THE ENGLISH TELEGRAPHS.

BY GEORGE B. PRESCOPT

CONSTRUCTION OF THE LINES.

The construction of the English telegraph lines is uniformly excellent, and reflects great credit upon the Engineering Staff, in whose hands it is placed.

The timber used for poles is generally larch treated with sulphate of copper, or red fir creosoted.

The creosoting is accomplished by the Bethel process. The poles are placed in an iron receiver and the air exhausted from them, after which boiling creosote oil is forced into them by pressure. This process greatly increases the durability of the wood, pine and spruce being thus rendered as lasting as cedar. The odor of creosoted poles in some places is said to be offensive, but no objection is raised against them in Eugland

The poles are never creosoted until they have been stacked a sufficient length of time to be thoroughly dry.

The cost of creosoting includes a certain margin for loading into trucks, or on board a ship, which is always stipulated for when the contracts are made.

It sometimes happens that a parcel of poles are exceptionally dry, in which case they are given an extra two pounds of oil per cubic foot, costing from six pence to eight pence per pole additional.

When poles are used, which are neither prepared with sulphate of copper nor creosote, they are well seasoned, and then painted, the butt ends being slightly charred from the bottom to a foot above the ground line, and tarred.

The cross-arms are made of English oak, two inches thick and twenty-four and thirty-three inches in length, and are placed alternately on either side of the pole. A twenty-four inch cross arm is placed on the front of the pole a foot from the top, and then a foot lower down a thirty-three inch cross arm is placed on the back of the pole, and so on. In some cases as many as seventeen wires are carried upon a single line of poles of twenty-five feet in length, and no cross arm carries more than two wires, except on the double pole lines, where seven feet cross arms are employed, and four wires are supported upon each cross arm.

All the poles are provided with earth wires, or contact conductors for carrying the wet weather escape directly to the earth, instead of permitting it to leak into the neighboring wires. The earth wire consists a piece of No 8 galvanized iron wire, extending from the top of the pole to the bottom, and terminating in a flat coil attached to the foot of the pole. so as to expose as large a surface as possible to the earth. From the thick earth wire, branches, composed of No 10 galvanized iron wire, are carried in saw grooves sunk in the cross arms, and soldered to the insulator bolts. The work is performed at the factory before the cross arms are carried out on the line. The earth wires sometimes project above the top of the poles, and serve an excellent purpose as lightning arresters.

Great care is taken to keep the poles in a rigidly upright position; and in addition to placing them well in the ground and tamping the earth thoroughly around them, they are well supported with stays made of wire ropes attached to iron rods, which run into the ground about four feet. On straight lines and slight curves, where exposed to the winds, double stays are employed.

INSULATORS.

The insulators on the railway routes are uniformly of the Varley double cone brown ware pattern, and those upon the canals and highways of the single cone white ware, or porcelain. The Varley insulator is regarded as the best, but its greater cost has prevented its exclusive use.

THE CONDUCTORS.

The conductors employed upon the English lines are composed of zinc-coated iron wires of Nos. 4, 8, and 11 gage. The No. 8 gage-0.170 inch diameter-is the size in general use: the No. 4 gage—0.240 inch diameter—being employed upon a few of the long circuits between the more important points, while No. 11-0.125 inch diameter—is used for short

The method formerly followed of allowing the wires to pass freely through the insulators, and fastening them only at distances of half a mile, has been abandoned in favor of binding them at every pole, No. 16 charcoal wire being used for binding.

JOINTING THE WIRES.

Great care is observed in the jointing of the wires, which is invariably performed upon the line, no joints by the wire that known as the Britannia joint. This is made by slightly postponed until then. bending the ends of the two wires and placing them side by side for a distance of three inches, and binding them tightly together with No. 19 wire, and soldering them thoroughly. All joints are required to be soldered, whether the wire be old or new, galvanized or plain. The leading-in wires at the offices are insulated with gutta percha, covered with linen tape and varnished with a preparation made of linseed oil and Stock. holm tar. These wires are re-tarred from time to time to pre-

THE OVER HOUSE WIRES.

The over house wires are erected in spans, supported by iron poles attached to cast iron saddles, which are fitted at the ridge of the roof. The poles are light and well stayed by wire ropes. In London, cables containing 50 insulated wires are suspended by hooks from No. 8 iron wires, carried in the manner described above. The conductors in these cables consist of No. 22 copper wire.

At Newcastle on-Tyne, a strand composed of seven steel wires, of No. 16 gage and 454 yards long, is suspended over the Tyne, and supports a cable containing fifteen conductors, ment highly profitable,

The cables rest upon ebonite chairs attached to the rope by means of rings placed at distances of 12 feet apart.

