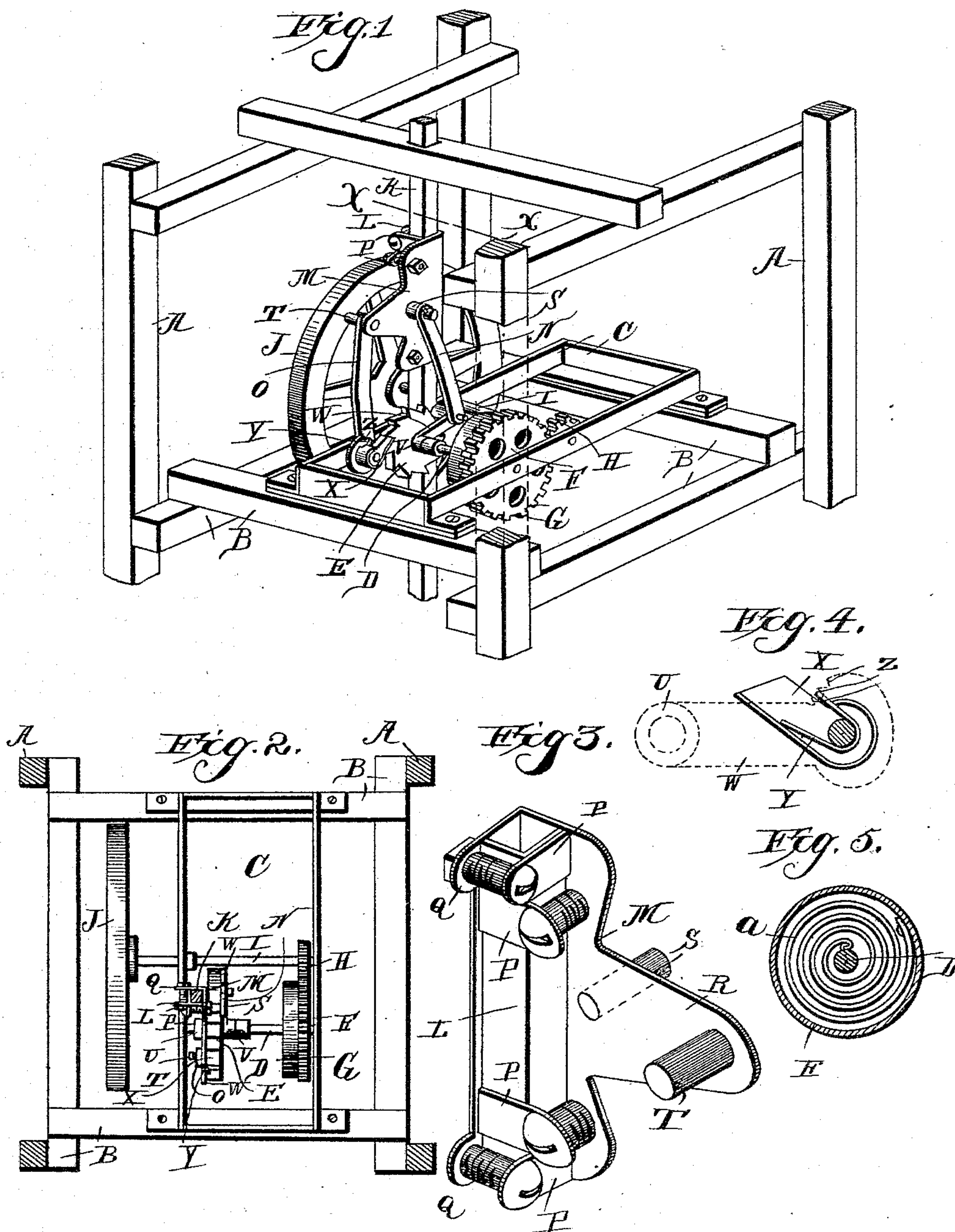


(Model.)

C. E. ARMSTRONG.
DEVICE FOR CONVERTING MOTION.

No. 401,103.

Patented Apr. 9, 1889.



Witnesses.

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UNITED STATES PATENT OFFICE.

CHARLES E. ARMSTRONG, OF NEVADA, IOWA, ASSIGNOR TO JAY A. KING,
OF SAME PLACE.

DEVICE FOR CONVERTING MOTION.

SPECIFICATION forming part of Letters Patent No. 401,103, dated April 9, 1889.

Application filed November 15, 1888. Serial No. 290,890. (Model.)

To all whom it may concern:

Be it known that I, CHARLES E. ARMSTRONG, a citizen of the United States, residing at Nevada, in the county of Story and State of Iowa, have invented new and useful Improvements in Devices for Converting Motion, of which the following is a specification.

My invention relates to improvements in devices for converting motion; and it consists in certain novel features hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a perspective view of a device embodying my invention, portions of the frame-work being indicated as broken away. Fig. 2 is a horizontal section on the line *xx* of Fig. 1. Fig. 3 shows in detail perspective the clamping-plates, which are secured to the reciprocating rod. Fig. 4 is a detail view of one of the pawls. Fig. 5 is a sectional detail view showing the hollow drum and the spring contained therein.

Referring to the drawings by letter, A designates a portion of a suitable supporting and inclosing frame having the horizontal beams B B, to and upon which I secure the open rectangular frame C, as shown.

D designates the main shaft, having its ends journaled in the side bars of the frame C, and having a ratchet-wheel, E, keyed thereon near one end. Near its opposite end this shaft is provided with a hollow drum, F, which is loosely mounted on the said shaft and is provided on its periphery with gear-teeth G, meshing with a pinion, H, on a horizontal shaft, I, journaled in the frame C and projecting to one side of the same, said projecting end being provided with a band-pulley, J, from which the motion is conveyed to the machine to be driven through a suitable belt, as will be readily understood.

