

engaged by said spring-catch of the overflow, a check-valve therein and a lever for said check valve under the control of the cam of the steam inlet-controlling valve lever, substantially as and for the purpose described. 9th. The combination, in an injector, of a perforated or ported base or diaphragm for the combining or mixing tube, and an annular valve or plate automatically opening or closing such perforations or ports, substantially as shown and described. 10th. The combination, with the steam inlets and ports *j*, *m* and the lifting and forcing tubes *z* and *p* respectively, of the steam valve *r* having the single opening *q* for ports *j*, *m* controlling such ports independently of one another, and operable with relation thereto to admit of the grading of the water-supply, and also the conversion of the machine from a lifting to a non-lifting injector and *vice versa*, substantially as shown and described. 11th. The combination, with the overflow, of an automatically seated check valve, a lever to unseat or open the same, and the live-steam valve-actuating lever operating in connection with said check-valve lever, substantially as shown and described. 12th. In an injector, the steam chamber *d*, the valve *g* therein, the suction chamber *e* with which the steam chamber communicates through the lifting jet tube *f*, under control of the said valve, the combining tube *h* aligned with the said lifting jet tube *h*, the overflow chamber *m*, the over-flow-cock *o* therein, provided with the valve *q* having automatic play on its stem, and also by said stem adapted to be positively operated to close said overflow, all combined and arranged to operate substantially as shown and described. 13th. In an injector, the steam chamber *d*, the valve *g* therein, the suction chamber *e* with which the steam chamber communicates through the lifting jet tube *f* under control of the said tube, the forcing jet tube *j* in the supply chamber and communicating with the steam supply with an interposed valve *k*, the combining tube *h* having ports *l* in its base or flange to open communication between the suction and overflow or exhaust chambers, and the overflow *q* having an automatic and also a positive operation, all combined and arranged to operate substantially as shown and described. 14th. In an injector, the steam chamber *d*, the valve *g* therein, the suction chamber *e* with which the steam chamber communicates through the lifting jet tube *f* under control of the said valve, the combining tube *h* aligned with the said lifting jet-tube, the forcing jet-tube *j* in the supply chamber and, communicating with the steam supply with an interposed valve *k*, the combining tube *h* having ports *l* in its base or flange to open independent communication between the suction and overflow or exhaust chambers, the discharge tube *n* in the suction or exhaust chamber *m* aligned with the fore-combining tube, and the over-flow-valve *q* having an automatic, also a positive operation, all combined and arranged to operate substantially as shown and described. 15th. The combining tube, having the auxiliary ports, substantially as and for the purpose described.

No. 20,470. Circuit-Closer for Electric Alarm. (*Commutateur de Tocsin Electrique.*)

Leo A. Brigel, Cincinnati, Ohio, U.S., 3rd November, 1884; 5 years.

Claim.—1st. A circuit-closer for electric alarm, consisting of the elements following, to wit: flexible board A, two wires P, N, that constitute the terminals of an open circuit of an electric alarm, and which are so attached to the board as to intersect one another at or near right angles, and of which one is held aloof from the other by curved springs C attached to the board, and through orifices *c* in which the said wire is rove, substantially as and for the purposes set forth. 2nd. In a circuit-closer for electric alarm, the combination of the described slit perforated and pan-formed tar-board A, the detached perforated springs *e* and the two electrical arms terminals P, N, of which both are so rove through the slits and perforations of the said board, and one of them through the orifices of the springs, as to intersect one another without contact, substantially as and for the purposes set forth.

No. 20,471. Handle-Turning Lathe.

(*Tour pour Tournier les Manches d'Outils*)

John Hurley, Bothwell, Ont., 3rd November, 1884; 5 years.

Claim.—1st. A hollow mandrel M, provided with a slot L, substantially as shown and described and for the purpose specified. 2nd. The combination of the sleeve G, and plate N provided with slot F, with the stationary collar E and collar O, substantially as shown and described and for the purpose specified. 3rd. The combination of the sleeve G, and plate N provided with slot T, stationary collar E and collar O, with the hollow mandrel M provided with key H, substantially as shown and described and for the purpose set forth. 4th. The combination of the sleeve G, provided with slot T, hollow mandrel M provided with slot L, with the knife or cutter K and screw bolt J, substantially as shown and described and for the purpose specified.

No. 20,472. Carriage Spring.

(*Ressort de Voiture.*)

Christopher C. Bradley, Sprauce, N.Y., U.S., 3rd November, 1884; 5 years.

Claim.—1st. The combination, with a carriage spring having a trunnion at its end and a socket in which said trunnion is seated, of interlocking parts formed respectively on the trunnion and socket and securing the spring and socket together, when these parts are in their normal position, while permitting the parts to be separated upon placing them in an abnormal position, substantially as set forth. 2nd. The combination, with a carriage spring having at its end a trunnion and a projecting ear, of a socket having at its inner end a projecting lip adapted to bear against said ear, whereby the socket and spring are secured together in the normal position of the parts, while permitting the trunnion to be withdrawn from the socket upon placing the parts in an abnormal position, substantially as set forth. 3rd. The combination, with a carriage spring having at its end a trunnion and a projecting ear, of a socket having a closed outer end, and provided at its inner end with a lip bearing against the ear of the spring in the normal position of the parts, substantially as set

forth. 4th. The combination, with a spring having a trunnion at its end, of a socket having a closed outer end, a yielding washer interposed between the ends of the trunnion and socket, and interlocking parts formed on the socket and spring near the inner end of the socket, whereby the latter and the spring are secured together, substantially as set forth. 5th. The combination, with a spring having a trunnion at its end, of a socket having a closed outer end and an internal recess, a lining seated in said recess and interlocking parts formed on the socket and spring near the inner end of the socket, whereby the latter and the spring are secured together, substantially as set forth.

