

R₄, and the barrel or core R₁ of the reel may be removed, and the cable payed out from the centre of the coil; 4th. The ammoniacal gas motor, in which the gas is produced from liquid ammonia contained in a cylinder or vessel, surrounded with water and so arranged that the exhaust gas from the engine flows into this water, and either with or without the small rotary engine or propeller working in the same; 5th. In combination with the gas reservoir or holder, the employment of a reducing valve or series of such valves in the feed pipe; 6th. The employment, in combination with the carbonic acid gas holder and engine, of the water tanks or receptacles, and the water admission valve or valves; 7th. The peculiar construction of the reducing valves consisting of the box *b*, slide valve *d*, piston *f*, cylinder *g*, spring *t*, and other parts shown, or the modifications thereof; 8th. The valve, in which the slide *d*, piston *f*, cylinder *g*, spring *t*, and other parts shown, are adapted to serve for regulating the admission of water; 9th. In combination with the motor engines, the employment of a throttle valve controllable by the operator on shore; 10th. The peculiar construction of the throttle valve, which consists of the valve box *l*, valve *m* and rod *m*, piston *n*, cylinder *o*, slide valve *p* in the box *p*, lever *p*₂, and other parts arranged in combination with electro-magnets; 11th. The apparatus for working the rudder or rudders, consisting of the engine and rotating shaft T₁, geared with the rudder stock *u*, connected with an electrical circuit and controllable by the operator at the shore or other station; 12th. The modification of this apparatus for working the said rudder or rudders, consisting of a yoke U₆ fixed on the rudder stock U₁, one arm of which yoke is provided with an anti-friction roller working on a bent spring *u*₁₀, and whose other two arms are connected directly to the pistons of two single acting cylinders, which are connected with an electric cable and controllable by the operator at the shore or other station; 13th. The rods *n*, for indicating the position of the torpedo boat to the operator herein above termed the guide or guiding rods, so attached to the boat that they can be raised or lowered, and which are arranged by means of either of the forms of apparatus shown, or by other suitable devices, in connection with a small engine or cylinder supplied with gas by a valve, which is connected with an electric circuit and controllable by the operator; 14th. Providing a torpedo boat with a double set, or two pairs of side wings, or horizontal rudders H, mounted on shafts or journals I, or otherwise, and adjustable at the outside of the boat; 15th. The provision, in the bow or nose of a torpedo boat, of the firing rod or pin V, fitted to slide through a stuffing box W, and which, when driven inward, completes an electric circuit, and thereby explodes the charge in the magazine; 16th. The construction of a torpedo boat with a detachable magazine A*, so secured to the boat by a rod, or by other means, that when the boat strikes an object, the said magazine is detached and falls and the firing is effected; 17th. The electro-magnetic apparatus consisting of the key board *s*, connected with any suitable battery or generator of electricity, and provided with pole changers, switches, index and other devices, and connected with a cable consisting of a number of insulated wires, carried in and payed out from the boat, and each of which wires is connected with and operates apparatus in the said boat; 18th. The employment of means for sending or passing an electrical current through a wire or wires connected with apparatus on the shore, or wherever the operator may be stationed, and with electro-magnets arranged in combination with a valve on board the boat, which valve regulates or controls motor engines; 19th. The employment, in like manner, of means for providing an electrical current, and passing the same through the shunt and magnets for controlling the operation of the rudder or the guide rods of a torpedo boat; 20th. The apparatus, consisting of the segment U₂, geared in connection with the engine shaft and operated to turn the rudder in either direction by the engine, and the series of points or pins U₃ arranged in combination with the spring U₃, which is enclosed in an electric circuit, and thereby indicates on the key-board the position of the rudder; 21st. The mechanism consisting of the two pole changers *z*₂ *z*₃ geared together, and in combination with the index finger *z*₁ on the key board and other parts; 22nd. The combination, with the rudder stock and segment, of the devices consisting of the springs U₄ and resistance coils arranged at the two sides of the rudder stock, and connected with the electrical circuit, in such a manner that the rudder, when jammed hard a port or starboard, will be stopped without injury to any of the parts; 23rd. The arrangement of the electrical circuit, whereby the firing of the magazine is accomplished, with the two resistance coils and short circuit; 24th. A torpedo boat, or floating or moving torpedo, constructed and provided with apparatus for affecting its propulsion, guiding, or controlling and firing, and which apparatus is controllable by an operator at the shore or other station from which the torpedo is launched.