The over house wires are used principally for lines which are leased by the Post Office Department to private firms or individuals for the transmission of messages on their own special business between offices, factories, etc., and which make a system of nearly 5,000 miles.—Journal of the Tele-

The Chemical Classification of Iron.

M. Frémy, an eminent French chemist who has recently been studying further into the metallurgy of iron and steel, thinks that it would be of much more advantage to founders and metallurgists if commercial iron, which is still classed according to its physical properties, should be known with reference to its chemical characteristics, that is to say, in accordance with the very small quantities of carbon, sulphur, phosphorus, etc., which it may contain, and which chemical analysis would reveal. This chemical classification has for some time past been in use in Krupp's celebrated foundery, where, in fact, nothing is left to chance. Chemists constantly analyze the crude materials and the fabricated products. The scientific and industrial element is intimately connected with the military. Artillery officers examine the manipulations and follow their every detail. Considerable sums are devoted to new experiments, made on the different alloys which may be suitable for cannon, and of each metal tried there is compiled a record which indicates its chemical composition, its advantages, and defects.

According to M. Frémy's investigations, it appears that the best metal for guns is neither iron nor steel, but some combination of both.

New Street Railway Locomotive.

A trial recently took place on the Manchester. Sheffield. and Lincolnshire railway, between the Grange Lane and Tinsley stations, of a tramway engine, constructed by the Yorkshire Engine Company, upon L. Perkin's patent system, for the Belgian Street Railway Company, Brussels. The novel features of this engine consist in its not emitting any smoke or steam into the atmosphere, and making comparatively little noise. The engine used steam at 500 lbs. to the square inch, and maintained this pressure by natural draft without any difficulty. The engine is compound, and expands the steam to the most economical limits, and then condenses it by means of two air surface condensers placed one on either side of the machine. The engine can be driven from either end, all the driving gear being duplicate to obviate the necessity of turntables. The engine accomplished a speed of fifteen miles per hour, drawing its full load up gradients varying from 1 in 200 to 1 in 80.—Iron.

Ballooning Extraordinary.

We recently published a note of Mr. Croce-Spinelli to the French Academy of Sciences, in which he indicated the belief that existence could be maintained at very high altitudes by aeronauts, if they should provide themselves with cylinders of oxygen, to be breathed in the highly rarefled atmosphere. M. Spinelli and Sivel have lately demonstrated the truth of this view by ascending in the Etoile Polaire, a balloon of 98,840 cubic feet capacity, to the immense elevation of 25,841 feet without inconvenience. The barometer level descended 11.7 inches, showing the above altitude, which is higher than that obtained by Gay Lussac and nearly equal to the point reached by Glaisher in his famous ascension. The thermometer at minimum marked 7.6° below zero Fah. The aeronauts, having taken with them all necessary instruments, made a number of valuable observations which, we learn from Les Mondes, will shortly be communicated to the French Academy.

Rain Cannonades.

Mr. Edward Powers petitions Congress to authorize a series of experiments to produce rain by artificial means, during dry seasons. This,he pointsout, may be accomplished by the firing of heavy artillery. In back numbers of the SCIENTIFIC AMERICAN, we have given many specific examples of rain storms which have followed heavy cannonades. in connection with various battles, during the late rebellion and European combats. There is reason to believe that the concussions of artillery, when sufficiently long continued, may have a condensing or aggregating effect upon the serial vapors, and so induce the fall of rain. When the national debt is paid, or specie payment resumed, we think it might be well to burn some public powder as suggested by the makers being permitted. The joint exclusively adopted is present petitioner. But we move that the experiments be

A Chance for Investors.

The attention of parties desiring to invest in patents is directed to the announcement of Messrs. F. A. Hull & Co., manufacturers of the Danbury drill chuck, published in our advertising columns. This invention was fully described and illustrated on page 214, Vol. XXIX. of the SCIENTIFIC AME-RICAN, and is a three jawed lather huck so constructed that all the jaws are simultaneously moved, in radial directions, by the revolution of a single right and left hand screw. The action is direct and positive, and, it is claimed, cannot clog, set, or in anywise get out of order.

We are informed that, since the placing of the article upon the market, it has met with a ready sale, and has given general satisfaction. The owner, desiring to dispose of the patent in order to devote his efforts to a more important enterprize, offers the same at quite a moderate price. Judging from the representations of the manufacturers, we presume that any one, having the requisite capital, will find the invest-

THE ST. LOUIS BRIDGE, -The iron work is now complete, wo weeks in advance of the contract time. A grand banquet has been given by the Keystone Bridge Co., contractors, to their employees, some 200 in number, at the Grand Central Hotel. The approaches will now be hastened to completion, railroad tracks laid, and carriage ways finished as speedily as possible; and the indications are that the bridge will be thrown open to public traffic at a much earlier day than was antici-

Becent American and Loreign Latents.

