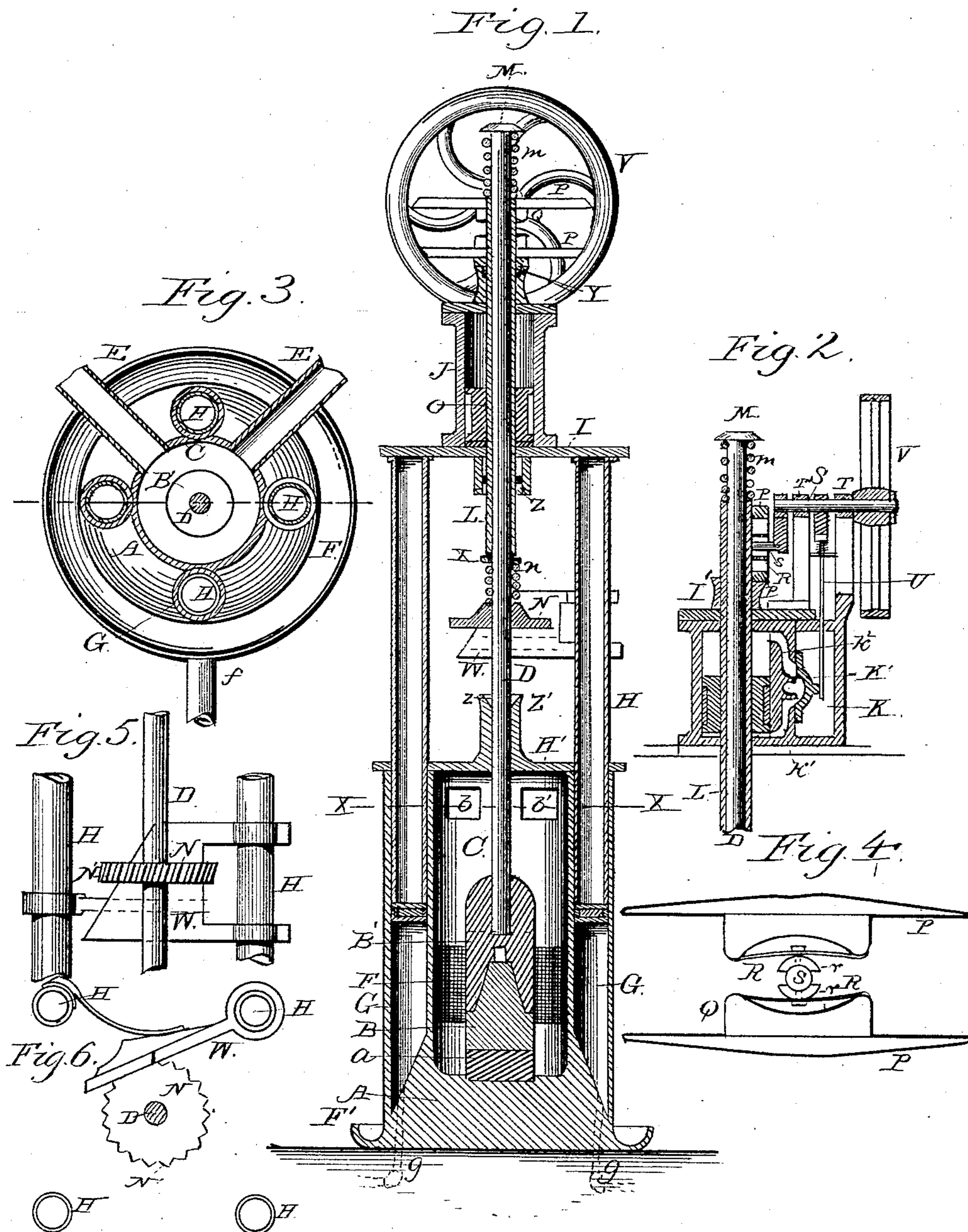


(No Model.)

G. OSTROUT.
ORE STAMPING MACHINE.

No. 328,153.

Patented Oct. 13, 1885.



WITNESSES:

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GEORGE OSTROUT, OF MONTREAL, QUEBEC, CANADA.

ORE-STAMPING MACHINE.

SPECIFICATION forming part of Letters Patent No. 328,153, dated October 13, 1885.

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To all whom it may concern:

Be it known that I, GEORGE OSTROUT, a citizen of the Dominion of Canada, residing at Montreal, in the Province of Quebec, Canada, have invented new and useful Improvements in Ore-Stamping Machines, of which the following is a specification.

This invention relates to ore-stamping machines which employ a stamp having both a rectilinear and an axial motion.

