.**

Joseph H. Nichols, La Fayette, Ill.—This invention relates to the class of gate fastenings so contrived that the gate closes under the catches, and is then lifted up into them and held by a suitable arrangement of levers. A weighted eccentric lever is employed, which effectually secures the gate while it remains down; and only releases it on being lifted up.

**Improved Subsoil Gang Plow.**

Christian Myers, Marysville, Cal., assignor to himself and Francis J. Schaeffer, Davenport, Iowa.—To make the plowshare detachable, it is produced in one piece with the point, and the latter is extended back to the full length of the landside. A hook is welded to the lower side of share in the longitudinal direction of the same, and slightly rounded off at the lower side to offer less resistance to the earth. The rear part of point is provided with an oblong aperture which corresponds with a similar one of the landside. The land side is recessed for the extension of point, and the under side of the plow is extended forward, and provided with an oblong aperture, through which the hook is introduced. The share is then carried toward the landside till the hook closes firmly on the under side and the rear part of the point into the recess of landside. A wedge or key is then driven through the holes, fastening thereby the share rigidly and strongly to the supporting parts of the plow, allowing at the same time the ready taking off, sharpening, or replacing of the share.

**Improved Ice Creeper.**

Reginald H. Earle, St. John's, Newfoundland.—Upon the upper side of a narrow plate, which reaches across the sole of the boot and along its side edges, are formed grooves to receive the side edges of two plates, the inner parts of which are halved, so as to overlap each other without producing any extra thickness. The movements of the last mentioned plates, as they are slipped out and in, are limited by pins which project through short longitudinal slots. The outer ends of the plates are bent upward at right angles, and have spikes attached to them to enter the edges of the boot soles. A set screw passes up through the narrow sole plate, so that its forward end may press against the plates and hold them against the flanges that form the grooves in which the edges of the said plates work. To the under side of the sole plate are attached short spikes to take hold of the ice, and thus prevent the wearer from slipping.

**Improved Water Wheel.**

Mordeca H. Heyman, Oshkosh, Wis.—This invention consists of a horizontal reaction wheel, receiving the water in the top and discharging at the periphery, for which purpose it has issues formed in parallel circles. In front of the latter, at a distance suitable beyond them, in order to allow the water to freely enter the circle in which the issues are formed, is a curved or angular shoulder, from four to six times larger in area than the issues, against which the reactionary force of the water is delivered, in a manner calculated to give the best results in respect of power.