No. 10,233. Improvements on Apparatus for Feeding Steam Boilers. (*Perfectionnements aux appareils d'alimentation des chaudières à vapeur.*)

Edward Hamer and James Metcalfe, Aberystwyth, and Edward Davies, Llandinam, England, 14th July, 1879, for 5 years.

Claim.—1st. In an injector for steam engines, a two part combining cone whereby the sectional area of the steam and water passage of said cone may be enlarged or contracted independently of the spindle; 2nd. The two part combining cone composed of the stationary part H, and the laterally movable part J, in combination with the casing F and a hand lever or equivalent device; 3rd. A laterally adjustable auxiliary combining cone Q; 4th. The combination of a discharging cone and a laterally adjustable auxiliary combining cone Q, with a laterally adjustable combining cone H J, provided with an annular chamber N, and the additional steam inlet *m*; 5th. A laterally adjustable combining cone H J, in combination with a laterally adjustable auxiliary combining cone Q; 6th. The combination of the laterally adjustable cone H L and the vertically adjustable cone D; 7th. The combination of the vertically and independently adjustable steam cone and spindle, and the laterally adjustable combining and auxiliary combining cones and the discharging cone; 8th. The combination, with the injector, the reservoir S and connecting pipe R, of a blast pipe, provided with suitable means whereby the volume of exhaust steam admitted to said reservoir and injector may be regulated; 9th. The blast pipe having a perforated head, in combination with the perforated out off plate O, constructed in such manner that the perforations in the latter may be made to register with those in the former, the steam reservoir S, connecting pipe R and the injector; 10th. In an injector specially adapted to be worked with exhaust steam, the combination of the spindle C, steam cone D, combining cone H J and its chamber N, auxiliary combining cone Q, additional steam inlet *m*, a discharging cone, steam inlet A, water branch G and over-flow pipe.

No. 10,234. Improvements in Direct Acting Engines and Drilling Apparatus. (*Perfectionnements aux machines à action directe et aux appareils à percer.*)

Henry Richman and Uriah K. Arnold, San Francisco, Cal., U.S., 14th July, 1879, for 5 years.

Claim.—1st. The screw threaded tripod legs E₁, and the adjusting threaded sleeves F₁ receiving the legs E₁ into their upper ends; said sleeves having their lower ends pointed to rest upon the ground, together with the lock nuts H₁, to secure the adjustment; 2nd. The clamps C₁, fitted to receive the trunnions, and having a slotted extension which fits into the head I₁ of the legs of the tripod, said head being provided with a single screw by which the clamps are secured to the legs and to the trunnions at one operation; 3rd. The case B, fitted to receive and support the independently rotating driving cylinder C, said case having the threaded sleeve or nut H₁ secured to one side to receive the screw F, which is journaled upon the trough or carriage A, so that the case and cylinder may be moved forward and back without reference to the action of the cylinder or piston; 4th. The cylinder receiving and holding case B, with its removable head D, provided with the pawl T, together with the cylinder C, sleeve Q, having the curved slots R, and the ratchet S; 5th. The tapering slotted clamping screw A₁, which is formed to receive the drill, and to hold it by being screwed into the end of the piston rod, of which it then forms a part; 6th. The piston with its extension W, fitted to receive the drill clamp A₁, and having screw threads cut upon the outside, so that the collar X may be screwed up or down upon it to adjust the position of the lugs upon said collar with reference to the curved slots in the sleeve Q, and the holding key Z; 7th. The extension O of the cylinder with its straight slots P, together with the sleeve Q, with its curved slots R, and the collar X, with its lugs Y, whereby the drills is rotated while being reciprocated; 8th. The extension O with its straight slot, and the sleeve Q with its slots R, formed with an increasing curve, together with the adjusting collar X, with its actuating lugs Y, whereby the amount of rotation may be regulated and adjusted; 9th. The cylinder C, with its piston V, provided with the ingress and egress ports, and the valve *g* working concentrically within the piston and in the same direction; 10th. The piston V, with its contained actuating valve reciprocating within the cylinder C, said piston being provided with ports *h* *a* *o*, whereby both piston and valve are caused to move in the same direction; 11th. Forming the valve within the piston and concentrically with the cylinder, enclosing case and guide or trough, whereby the drill forming an extension of the piston rod is rotated with the cylinder within its case; 12th. The cylinder or case A₄, with its axially moving hollow piston B₄, in combination with the valve G₄, moving within the piston and in the same direction with it, and the supply and exhaust ports; 13th. The improvements in dental engines or mallets, consisting in the hollow piston or mallet B₄, moving axially within the case A₄, and containing the controlling valve G₄, which moves in the same direction with the piston, together with the ports H₄, valve surrounding spaces *a*₂ *a*₃, and the passages *c*₂ *c*₃, and exhaust ports K₄ L₄; 14th. The hollow piston or mallet B₄, moving within the cylinder A₄, and containing the valve G₄, moving in the same direction with the piston, in combination with the stem P₂, with its head O₂ and the spring R; 15th. The hollow piston or mallet B₄, moving longitudinally within the case A₄, and provided with the longitudinally moving valve G₄, in combination with the stem P₂, with its transverse pin T₁, and the slotted guide Q₁; 16th. In a dental engine, the piston or mallet B₄, moving within the cylinder A₄, so as to give successive blows upon the head of the stem P₂, in combination with the elastic spring and air tight packing R₁, to return the stem after a stroke and prevent leakage from the cylinder.