The nature of said invention consists, partly, in the combination of the stamp-rod with a sleeve adapted to move endwise thereon, but engaging said rod at the ends thereof, a piston carried by said sleeve, a cylinder in which said piston travels, a steam-chest for supplying steam to each end of said cylinder, and devices operated by said sleeve for actuating the slide-valve of said steam-chest.

The nature of said invention further consists in the combination, with the foregoing elements, of springs interposed between the ends of the sleeve and collars on the shaft to lessen the jar of the upward and downward strokes.

The said invention further consists in the combination of the sleeve, actuated as aforesaid, with a crank pin and shaft operated thereby, said shaft being connected by a pitman with the slide-valve.

The said invention further consists in a slotted block sliding laterally in guideways attached to said sleeve, in combination with the crank-pin turning in said slot and springs interposed between said block and said pin, for purposes hereinafter set forth.

The said invention finally consists in certain additional details of construction and combination hereinafter particularly set forth and claimed.

In the accompanying drawings, Figure 1 represents a vertical section through the machine embodying my invention. Fig. 2 represents a detail vertical section through the upper part thereof at right angles to the plane of Fig. 1. Fig. 3 represents a horizontal section on the line *xx* of Fig. 1. Fig. 4 represents an enlarged detail view of the block, guides, springs, and crank-pins. Figs. 5 and 6 represent detail views of the ratchet-wheel and one of the spring-pressed pawls, the for-

mer being a plan view and the latter an elevation.

A designates the mortar or anvil, which, as shown, forms the base of my machine, or may be rigidly attached thereto, a die, *a*, being secured to the recessed upper part of this mortar. The said die receives the strokes of a stamp-head, B, and its shoe B', the stamp-head, shoe, and die being surrounded and covered by a casing, C, which is provided at top with a central opening, through which the stamp-stem or stamp-rod D moves up and down. In the upper part of this casing are two feed-openings, *b b'*, through which the feed-spouts E discharge ore to the interior of said casing, to be acted on by the stamp and die. The lower part of said casing is provided with screens F, through which the comminuted ore passes therefrom to an encircling-trough, F', and a discharge-spout, *f*. On the said mortar or anvil as a base four tubes, G, are erected, each of which is provided with a water-inlet, *g*. In said tubes slide four smaller tubes, H, which are fitted watertight at their lower ends and have a strong plate or head, I, secured to their upper ends. These upper tubes pass through and are braced and guided by a similar plate or head, H', which forms the top or cover of casing C, but is enlarged to allow the attachment of the upper ends of tubes G, which, with said casing, support said head H'. The plate or head I supports the steam-cylinder J, which is vertically arranged, and also the steam-chest K, which is provided with a slide-valve, K', and with two ports, *k' k''*, communicating, respectively, with the upper and lower ends of the cylinder. The stamp-rod D extends up through said plate and cylinder, and so, too, does a longitudinally movable-sleeve, L, which encircles said rod. At the upper end of said rod is a fixed-collar, M, and on said rod, below the lower end of said sleeve, is a fixed ratchet-wheel, N. A spiral-spring, *m*, is interposed between the upper end of said sleeve and said collar M, and another spiral spring, *n*, is in like manner interposed between the lower end of said sleeve and said ratchet-wheel. Said sleeve is provided within said cylinder with a piston, O, which is driven alternately upward and downward by the steam introduced

through ports k' k^2 . The consequent upward and downward motions of sleeve L are communicated to the stamp-rod D through springs m and n , collar M, and ratchet-wheel N. Said springs cushion the force of the upward and downward strokes and prevent injurious jarring. To the said sleeve at its upper end are secured two horizontal bars, P, forming a guideway for a block, Q, to slide therein laterally. This block is centrally recessed or slotted, and provided with internal spring-plates, R, which have semicircular bearing-pieces, r , secured to them. These bearing-pieces receive a crank-pin, s , eccentrically attached to a horizontal valve-operating shaft, S, that turns in standards T, raised on a plate, I', on cylinder J, and connected to said slide-valve K' by a pitman, U, which has an eccentric and yoke attachment to said shaft. By the upward and downward motions of the sleeve L rotary motion is communicated to this valve-operating shaft S, through the medium of said block and crank-pin, and this rotary motion is again changed to vertical reciprocatory motion by the eccentric and yoke aforesaid, and transmitted to the pitman and slide-valve. The aforesaid parts are so arranged that when the piston reaches its lowest point the lower port, k' , is entirely open and the upper port, k^2 , entirely closed. Steam then passes under the piston and raises it, the slide-valve rising at the same time and gradually closing port k' and uncovering port k^2 . The same ports are used both for live steam and exhaust.