Improved Stone Pavement,

Andreas Eichenberg, Columbus, Ohio.—This invention is an improvement in stone road beds, and consists in arranging an upper vertical layer with a horizontal layer of flat stones. Both break joints to insure a greater degree of stability of the individual pieces in their normal position. Sand or gravel is used to fill the interstices

Improved Belt Shifter.

Harrison W. Curtis, Philadel phia, Pa., assignor to Joseph L. Ferrell, same place.—This invention consists of an arrangement of the idle pulleys used for turning a driving belt out of a right line for a belt shifter by mounting them on a swinging frame in a line cutting the center of the angle between the two lines in which the belt runs.

Improved Grain Tally.

George P. Fitts, Jacksonville, Oregon.-A carriage moves forward and backward on guide rails between stop pins. A measure is retained in posi-tion on the carriage by pegs, and placed under the spout of the threshing machine, passing under cross bars for equalizing the grain in the same. The attendant moves the carriage in one direction, when one measure is filled, and empties the same while the other measure is filled from the spout. He then moves the carriage back, taking off the second measure when full, and repeats this operation, a registering device keeping a co rect tally of the grain measured off, forming thus a very convenient selfacting apparatus for counting the number of measures.

Improved Thill Coupling.

J. Russell Little, Jamaica Plains, Mass.—This is an improved coupling for connecting thills or a pole with the axle of a carriage. A retainer, which is a small bar of iron, the ends of which work in slots formed in the yoke of an axle clip, when pushed into the forward ends of its slots, comes so far over the hook head of the thill iron as to prevent the said thill iron from being raised from the bolt. The retainer is held forward by a spring, which will allow it to be pushed back when it is desired to attach or detach the thills or pole.

Improved Bobbin Winder for Sewing Machines.

Moses Cook and Moses G. Cook, Ashfield, Mass.—This invention consists of a traverse mechanism for a bobbin winder for sewing machines, in which a drum with a reversing cam groove for working the traversing guide forward and back along the spool has the necessary slow motionimparted to it by a pawl and a friction griping strap. The pawl is worked by an eccentric on the bobbing turning shaft, which receives motion from the sewing machine wheel by a friction wheel. An adjusting screw regulates the extent of the pawl's movements so as to turn the drum fast or slow, according to the size of the threads, and the drum has a friction strap and spring for holding it when released by the griping spring. The bobbin has a spring on its spindle for fastening the thread to it at the beginning. The spool holder has a tension apring to regulate the unwinding of the thread

Improved Combined Gang Plow, Cultivator, and Chopper.

Jonn J. Watrous, West Point, Ga.—This invention has for its object to furnish an improved machine which may be readily adjusted for breaking up and hedding land, and for cultivating and chopping the crop. By suitable construction no tongue is required, which enables the machine to be turned in a very small space, and the chopper is operated by its advance. The chopping hoes may be conveniently adjusted to work deeper or shallower in the ground, as may be desired. The chopper may be easily raised from the ground, and thus prevented from working, and, when not required for use, may be detached. The plows may be adjusted to work shallower or deeper in the ground. Any desired number of plow beams may be used according to the kind of work to be done. Suitable construction also allows the rear ends of the plow beams to have a free vertical movement.

Improved Pitman.
George L. Jones, Vanville, Wis.—This invention consists in a pitman having a side-notched eye at each end, and a collar bushing combined with a pin secured at both ends by a nut. By this construction, a washer and the eye of the pitman can be forced farther upon the pins to take up the wear, by screwingup the nut.

Improved Machine for Making Animal Shoes.

William Hamilton, Fallsburg, assignor to James L. Lamoree, Grahamville, N. Y.—This invention consists of an anvil, trip hammer, and two side hammers, for hammering the shoe on the sides and edges. The anvil is flat on the top, and the hammer has a face which is the same form in outline as that of one side of the shoe to be made, but wider, so as to insure the hammering of the upperside of the blank over all its surface. The hammer is also beveled or inclined to vary the thickness of the shoe and produce the requisite shape for the top. One of the side hammers is shaped in respect of the contour of its face to correspond with the required shape for the outer edge of the shoe; the other is shaped to correspond with the inner edge, and both rest on the face of the anvil, and work toward and from each other to hammer the edges of the blank. These hammers perform their operation while the trip hammer is raised, and then move out of the way when the trip hammerfuls, to give the necessary space for it between them which is required by the greater width of the hammer than that of the blank. The side hammers are operated by the helve of the trip hammer, one being connected directly to an arm projecting from its axis by a rod or shank, so as to be thrown forward when the hammer rises, and the other being connected to the same arm by a similar rod, and an intervening rock lever, by which it is moved toward the other side hammer by the same operation of the trip hammer. A bar is arranged on the trip hammerhelve, to be actedon by the tappet wheel for raising the hammer, which said bar is jointed to the shank, and arranged to swingout of the path of the tappets to throw the hammer out of gear, and into their path to put it in gear

Improved' Adjustable Catch for Latches.