No. 20,473. Permanent Way of Railway.

(*Voie Permanente de Railroute.*)

Fridolph Schauman, London, Eng., 3rd November, 1884; 5 years.

Claim.—In the construction of the permanent way of railways, the employment of stone or concrete sleepers with compressed or prepared cork washer-plates interposed between such sleepers and the rail, the said rail and the compressed or prepared cork washer-plates being secured to the said stone or concrete sleepers by screw bolts and nuts and spring clip plates, the whole arranged and combined as hereinbefore described and illustrated in the drawing hereto annexed and for the purposes set forth.

No. 20,474. Machine for Making Hoes.

(*Machins pour Faire les Hoes.*)

Richard E. Breed, Pittsburgh, Penn., U. S., 3rd November, 1884; 5 years.

Claim.—1st. In a machine for making hoes, the combination, with a clamp for holding and bending the hoe-blade, of a folding device composed of two corresponding portions or dies having a hinge connection and adapted to form the shank or socket of the hoe, substantially as described. 2nd. In a machine for making a shank or socket hoe from a single blank, the combination, with a socket or shank folder composed of two folding parts hinged to a fixed pin, of a swinging clamp for holding the blade of the hoe and folding it to the proper angle with its shank or socket, substantially as described. 3rd. In a machine for making a shank or socket hoe from a single blank, the combination, with a mandrel and a socket or shank folder composed of two folding parts hinged to a fixed pin, of a swinging clamp for holding the hoe-blade and folding it over to meet its shank or socket, substantially as described. 4th. In a machine for making a shank or socket hoe from a single blank, a clamping device composed of two parts having a hinged connection, one of said parts being provided with a sliding former adapted to determine the lines upon which the blank is to be folded, substantially as described. 5th. In a machine for making a shank or socket hoe from a single blank, the combination, with a clamping device comprising a swinging frame having a sliding former provided with a pointed and beveled end of a movable mandrel and a shank or socket folder adapted to be closed around said mandrel, substantially as described. 6th. In a machine for making a shank or socket hoe from a single blank, the combination, with a clamping device composed of two parts having a hinged connection, of a sliding former supported in one of said parts and means for actuating said former, substantially as described. 7th. In a machine for making a shank or socket hoe from a single blank, the combination of a swinging, clamping and binding device adapted to hold a hoe-blade, a sliding former capable of swinging with said clamping device, a folder and a mandrel for forming the hoe shank or socket and suitable operating mechanism, substantially as described. 8th. In a machine for making a shank or socket hoe from a single blank, the combination of a swinging, clamping device for holding the hoe-blade, a former adapted to have a swinging and sliding movement, a movable mandrel and a folding device for forming a shank or socket, said folding device being also adapted to act in conjunction with a portion of the clamping device as a die for folding down the ears of the hoe upon its blade, substantially as described. 9th. In a machine for making a shank or socket hoe from a single blank, the combination of a clamping device for holding the blade of a hoe blank, a sliding former adapted to determine the lines of bend, a mandrel and a folding device adapted to be closed around said mandrel, substantially as described. 10th. In a machine for making a shank or socket hoe from a single blank, the combination of a clamping device, one part of which has suitable guides, a sliding former adapted to be moved along the surfaces of said part, a movable mandrel and a folding device adapted to be closed around said mandrel, for the purpose of forming the shank or socket of the article, substantially as described. 11th. In a machine for making a shank or socket hoe from a single blank, the combination, with a clamping device composed of a trunnioned plate and a slide frame swinging on a common centre of motion, and adapted to hold the blade of the article to be formed, of a movable mandrel and shank folding mechanism, substantially as described. 12th. The combination, with a folding device for forming the shank or socket of a hoe, of a movable mandrel having an articulated extension and a plunger adapted to enter the folder and bear on said extension, for the purpose of forming the shank or socket with the requisite set or crook, substantially as described. 13th. The combination of a slotted table, a slide carrying a plunger, a folding device adapted to clamp the blade of a hoe, a folder adapted to form the shank or socket of such article, and having an opening near its upper end for the reception of the plunger, a hinged and jointed mandrel carried by a pivoted bar and connecting and operating mechanism, substantially as described. 14th. The combination, with a folding device adapted to form the shank or socket of a hoe-blank, of a movable mandrel, a plunger and actuating mechanism, substantially as described. 15th. The combination, with a folder adapted to close around a mandrel having an articulated end, of a plunger entering an opening in said folder and adapted to bear on the said articulated end of the mandrel, so as to hold it back against one side of said folder, substantially as described. 16th. The combination, with a movable mandrel and a folder adapted to close around the same, of a slide carrying a plunger, a movable rod and a bell-crank having one arm connected to the slide and the other arm connected to said rod, whereby the plunger is actuated, substantially