The lateral motion of the block Q in its guideway answers the purpose of preventing the crank-pin from binding, and the spring-plates R will yield sufficiently to allow the desired transmission of motion to shaft S by enabling the crank-pin to pass dead-centers, even when the piston does not fully reach the end of its normal travel upward or downward. A fly-wheel, V, attached to shaft S, equalizes the rotary motion of the latter.

The rotary motion of the stamp-rod D is caused by the engagement of the ratchet-wheel N (the teeth N' of which are suitably beveled) with a wedge-faced pawl, W, pivoted to one of the tubes H. The rotation of the stamp-rod by means of a pawl and ratchet caused to engage by the longitudinal reciprocation of said rod is not broadly new; but in this instance the ratchet-wheel is the same device which serves as the lower bearing of spring n . The upper end of this spring bears against a collar, X, which is loose on the stamp-rod. This collar receives the first impact of the sleeve in its downward stroke. The upper end of the stamp-rod D is screw-threaded, and the collar M is correspondingly screw-threaded to constitute an adjusting-nut for the upper spring, m . Similar means of adjustment may be used for the lower spring, n , to regulate the tension thereof.

The stamp-rod D and sleeve L pass through stuffing-boxes Y Z, arranged, respectively, above and below the cylinder, and the head

H' of the casing and pipes or tubes G is provided with a bushing, Z', erected around the central opening of said head. This bushing of course surrounds said stamp-rod, and is extended far enough upward to serve as a brace therefor. It is flared at the top, as indicated at z , to allow a certain amount of play and to facilitate the insertion of the rod.

The telescopic arrangement of the pipes G and H make the machine vertically extensible and contractible at pleasure. To raise the steam-cylinder and devices hereinbefore described for operating the slide-valve and stamp-rod, I force water into the tubes G under the tubes H, the latter in consequence being elevated and carrying the aforesaid parts up with them to the desired point. By checking the influx of water I allow the machine to remain as thus adjusted, and when the water is withdrawn the upper part of the machine will necessarily descend again, thus reducing it as a whole within smaller compass. This water, introduced as aforesaid, will of course lessen the heat caused by compression and friction in addition to the dynamic action above stated.

The rotary motion of the stamp-rod is for the purpose of insuring equal action on the die and thorough comminution of the ore.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination of a stamp-rod with a sleeve sliding freely thereon for a limited distance and communicating longitudinal motion to said rod, a piston carried by said sleeve, a steam-cylinder in which said piston works, and a slide-valve which admits the steam alternately to each end of said cylinder, substantially as shown.

2. The combination of a stamp-rod with a sleeve sliding freely thereon for a limited distance, and springs interposed between, which receive the thrust of said sleeve in either direction and communicate the same motion to said rod, a piston carried by said sleeve, a steam-cylinder in which said piston works, and a slide-valve which admits the steam alternately to each end of said cylinder, substantially as shown.

3. The combination of a stamp-rod with a sleeve sliding thereon for a limited distance, springs which receive the thrust of said sleeve in either direction and communicate the same motion to said rods, a piston carried by said sleeve, a steam-cylinder in which said piston works, a slide-valve which admits the steam alternately to each end of said cylinder, and mechanism through which said sleeve operates said slide-valve, substantially as set forth.

4. The combination of the sleeve, stamp-rod, piston, cylinder, and slide-valve with horizontal guideways attached to said sleeve, a block movable in said guideways, a crank-pin having its bearings in said block, a shaft to which said crank-pin is attached, and intermediate mechanism whereby the rotation

of said shaft operates said slide-valve, substantially as set forth.

5 The laterally-movable block and the springs within the same, in combination with the crank-pin turning in bearings attached to said springs, the shaft to which said crank-pin is attached, the pitman operated by said shaft, and the slide-valve, cylinder, piston, sleeve, and stamp-rod, all arranged, constructed, and operating substantially as set forth.

10 6. The ratchet-wheel N, which serves the double purpose of engaging the pawl for rotating the stamp-rod and receiving the longitudinal thrust of sleeve L and spring n, in combination with said sleeve, spring, and rod, and the operating mechanism, substantially as set forth.

15 7. In an ore-stamping machine, a set of tubes attached to the base thereof and adapted to

receive a supply of water, in combination with the supports of the steam-cylinder and the upper part of the machine, said supports being arranged telescopically within said tubes from above, so that when water is introduced under pressure into said tubes the upper part of the machine will be raised, as set forth. 25

8. A casing for the stamp head and die, in combination with a set of surrounding-tubes, a plate which is supported by said tubes and forms a head for said casing, and the adjustable upper part of the machine, substantially as set forth. 30

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses. 35

GEORGE OSTROUT.

Witnesses:

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