No. 10,235. Machine for Ripping, Surfacing and Matching Lumber. (*Machine à refendre, raboter et appareiller le bois.*)

John DuBois, Williamsport, Pa., U.S., 14th July, 1879, for 5 years.

Claim.—1st. In combination with a ripping and surfacing machine A, and a duplex matching machine B, intermediate devices such as shown, to facilitate the feeding of the strips from the first machine to the second; 2nd. The rests C C₁ D D₁ E, arranged in connection with the ripping, surfacing and matching machine; 3rd. The combination of a multiple ripping and surfacing machine, a duplex matching machine, and devices constructed and arranged as shown, to enable a single attendant to feed two strips at a time, from the first machine to the second; 4th. In a series of laterally adjustable ripping saws mounted on a common shaft, a separate independent surfacing head or cylinder, and feeding devices, adapted to pass the boards to the saw and surfacer successively; 5th. The combination, in one machine, of the series of saws and their adjusting levers, the surfacing cylinder H and endless bed *w*, arranged for joint operation on the lumber; 6th. In combination with the surfacing head or cutter extending entirely across the machine, the two independent press rolls *p* *p*₁, arranged as shown, whereby the machine is adapted for surfacing simultaneously two boards of different thicknesses; 7th. In combination with the series of ripping saws, the guides *c* and the two arms *d*, with their levers C and the rack bar *f*; 8th. In combination with the laterally adjustable saws *g*, and their adjusting levers *i*, the rack bar K, and adjustable gate *l*; 9th. In combination with the endless slatted bed, having central teeth *b*₁, under the ends of each slat, the driving pulleys or wheels *b*₂, having their teeth arranged to act singly and centrally under the ends of the slats, against the teeth *b*₁; 10th. In combination with the laterally adjustable saws and their adjusting levers *i*, the indicator arm or plates, attached to the levers; 11th. In a wood planing or surfacing machine, the combination of an endless slatted bed *w* and supporting wheels or rolls, with fixed guides C₁, arranged to receive and sustain the ends of the slats on their front faces, for the purpose of preventing the corners of the slats from marking the lumber; 12th. In combination with the bed *w* and wheels *b*₂, constructed in the peculiar manner shown, the fixed guides C₁ *d*₁, arranged to bear on the front and rear sides of the slats; 13th. The cutter head consisting of two or more concentric grooved disks and one or more cutters secured by the grooves of the disks, and curved on the outside in the arc of a circle concentric to the disks; 14th. In a duplex matching machine, the combination of a transverse shaft L, provided with matching heads or cutters *h*₁ *h*₂, on opposite ends, and a second shaft M, provided with corresponding heads K₁ K₂, mounted in a vertically adjustable head N; 15th. In combination with the uprights O, provided with the toothed bars O₁, the vertically sliding shaft carrying head N, provided with the sliding locking bolts O₂.