making and breaking the circuit and a suitable source of electricity, the whole being arranged to operate substantially as specified. 2nd. The two instruments located respectively at two extremities of a line circuit, and each consisting essentially of suitable mechanism for rotating their respective main shafts, a metallic drum or wheel also rotated by said mechanism having a portion of its periphery formed of, or provided with insulation, for the purposes described, a current conducting pin or stud located upon the periphery of said wheel, at a certain distance from the insulation, two contact-brushes or equivalents, normally bearing at relative and different points upon the said drum or wheel and included in an electrical circuit, and electro-magnet also included in the said circuit, a pivoted reciprocating lever carrying the armature of the electromagnet and adapted to obstruct the path of the before mentioned current conducting pin or stud, when in its normal inactive position, and the electrical connection within the said instruments, in combination with the line circuit, means for making and breaking said circuit and a suitable source of electricity. 3rd. The two instruments or motors respectively located at two extremities of a line circuit and each consisting essentially of suitable mechanism for rotating their respective main shafts, a speed governor for controlling the speed of said main shaft, a metallic drum or wheel also rotated by said mechanism having a portion of its periphery formed of or provided with insulation, for the purpose described, a current conducting pin or stud located also upon the periphery of said wheel at a certain distance from the insulation, two contact-brushes or their equivalents, normally bearing at relative and different points upon the said drum or wheel and included in the electrical circuit, an electromagnet also included in said circuit, a pivoted metallic reciprocating lever carrying the armature of the said electromagnet and adapted to obstruct the path of the before mentioned current conducting pin or stud, when in its normal inactive position, and the electrical connections within the said instruments, in combination with an electrical line circuit, means for making and breaking said circuit, and a suitable source of electricity. 4th. The combination of two wheels or drums, each mounted upon and insulated from a rotating shaft, and each having a portion of its periphery provided with insulation, two metallic pins or studs secured respectively upon the peripheries of the said drums or wheels, two pairs of contact-brushes or their equivalents, bearing respectively in pairs upon the drums or wheels at different points, two electromagnets located each in proximity to its respective armature, two armatures respectively affixed to two reciprocating pivoted levers, two reciprocating metallic pivoted levers adapted each to normally obstruct the path of each of the current conducting pins or studs, the respective electrical connections, means for making and breaking the circuit, and a suitable source of electricity, as shown and described. 5th. The combination of the metallic drum or wheel mounted on, and insulated from a rotating shaft, and having a portion of its periphery formed of insulation, a metallic pin or stud secured at predetermined point upon the periphery of the said drum and wheel, the shaft, means for rotating same, the contact-brushes bearing normally at relative and different points upon the said drum or wheel, an electromagnet, a pivoted reciprocating metallic lever carrying the armature of the said electromagnet and adapted to normally obstruct the path of the metallic pin or stud, the electrical connections, the circuit and a circuit-closer, as specified. 6th. The combination of the train of wheels actuated by a suitable motive power, the main shaft of the motor provided with a universal joint, for the purpose described, an adjustable speed governor arranged to control the rate of speed of the said motor shaft, and the electro-mechanical devices for intermittently arresting and correcting the speed of the main shaft and its actuating mechanism, substantially as shown and specified. 7th. The combination of an electromagnet in circuit with its armature, and armature pivotally supported opposite to its electromagnet, a pivoted reciprocating metallic lever carrying said armature and provided with suitable retracting spring, a drum or wheel having a portion of its periphery formed of insulation and provided with a metallic projecting pin, said wheel or drum being in circuit with a source of electricity through a suitable device for making and breaking the circuit from said source, the two contact-brushes normally bearing at relative and different points upon the periphery of said drums, means for making and breaking said circuit and the circuit, as specified. 8th. The combination of the two motors, of the construction, substantially as described, and located respectively at separate extremities of a line circuit, and each having a clock-work mechanism operating by a weight, or its equivalent, a speed governor, a main shaft provided with a drum having a portion of its periphery formed of insulation and provided with a current conducting pin at a relative distance from said insulation, the contact-brushes bearing normally at relative and different points upon the main drum, and two electro-mechanical devices, such as shown, for synchronously controlling and automatically correcting the relative speed of said motors with a line circuit, and means for making and breaking said circuit, as specified. 9th. The combination, with an insulated drum or wheel having a piece of insulation located upon its periphery, of a current conducting pin located also upon the periphery of said drum or wheel at a relative distance from the said wheel or drum, at a relative distance from the insulation, mechanism for normally rotating said drum or wheel, two contact-brushes bearing normally upon the periphery of said drum at relative and different points and out of line with the current conducting pin, the electro-mechanical auxiliary escapement devices, the circuit and a suitable source of electricity, as specified.

No. 27,706. Machine for Drilling Rock.

(*Machine à percer le roc.*)

Eugene Moreau, Philadelphia, Penn., U. S., 3rd October, 1887; 5 years.