George W. Burr, East Line, N. Y .- This invention is an improvement in the class of catches for door and gate latches, which are made vertically adjustable to accommodate the various positions the door or gate may assume to consequence of shrinkage, swellings, or other cause. The invention consists in combining a T-shaped catch with a slotted holder or guard plate, which is secured to the gate post by screws, so that by means thereof the catch may be clamped and held by friction at any desired point.

Improved Corn Plow.

Jeremiah H. Trout, Kingwood, assignor to himself and Isaac S. Cramer, Sergeantsville, N.J.—The shovel standard is made in two parts and jointed to allow an outward lateral movement to the lower part, with a spring on the outside and alever on the inside. The draftbars, which are attached to the frame and run along through slots in the plow stocks, are connected to the stock by wooden pins, which are prepared, in respect of their strength, so as to break readilyif the plows encounter too great resistance. The stocks are pivoted to the frame, so asto swing back in case the pice

Improved Ice Machine.

Thomas F. Peterson, Macon, Ga.-This invention consists of a boiler, condensing coil and cooling tank, receiver, freezing coil and tank, and numps, all combined and arranged so that the ammoniacal gas expelled from the boiler by heat is compressed and condensed in the condensing coil, and then, after passing through the receiver, is let into the freezing coll. so as to expand therein and freeze the water in the tank by taking up the heat from it. It is then pumped directly into the boiler again for repeating the process, and takes with it the heat obtained in the freezer, and thus utilizes it instead of wasting it.

Improved Tube Welding Machine.

Joseph R. Lemen, Champaign, Ill., assignor to himself and T. G. Lans den, same place.—There is an anvil die and a hammer die for hammering down and reducing the end of the tube to be inserted in the piece to be welded on, or for receiving the ferrule on the end to be fitted in the tube The anvil die has a part of its concave face made on a circle enough larger to equal the thickness of the metal of which the tube is made, so that the mandrel on which the tube is to be hammered, being entered in the end to be reduced, will hold the tube. When hammered by the die. it will rest thereon, so as to be suitably contracted and reduced, and not stretched or drawn out larger, as it would be if hammered on the mandre alone. A shoulder on the under part of the anvil die forms the gage for length. The anvil die and hammer die for welding the tubes together are coucave like the others, but of uniform size and shape from end to end, except a little convexity in the form of the hammer die, and the anvil die is of considerably greater length than the hammer die, to avoid angular indentations in the surface of the tube. They also have a mandrel. The tubes are presented from the right hand sides, and held by the other end in the hand of the attendant, to be turned and shifted about, as required.

Improved Watchmaker's Tray.

Lyman B. Milliken, Saco, Me.-The object of this invention is to furnish for the use of watchmakers a convenient and handy tray, which enables the workman to take down a watch movement and keep the different wheels, each with its corresponding bridge, pins, and screws, separate, so that there is afterward no trouble or delay in putting the movement toge-ther. The invention consists of a concaved tray of suitable shapeprovided with a series of concave indentations, and a central raised part with similar concavity, on which the plate is placed at different stages of the work, while the detached parts are arranged separately around the same.

Improved Seed Planter.

Simeon Smith, Jr., Newburgh, Tenn. - This invention consists in the combination, with a hopper and seed disk, of a beam having a recess filled with compressible material behind a spring, to keep the space full to excoude the grain, and allow the spring to work forward and back, to allow the grain to pass under the pad freely, and prevent any catching and cutting or breaking of the grain.

Improved Die for Forging Hammers.

James R. Lindsay, Chicago, Ill.—This invention consists in a device fo cutting metal formed of two cutter bars connected by straps to a hand lever, and the cutters so shaped that bolts and rods of varying size, shape and configuration may be cut with equal facility.

Improved Knob Latch.

Walter Varah, New Haven, Conn.-A milled head being turned, a sleeve (by its spiral slot, in which is a pin) moves another sleeve inwardly or out wardly, thus throwing a stud into or out of the notch of hub. Thus the spindlemay be connected with or disconnected from the hub that operates the bolt.

Improved Game Board.

