same, and having its lower front portion cut away, and having an inclined recess within its body communicating with the cut away portion, and a trigger working in said inclined recess, substantially as specified.

No. 29,275. Valve Mechanism.

(Mécanisme de soupape.)

Thomson Kingsford, (assignee of John J. Tonkin), Oswego, N Y., U. S., 1st June, 1888; 15 years.

Claim.—The combination, with an ordinary steam-chest and steam-cylinder provided with an ordinary main slide-valve and usual parts, of an automatic throttle-valve and stem moving at right angles to the movement of the main valve, and operated by a governor D1 at right angles to the movement of the main slide-valve, and a frame I1 removably secured to the chest for supporting the throttle-valve, mechanism within the steam-chest, whereby the throttle-valve mechanism may be removed for repairs and the engine remain operative, substantially as set forth.

No. 29,276. Washer Cutter.

(Découpoir de rondelle.)

Charles Wunderlich and Anton A. Tibbe, Washington, Mo., U. S., 1st June, 1888; 15 years.

Claim.—1st. In a washer cutter, the combination of the stock A center B having head $b1$, cross-bar C, adjustable knives E, F and spring H, substantially as described. 2nd The combination, with the stock A, of the center B formed with the head $b1$, and with teeth and pins $b2$, $b3$, the cross-bar C laterally adjustable in the stock A and carrying knives E, F, and the spring H surrounding the center B, between the head $b1$ thereof and the lower end of the stock A, substantially as shown and described. 3rd. The stock A, made in crank form and formed with the foot $a1$ and toe $a3$, the cross-bar C adjustable in said toe and formed with a head c, the knife E vertically adjustable in the head C, the block G adjustable along the cross-bar C, and the knife F vertically adjustable in the block G, in combination with the center B and spiral spring H, substantially as shown and described. 4th. The stock A, made in crank form and formed with a tang or shank a, and the center B placed in the crank portion of the stock, the upper end of the center B fitting loosely in a recess $a2$ of the stock, and its lower end passing through the stock at the lower end, and formed with a head $b1$, upon the face of which head teeth $b2$ and pins $b3$ are formed, in combination with the cross-bar C and knives E, F, carried thereon, and a spiral spring H surrounding the lower end of the center B, substantially as shown and described.

No. 29,277. Felt Boot Protector.

(Protecteur de botte de feutre.)

Edward C Rauch, Monroe, Mich., Harry Saunders, Toledo, Ohio' and Charles H. Saunders, Monroe, Mich., U. S., 1st June, 1888' 5 years.

Claim.—A felt-boot provided, on the line to which the top of the over-shoe comes, with a band having a woolly or furry outer surface, said surface of said band being adapted to present a yielding surface to, and to extend over, the top of said over-shoe to exclude substances from said over-shoe, substantially as shown and described.

No. 29,278. Motor Engine Operated by the Combustion of Liquid Hydrocarbon. (*Machine motrice à hydrocarbures liquides.*)

John J. R. Humes, Camberwell, Eng., 2nd June, 1888; 5 years.

Claim.—1st. For use in liquid hydrocarbon engines, the improved means for mixing the hydrocarbon liquid with air or other gas capable of supporting combustion, substantially as described, with reference to Fig. 4, such mean including a mixing nozzle in which the gas is directed with considerable obliquity across the stream of liquid, as it issues from the extremity of a pipe enclosed within the gas conduit. 2nd. The use, in liquid hydrocarbon engines, of an intermittently acting valve applied to the pipe conveying the liquid to the vapourisor, or mixing apparatus, and operating to intercept the flow of such liquid except when the motor cylinder, or compressing pump is drawing its charge of inflammable mixture. 3rd. In liquid hydrocarbon engines, the improved method of, and means for, rendering the operation of the hydrocarbon liquid controlling valve subject to the action of the governor, substantially as described with reference to Figs. 5 and 6. 4th. In liquid hydrocarbon engines, providing the air inlet to the vapour chamber whence the motor cylinder or compressing pump draws its supply of inflammable mixture, with a self-acting valve, or with means for throttling the passages to the said chamber, such valve or throttle being adjustable or otherwise, substantially as and for the purposes herein described. 5th In liquid hydrocarbon engines where the inflammable charge is fired by electricity, the improved means, substantially as herein described, for making and breaking the electric circuit, the same consisting of an insulated connector mounted on any suitable reciprocating part of the engine, and working in conjunction with two flexible or pivoted arms connected with the circuit. 6th. Operating the valve controlling the exhaust from the motor cylinder of a liquid hydrocarbon engine by means of a reciprocating thrust-rod actuated by an eccentric, or its equivalent, and disconnected from the said valve, the arrangement being such that the proportion of the stroke of the rod communicated to the valve is rendered adjustable, substantially as herein described. 7th. The improved means, substantially as herein described, for rendering liquid hydrocarbon engines reversible, such means consisting of a pair of clutches for working the exhaust valve and firing apparatus respectively, the construction and setting of the clutches, in relation to one another and to the crank, being such that in either direction of rotation the action of the firing apparatus precedes by a proper interval that of the exhaust valve.

No. 29,279. Lantern. (*Lanterne*)

Charles W. Colony, Sandy Creek, N.Y., U.S., 4th June, 1888, 5 years.