Claim.—1st. In a rock-drilling machine, the combination of the inclosing case F, the gates H, the sleeves E in which said case can slide freely, the strap D in which the sleeve E and, with it, the case F containing the entire drill-operating mechanism can rotate, the locking device, whereby the sleeve E is held to the bracket C, the clamp B, constructed as described, the revolving hammer frame R, the reciprocating hammers T, the cam rollers U, the crank-shaft M, the bevel-wheel m, m^2 for operating the hammer-frame, the hammer driving-spring t, the hammer locking end releasing devices, the feed-screw N working in the feed-nut G, which latter is adjustably attached to the sleeve E by the latch g, the spring-rod V5, the presser-foot $o13$, and the latch r^6, the drill-socket $o10$, the four-tooth cam $o7$ rotated by the hammer-frame and the hollow-stem V, all operating substantially as shown and described. 2nd. In a rock-drilling machine, the combination of the inclosing case F, the gates H, the hammer-frame R capable of being revolved upon suitable bearings, by means of the bevel-wheel m, m^2 operated by a crank, the hammers T capable of being reciprocated in guides upon the hammer-frame R, by helical springs t^6 and cam rollers U, the spring triggers r^2 for locking and releasing the said hammers, the feed-screw N working in the feed-nut G, the pinion m^4 gearing with the spur-wheel m^5, which in turn is adjustably secured to the bevel-wheel m^2, by spring-latch operated by a rod V5, passing through the hammer-frame and bearing by a presser-foot $o13$ upon the drill-socket $o10$, the said drill-socket being intermittingly revolved by a cam $o7$ actuated by the said hammer-frame when it is revolved, all being constructed substantially as described and for the purpose set forth. 3rd. In a rock-drilling machine, the combination of the feed-nut G, locked to the sleeve E by the latch g, the feed-screw N, revolved by the pinion m^4, which is also connected with the feed-screw N by a spring-latch released when required by means of the thumb-piece $n9$, the said pinion m^4 being in its turn revolved by the spur-wheel m^5, secured to the bevel wheel m^2 by a latch r^6, the said latch being retained in its place by a spring r^9 and released by the rod V5, which passes through the centre of the hammer-frame and bears, at its opposite end, by means of a presser-foot $o13$ upon the end of a tool-socket $o10$, against which it is pressed by a spring v^6, the bevel-wheel m^2, above referred to, being driven by a bevel-wheel m, capable of being turned by a crank, and the whole operating, substantially as described, to feed the drill-tool forward in measure as it penetrates the rock. 4th. In a rock-drilling machine, the combination of the tubular feed-nut locked to the ring in which the case of the machine slides a feed screw bearing in the inclosing case in one end, and at the other end working in said feed-nut, a pinion locked to the feed-screw by a clutch, when automatic feed is not required, and gearing with a wheel which is caused to rotate with the hammer-frame by a latch catching in the bevel wheel which drives the said hammer-frame, the said latch being operated automatically by a rod passing through the centre of the hammer-frame and kept pressed against the tool-socket by suitable springs, the whole operated substantially as set forth, to feed the tool forward in measure as it penetrates the rock. 5th. In a rock-drilling machine, the improved device for regulating the feed automatically, consisting of the presser-foot $o13$ bearing against the drill-tool socket $o10$, and rod $n5$ passing freely through the centre of the hammer-frame held against the presser-foot $o13$ by the spring v^6, and its other end entering a latch r^6, which passes through the bevel-wheel M^2, and locks it to the spur-wheel $M5$, as long as the tool enters the rock fast enough to allow of the distention of the latch-spring r^9 and releasing the said spur-wheel m^5, when the tool, meeting greater resistance, presses by means of the presser-foot and rod v^5 against the latch r^6, compressing its spring and withdrawing it from its notch in the wheel, the whole operating substantially as shown and described. 6th. A supporting device, consisting of the combination of the following parts, a clamp of any suitable construction, provided at one end with a ring B, which has an internal flange b^6, a bracket C to which the machine is attached, and a circular place c held to the bracket C by a pin $c3$ and a bolt c^2, the flange of the said ring B being tightly clasped by the bracket and plate, when the eccentrically-placed bolt c^2 is tightened, substantially as described and for the purposes specified. 7th. In a rock-drilling machine, the combination of the sleeve E in which the tubular inclosing-case F rests and can be fed forward by the feed-screws N turning in the feed-nut G, the said feed-nut G being provided with a locking device for holding it in place, which locking device consists of a lever g pivoted at g^2, and having a notch which fits over the nut and into a groove cut in it, a thumb-latch $g3$ held to g by a pivot $g5$, and provided with a lip $g4$, which can engage with a lip upon the sleeve E, all the said parts co-operating to secure the feet-nut G, so that it can neither be withdrawn nor rotated, all constructed substantially as shown and described. 8th. In a rock-drilling machine, the toothed cam $o7$ rotated by a shaft connected with the main driving gear and itself meshing with the toothed outer circumference of the drill-socket $o10$, the said socket having a polygonal hole for the shank of the drill-tool, in combination with a pawl $o11$, pressed by a spring firmly against the socket $o10$, so that it is stopped after receiving its required portion of a revolution and before the next tooth comes in contact with the succeeding tooth of the cam $o7$, thus preventing the transmission of shocks injurious to the working mechanism of the machine. 9th. In a rock-drilling machine, the combination of hammers capable of being reciprocated by suitable springs and cams in a frame, which can be revolved by suitable mechanism about an axis parallel with the axis of the hammers, with spring triggers bearing friction rollers at their ends, the said triggers being pivoted to a drum attached to the revolving hammer-frame and pressing at one of their ends into notches in the ends of the hammers, and at the other ends bearing against pivoted levers or pawls upon the face of the drum, which levers or pawls are in turn forced against the triggers by being brought, in the course of the rotation of the machine, against a cam affixed to the inclosing case of the machine, all substantially as shown and described and for the purpose set forth. 10th. In a rock-drilling machine, a loosely-fitting helical spring bearing at one end against a conical internal support or thimble upon a stem of the reciprocating hammer, and also at the other end bearing upon a like thimble secured to the revolving hammer frame opposite the end of the hammer, in combination with the said hammer-frame and hammers, all constructed substantially as shown and described. 11th. In a rock-drilling machine, a hammer reciprocating in a revolving frame by means of a helical driving spring surrounding a stem forming a part of the hammer, the said spring being compressed by cams upon the stationary frame of the machine and upon the hammer, which is itself rotated about an axis parallel, but not coincident with its own axis by a crank and intermediate gearing, in combination with a pivoted and spring-actuated