Jacob Daring Spang, Dayton, O.-This is a toy race track upon which quite an amusing game may be played, serving, according to the inventor, to illustrate, on a small scale, the spirit and excitement of the turf. The race field track or platform is inclined when in use and surrounded by a mimic fence or enclosure. There is a starting station in which represents tive horses or balls are placed, the horses or balls being severally marked and the number being optional. A bottom hinged gate is held across the outlet by cords which pass through holes in the platform or track. As soon as this gate is depressed the balls will pass out. They will first encounter posts, arranged in transverse rows. the individual posts of two rows not being opposite or in alignment, but each one occupying a median position between the two nearest posts of the opposite row. The balls will be re tarded more or less by the posts, as well as diverted from their course, but will all come to the cross hurdle, which is inclined on the face that is opposite to the starting station. They next will move over this and pass through the three rows of posts to and over a second hurdle. In passing through the next section of the race course, two transverse rows of sta bles or stops will be met by some of the balls, which will be caught and stopped, while others will escape, though interrupted by another inter mediate cross row of posts. They will now pass over another hurdle and more stops and finally reach the goal. Those which succeed in reaching the goal will not, however, arrive simultaneously, but successively, thus enabling the one arriving first to be accounted the winner and to score the highest number or count in the game, while others are allowed a count according to their relative time of arrival.

Improved Gas Stove.

Charles Witteck and William G. Steinmetz, New York city.-The base part of the stove contains four burners, and the draft passages are ar ranged above the same. The burner nearest the supply pipe produces the main draft through the passages, and is, therefore, allowed to burn continually with a full supply of gas, while the supply of the other burners is regulated by a suitable stopcock. A horizontal partition plate separates the lower part of the base from the upper part, which forms with the top plate the combustion chamber. The partition is vertically adjustable in slots. The admission of air to the combustion chamber is accomplished through the perforations along the upper part of the base. The quan tity of air required for the full combustion of the gas is regulated by the higher or lower position of the partition by which the slots are par tially opened or closed. The burners connect with the combustion chamber by pipes which open into metallic extension burners which extend along the side walls of the base. The air slots are provided with narrow slots, through which the blue heating flames of the gas issue. A large air hole is arranged in the base for the admission of a stronger current to the larger casing of the main burner.

Improved Ear Tube.

Henry B. Auchincloss, New York city.—This invention consists of a tube arranged in any seat of a hall, church, or similar public building, and having a funnel-shaped mouth, easily adjustable to suit the hight of the ear of the user. The lower end of the tube is designed to pass down through the seat, and be connected with a tin tube passing beneath the seats or floor, and passing up near the speaker's desk, where it should terminate in a funnel-shaped mouth.

Improved Cam Slide for Sewing Machines.

Andrew Aird and William Randel, Troy, N. Y .- This invention consists of a block of steel or other material on the end of the needle arm which works in the cam groove, so constructed as to slide in the groove as a substitute for the roller commonly used. The block is divided into two separate pieces, whose exterior faces are shaped so as to allow them to slide freely along the varying angles of the cam, and the interior faces are made to permit an independent oscillating motion of each part on the stud of the arm. The invention also consists of a springbetween the blocks to keep them apart to take up the slack that may occur by wear, and cause them to fill the groove at all times.

Improved Lamp.

Bernard Fanta, Milwaukee, Wis.—This invention is a kerosene or petro leum lamp having a weighted sheet metal base, converging, and provided with a flange having a polygonal periphery suspended above the plane, which supports the base of the lamp. This prevents the effect of an over turn by catching upon the table or other subjacent article, just after the center of gravity has passed beyond the base. A rebound is created that throws the lamp back, and causes it to regain its equilibrium, or affords the person who has caused the accident time to seize it before damage is done.

Improved Hoof Trimmer.

David Booker and Cornelius N. Tosh, Palmyra, Ill.—This is an improved hoof trimmer, by which the horse's hoof may be neatly pared on the flat part, cleaned from the dirt, and trimmed at the outer edge, so that the hoof is quickly and fully fitted to the shoe. It consists of a main cutting knife at the end of a strongbar, with handle end. The knife is curved outwardly to a point, and serves with its end for paring and cleaning the hoof while the lower part is used, in connection with a second smaller curved knife, which is pivoted to the larger, and operated by pivoted connecting rods nd hand lever, like shears, for trimming the hoof,

Improved Spring Shank for Boots and Shoes Emil Briner, New York city.—This is an improved spring shank, which s not only stronger at the point of greatest strain, and more flexible at the fore ends, but which may also be adjusted to various degrees of elasticity, as required. Two spring shanks, of equal length and strength, are spread at the front ends, and are connected by a central pivot. Holes are provided at the heel ends for attaching them to the heel and adjusting their front ends without weakening the heel part.