Claim.—1st. The combination, with the top globe holder and the support upon which the bottom of the globe rests, of rods secured to the the top holder, and vertically sliding connections, whereby said rods are attached to the globe support, substantially as set forth. 2nd The combination, with the cap provided with a holder bearing against the top of the globe, and the bottom support of the globe provided with coupling links, of spring rods secured to said cap and having their lower ends made vertically movable in the links of the bottom support, substantially as set forth. 3rd The combination, with the top globe holder and the support upon which the bottom of the globe rests, and which is provided with coupling links, of rods attached to said top holder and provided with offsets and stops which engage with said links, and form therewith a vertically sliding connection, substantially as set forth. 4th The combination, with the tubular lantern frame, of a vertically movable top globe holder and a bottom globe support, spring rods attached to the top holder, guide links pivoted to the tubes, and coupling links attached to the bottom support, and connected with the spring rods, whereby the spring rods are deflected or strained as the globe frame is raised or lowered, substantially as set forth. 5th. In combination with the lantern frame, globe support and movable cap, guide links pivoted on said frame, coupling links connecting the globe support with the guide links, and spring rods secured to the cap, and having their extremities sliding in the aforesaid coupling links, and provided with coupling hooks adapted to interlock with the links, for locking the globe between its support and the cap, and having also bearings adapted to engage the links and sustain the cap raised from the globe, substantially as set forth. 6th. In combination with the lantern frame, globe support and movable cap, guide links hinged on said frame at opposite sides of the globe, and arranged with their oscillatory ends toward each other, and pendent spring rods attached to the cap at the sides directly over the guide links and normally inclined outward, and suitable connections between the lower extremities of said rods, and said links, whereby the links are confined in both their depressed and raised positions, substantially as set forth 7th. In combination with the base A, globe support B, tubes T, T, and movable cap C, the links l, l, hinged on the tubes and formed with loops e, the couplings a, b, connecting the support B with the links l, and the spring rods r, r, attached to the cap C and having their lower extremities extending through the loops e, e, and formed with the hooks h and bearings i, substantially as described and shown. 8th. In combination with the base A, globe support B, tubes T, T, and movable cap C, the links l hinged to swing vertically on the said tubes, and formed with the loops e, the coupling links b connected with the links l, and having a bar $b1$ extending across the neck of the aforesaid loop, and the spring rods r attached to the cap and having their lower extremities extending through the loops e, and formed with the hooks h and bearings i, substantially as described and shown. 9th. In combination with the base A, globe support B, tubes T, T, and movable cap C, the guide links l, l, hinged on said tubes to swing vertically thereon, and embracing the same, and formed with loops e and eyes n, n, back of said loops, the coupling links b connected at one end with the globe support, and having the opposite end extending through the eyes n, n, and the spring rods r, r, attached to the cap and having their lower extremities normally inclined outward and extending through the loops e, e, and formed with the offsets or hooks h, h, and bearings i, i, said loops being of a size to allow the spring rods r, r to be moved laterally to throw the hooks thereof out of engagement with the coupling links when in a depressed position, and to hold said hooks in their engagement with said links when in an elevated position, substantially as set forth and shown.

No. 29,280. Automatic Railway Signal.

(Signal automatique de chemin de fer)

Daniel Grant, Bath, Ont., 5th June, 1888; 5 years.

Claim.—1st. In a railway signalling device, the combination of the rocking shaft B, provided with a stop, and a spiral spring C, a rocking lever D, journalled upon said shaft and adapted to turn it in the direction of a train moving towards a point where a signal is required, by means of a projection d and lug b, and provided with a spiral spring C1, a crank B1 at the projecting end of said shaft, a bell cord E connected with said crank, and carried upon posts or other convenient supports, and a bell G adapted to be operated by said cord, substantially as set forth. 2nd. In a railway signalling device, the combination of a rocking cross shaft B, having a stop abutting against a projection and held by a spiral spring C, and provided with a lug b, and a rocking lever journalled upon said shaft, and provided with a projection abutting against the lug b and held thereto by a spiral spring C1, substantially as set forth.

No. 29,281. Snow Plough. (*Charrue à neige.*)

Peter B. Brazel, Cheboygan, Mich., U.S., 5th June, 1888, 5 years.

Claim.—1st. In a snow plough, the combination, with a central supporting beam having bob-sled secured at each end thereof, of a forward adjustable plough mounted in connection with the front bob-sled, substantially as described. 2nd. In a snow plough, the combination, with a central supporting beam having a bob-sled secured at each end thereof, and to suitable side beams, of mould-boards mounted in connection with the said side beams, extension wings hinged in the rear of said mould boards, and a supplemental plough adapted to be raised and lowered, operating in conjunction with the central and side beams ahead of the mould boards, substantially as described. 3rd. In a snow plough, the combination, with a central supporting beam having a bob-sled secured to each end thereof, and to suitable side beams, said beams having mould boards arranged on each side thereof and in connection therewith, of an independently operating plough arranged in front of the said mould boards, and adapted to be raised and lowered, substantially as described. 4th. In a snow plough, the combination, with a central supporting beam having bob-sleds at each end thereof, and side beams supporting adjustable mould boards, of an independently operating