Improved Plow.

Edward Walter, Salisbury, Mo .- The upper part of the standard is bifurcated, the main arm being pivoted to the beam, while the curved backward extending arm passes up through the beam, and is held thereon by means of a nut and washer. The beam is raised or lowered as the nut is and thereby the share elevated or depressed accordingly. The increased strain which the beam has to bear thereby is met by a metallic strengthen ing rod, which is pivoted to the main arm of the standard, and extends

Improved Bag Holder,

Erasmus D. Hix, Payne's Depot, Ky.—This is a bag holder for filling wheat, corn, and other cereals into sacks in the granary; and it consists of a strong supporting standard, in which slides adjustablythe end of the curved steel arms which spread sidewise, and are bent at their front extremities, under suitable angles, into a connecting spring hoop, over which the hem of the bag is attached, and firmly secured by pointed hooks at the front end of the

Improved Organ Coupler.

Charles W. Fossler, Adeline, Ill., assignor to himself and Christian Fossler, same place.—This improved organ coupling device consists of a pivoted platform, to which the coupling arms are attached, bent in such shape that, on throwing the platform up, the keys will come in contact with the arms when depressed, and thereby couple the corresponding pins to those originally depressed by the keys

Improved Grading Apparatus.

Ole Matson, Moline, Ill.—Thisis an improved apparatus for moving earth from one place to another, in grading roads, lawns, etc. The driving shaft evolves in bearings in a frame staked to the ground, and is connected by bevel gearing with a pulley around which passes an endless chain. The chain also passes around a grooved pulley, pivoted to one end of an arm the other end of which has a hole formed through it to allow it to be placed upona post. The other part of the chain is held out of the way by passing around a grooved pulley, pivoted to the end of a bar, upon the outer end of which is formed a hook or eye to enable the end of a rope to be conve niently attached to it. The ropepasses over a pulley pivoted to a bow. which is passed over the end of a screw post. The line is held in placeupor the pulley by a line holder, which consists of a wing pivoted in the fork of a plate, in such a way that the edges of saidwing may shut down against the arms of the plate, and thus hold the said line. The line holder thus holdsthe endless chain in place, and enables any slack to be conveniently taken up. Scrapers, made of a single plate of iron, are provided with hole to receive wooden handles, and with ears to receive the draft chain, which is connected with the endless chain. The scrapers may be filled and emp-tied at any required points of the circuit of the endless chain, and the position of the said chain may be readily shifted by moving the screw posts from one place to another.

Improved Apparatus for Feeding Steam Boilers with Air, Martin E. Bollinger, Littlestown, Pa.-An air pipe leads directly from the feed pump to the boiler through a heating coil surrounding the five, to be used when a steam heater cannot be used, as on locomotive engines. This, with the air feed pipe, is provided with a check valve and stopcock to let off the pressure for a short time when starting. The steam pipe enters the steam dome above the water line. The pipe for the circulation of the water is tapped into the boiler shell, near the smolre stack, below the water level, and into it again at the front above the water level.

Improved Variable Exhaust Valve.

David H. Seamon, New London, Conn.—The valve is in the form of a hollow truncated cone reversed, and is seated on the upper end of a tube. Guide rods, rigidly connected with the valve by means of arms, pass through ears of the tube, and are connected with a semicircle on the end of a lever which extends back to the engine room, so that the valve may be operated by the engineer or fireman, as occasion may require. For producing what is known as a "sharp" exhaust of steam into the chimney, the valve is kept closed, so that all the steam passes through the valve. For a less sharp exhaust, the valve is raised so as to make an annular open ing between it and the seaf. By raising the valve in this manner, the annuar opening is graduated in size to suit the exigencies of the case, the lever being arranged so that the valve may be get and held in any desired posi-

Improved Seal Lock.

Daniel T. Casement, Painesville, O., at present residing at the Fifth Avenne Hotel, New York city.—This invention consists in connecting a push pin and seal punch by a rock lever, so that, when the former is forced in to disengage the hasp, the other will be thrust out through the seal also in constructing the sud of the hasp with a notch of peculiar form corresponding to that of one end of the locking bolt. The fastening is attached to the door by means of a screw bolt, and has a lip fitting over the open end of the card-holding frame. The bolt passes through a slot in the sliding hasp. The frame for confining the seal is provided with ough and jagged notches and points to make it impossible to cut out the cardand then fit in another. A glass seal may be used as well as the paper card, if preferred, and, when used, the seal punch may be dispensed with as the glass will have to be broken to work the push pin: and when the ock is adjusted for the use of the swinging hasp, the mouth will be suitably arranged for allowing the broken pieces of glass to fall out.

improved Device for Checking Herses. Edwin R. Ray,Columbus, Ky.—Two bridle check rein pulleys and a pulley for a hand rein are made in one piece, having through their center a shaft. The ends of the shafts are made fast to the hames, reaching from one side to the other, with the pulleys revolving thereon. The check reins of the bridle are attached, in any suitable manner, to the first bulleys. To the other pulley a hand strap or rein is attached, and is wound around it. The difference in the diameter of the bridle and strap pulleys gives the driver nurchase on the bit, which controls the borse.

Improved Machine for Upsetting Tyres.

Mathias Schon, Englishtown, N. J.—This is a machine for upsetting or shortening wagon tyre or iron bars of other descriptions that may be operated by one man. A stand has one ach side a bar. The sebara support: stationary head and guide a hinged head. The stationary head is also attached to the edge of the stand. These heads are placed crosswise of the bars, each having a flange, against which the adjusting blocks are placed. Gripe jaws, one on each of the heads, have levers, and are connected by the jointed bar which is attached to an operating is w. By working the latter, power is applied to one of the gripe jaws which first strikes the tyre, when the other jaws are also caused to gripe the tyre. The tyre is in a heated state, between the two jaws, and is firmly held, so that it can have no longitudinal motion, by the operator, while, with his left hand, he grasps a cam lever, and forces the movable jaw and head toward the other jaw. This movement causes the jointed bar to turn outward on its hinge and upsets the tyre. The anvil is fastened between the two bars, and the tyre rests thereon. In case it bends upward, it may be forced down with a hammer.

Improved Door Bell.

David Mosman, West Meriden, Conn. - A gong isacrewed upon the end of a standard attached to the door. The standard is made with an offset, and to its angle is pivoted the hammer. The short arm of the hammer projects down into a slot in the shank of the standard, and to its end is pivoted a rod which passes out through the door and has a knob. Upon the inner part of the rod is a nut, which strikes against the base of the bracket to limit the movement of the rod, and thus regulate the force with which the hammer strikes the gong. A washer prevents the said nut from being turned upon the rod, and thus moved out of place by the conaussion.

Improved Gate.

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George C. Crum, Barr's Store, Ill.—This invention consists in a novel and very simple mode of opening a gate from the back of a horse or the inside of a vehicle without alighting or indeed any personal inconvenience

Improved Carriage Curtain Fastening.

John Bannihr and Daniel H. Rhodes, Hempstead, N. Y.-This invention s a fastening for carriage curtains which will hold securely, and is not liable to become accidentally unfastened. Small slotted metallic plates are attached to the curtain at suitable points on the sides and bottom. These slip over buttons which are pivoted to the frame. The latter has a concave outer edge into which the inner rounded edges of the buttons fit, o asto press the curtain down in its place. Securing the button, after the slotted plate is slipped over it, holds the curtain securely.

Improved Universal Joint.

Hiram Pitcher, Fond du Lac, Wis.-This invention relates to apparatus sedfor conveying power and motion by means of rods from the motor to the machinery driven; and it consists in a universal joint formed of a cup piece and a head piece, with intervening rollers. The outer ends of the rollers are made conical, to prevent undue friction. The rollers revolve independently of each other as they are touched by the head, and this allows the two coupling rods to be placed at an angle with each other without increasing the friction. The purpose for which this joint is more especially designed is for connecting horse powers with thrashing machines.

Improved Vebicle Wheel.

Benjamin Pearson and Horace W. Pearson, Newburyport, Mass.-The oint is made so far from the middle of the space between two of the spokes that the end of one segment will be supported by the spoke, and by cutting the ends or making the joint on a bevel, the other segment is caused to act as the key of an arch on the other segment, and be thus supported. While the joint is made beveling, the bolt is passed through at a right angle with the felly, and through the center of the bevel joint. This position of the olt prevents lateral movement of the ends, and obviates the necessity of doweling the ends together.

Improved Shoemaker's Shoulder Tool.

William L. Peters. Oxford, Mass., assignor to Charles I. Rawson, of same place.—This invention consists of a shoulder tool for smoothing and finishing the edges of the sole and the ball edges of the heel, in which file-cut faced disks of hardened steel are combined with the rubbing blade, so as to scrape, smooth, and finish the edges at the same time the rubber is used. The disks are adjustably attached to be shifted around as they wear dull, and several disks of different thicknesses are constructed alike, so as to be interchangeable for soles of different thicknesses.

Improved Mechanism for Actuating Punches

Warren Lyon, Mamaroneck, N. Y.—This invention consists in a wheel provided with radial notches in the side of its rim, a lever provided with a projection upon its side, fitting into said notches, and a loose collar, in ombination with the gearing by which the machine is operated. By operating the lever the wheel is turned in either direction, which gives motion to the gearing. The peculiar construction of the lever and notched wheel enables the said lever to be readily shifted at the end of a stroke to obtain a new purchase, so that immense power may be applied by a series of ${f euc}$ cessive efforts until the desired effect has been accomplished. This power, when applied to a punching press, enables the punch to be readily forced through a bar five eighths inch thick, oreven thicker.

Improved Operating Mechanism for Hatches. William S. Harris, Brooklyn, N.Y.—This invention relates to the hoisting

and lowering apparatus employed for simultaneous opening and closing a series of hatch covers by a windlass or other power; and it consists of the rope, chain, rods, or other device employed for connecting the hatch covers to the power apparatus, extended directly from one cover to another, from the topmost downward, and passing through a notch or eye in them, of peculiar construction. There is a knot above and below the covers, to prevent the rope from running through the eye without effect, said knots being placed such a distance apart as to allow of such little play of the rope as may be needed to each cover. The object is to simplify the arrangement and cheapenthe cost of such apparatus.

Improved Log Turner.

William E. Hill, Erie, Pa.-This is an improved log turner, which is applied to the log, and the rolling motion of the log is produced by the continuous motion of the spur wheels without tearing or injuring the same, while allowing at the same time the immediate interruption of the rolling. and the placing in position of the log for sawing: the rolling mechanism is then carried back to rest on the supporting frame out of the way of the saw. Wheels with pivoted spurs are provided for simultaneously raising and rolling the log, which wheels are keyed fast to a shaft turning in bearings of a shield-like frame, which incloses the gear wheels and brake mechanism of the log turner. The casing, with its spurred wheels, is supported on a supplementary cushioned frame and thrown into gear with the driving power by suitable lever mechanism, which carries the wheel up toward the log. The brake is applied by a yoke with eccentric, band, and lever connection to the upper wheel, its lever serving the twofold purpose of operating the brake and forcing the log into exact position for the saw on the carriage, and throwing the log turner into gear.

Improved Music Leaf Turner. George Sweatt, Lebanon, N. H.—This invention consists of fingers, for

curning the sheets, provided with a circular toothed base, and arranged, one above another, on a vertical pivot in a chamber, in or below the music board, along which a toothed bar is made to slide for throwing the fincers, said bar having a row of teeth for each finger arranged to operate them successively. There are foot treadles, for sliding the toothed bar forward and backward with pulleys, to be turned by them, and cords connecting said pulleys with the bar to move it by being pressed on them, one treadle andpulley being to pull the bar to the right, for turning the leaves from right to left, and the other being to turn them back again, when it may be required to do so. The music rack is adjustable forward and backward relatively to the fingers, for turning the leaves, and is held up to them by springs, so that the leaves between are always held in the proper relation to the fingers, whether the book be thick or thin.

Improved Portable Fence.

James M. Wallis, Rocky Comfort, Mo.-This is an improved stay for fences. One brace is set in an inclined position and extends to the top of the fence. The foot brace, the lower end of which rests upon the ground, is attached to the other brace, near its middle point. To the braces are attached vertical bars. When the stays are applied to a rail fence, the foot the fence at the proper distance from the ground. In this case two vertical bars are used, and the ends of the rails of the adjacent panels are placed upon each other alternately. The top rails are placed above the brace first mentioned, a block being notched and fitted into the space between the brace and vertical barfor the ends of the top rails to rest upon.

Improved Dumping Wagon

Charles Campbell, Cambridge, Wis.—The hind part of the bottom is sttached to a roller, suspended under the box sides. The front end rests on a cross barf setened to the box sides, and the rear end is held up by a hook. The hounds of the hind truck are fastened to the cross bar. The fore part of the bottom is attached to another roller suspended under the box sides. and rests at the rear end on the reach. This reach is connected to the cross bar, so as to be detached when the load is to be discharged to let the hind end of the fore part of the bottom down. The connection is made by a stanls which nasses up through the bar so as to be fastened by a long rod which slides in from the side of the wagon box, so that it can readily be put in and taken out.

Improved Apparatus for Puddling Iron.

Joseph Davies, Knoxville, Tenn.—This invention consists of two pudding tools, one revolving and the other having a reciprocating motion within a rotary furnace. It is believed that, by the rotation of the hearth in this manner, the pudding toolson be worked by powerin a simple way because the iron is brought to them by the hearth; and by using power driven tools, the puddler's labor is much lessened.