K designates a vertically-reciprocating rod or piston mounted in the inclosing-frame A in any desired manner and operated by any suitable means. To this pitman or reciprocating rod at an intermediate point of the same I secure the clamping-plates L M, and to the said plates I pivot the upper ends of pitmen N O. The clamping-plates L M are

L-shaped in cross-section and are adapted to fit around two sides of the reciprocating rod. The edges of the plate L are straight and plain, and from the angle of the said plate project the ears P, the said ears being arranged in pairs at the upper and lower ends of said plate, and the members of each pair projecting past each other at right angles. The plate M is somewhat larger than the plate L, and is provided on its edges with the perforated ears Q, and through these perforated ears and the projecting ends of the ears P on the plate L securing-bolts are passed, so as to bind the said plates firmly around the reciprocating rod, as will be readily understood.

The clamping-plate M is provided at the center of one of its edges with a projection, R, and the upper end of the pitman N is pivoted on a stud, S, projecting laterally from the end of the said projection. The upper end of the pitman O is pivoted on a stud, T, projecting laterally from the clamping-plate M, in opposite direction to the stud S, and in about the same horizontal plane as the said stud S.

U V designate collars, which are loosely mounted on the driving-shaft D on opposite sides of the ratchet-wheel E, and have plates W projecting from their inner ends in opposite directions beyond the edge of the said ratchet-wheel, as shown, the outer ends of said plates being pivoted to the lower ends of the pitmen N O, as shown.

X X designate reversely-arranged pawls, which are pivoted to the sides of the plates W at the outer ends of the same and engage the teeth of the ratchet-wheel E. These pawls are held normally in engagement with the said ratchet-wheel by means of springs Y, having one end bearing against the pawls and the other end engaging one of a series of notches, Z, in the edge of the adjacent plate W. The tension of the springs can be varied, so as to cause the pawls to more or less positively engage the ratchet-wheel by causing its end to engage one or another of these notches.

a designates a volute spring arranged within the drum F, and having one end secured

to the main shaft and its other end secured to the inner side of the rim or periphery of the drum.

The construction and arrangement of the parts of my device being thus made known, it is thought the operation and advantages of the same will be readily understood. Power being applied to the reciprocating rod K, the same is caused to move vertically alternately in opposite directions. On its downward movement the pawl carried by the pitman O will engage the teeth of the ratchet-wheel and impart motion to the said wheel, while on the upward motion of the reciprocating rod the pawl carried by the pitman M will engage the said wheel and move the same, each pawl slipping over the teeth of said wheel when the other engages it. It will thus be seen that a continuous rotary motion is imparted to the said wheel, which motion will be imparted directly to the main shaft D. The spring *a* is so arranged that it winds and unwinds in the same direction, so that when the main shaft is set in motion it will first draw or pull on the said spring so as to rotate the drum, which will thereby impart motion to the pinion H and shaft I, as will be readily understood.

It will be observed that the studs S T are so arranged that the upper ends of the pitmen N O are arranged within the vertical planes of diametrically-opposite points of the edge of the ratchet-wheels, so that the lower ends of the said pitmen will not be arranged beyond the edge of the said wheel, as has been the case heretofore. By this arrangement the pawls are caused to follow the curved path of the edge of the ratchet-wheel during the entire period in which they are acting on the same, instead of moving in a straight vertical line, so as to act on the ratchet-wheel for a short period only, as has been the case with the devices heretofore produced. I thus obtain a continuous rotary motion of the ratchet-wheel with less power than has heretofore been done, as in the previous devices the pitmen either followed the curved path of the edge of the ratchet-wheels or else the pawls moved in a straight line, so as to act on said ratchet-wheels for a short period only, rendering the device rather difficult to operate.

The volute spring in the drum F is very advantageous, for the reason that should the reciprocating rod be driven at a higher rate of speed, or more power than is necessary to rotate the drum, the surplus energy will be expended in winding up the said spring, so

that the said surplus energy will be practically stored up for use in starting the device at a future time or decreasing the labor necessary to operate the same.

The clamping-plates, it will be observed, securely fasten the pitmen to the reciprocating rod, and at the same time protect the said rod and obviate the necessity of cutting away the same and thereby decreasing its strength. The construction of the said plates and the arrangement of the securing-bolts furthermore prevent the said bolts and rod contacting with each other and thereby wearing away the surface of the rod or the threads of the securing-bolts.

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

1. The combination of the main shaft, the ratchet-wheel mounted thereon, the plates W, extending from said shaft and having notches in their edges, the pawls pivoted to said plates and engaging the ratchet-wheels, and the springs having one end bearing upon the pawls and the other end engaging one of the notches in the plates W, as set forth.

2. The combination, with the reciprocating rod, of the L-shaped clamping-plates fitting around the same and provided with perforated ears, the securing-bolts passed through said ears, the pitmen pivoted to one of said clamping-plates, the main shaft, the ratchet-wheel on the said shaft, and the pawls operated by the pitmen and engaging said ratchet-wheel, as set forth.

3. The combination of the reciprocating rod, the main shaft, the ratchet-wheel mounted thereon, the clamping-plates L M fitting around the reciprocating rod, the plate L, having the pairs of ears P, and the plate M, having the perforated ears Q and the projection R, the securing-bolts passed through the ears P Q to bind the clamping-plates around the reciprocating rod, the stud S, projecting laterally from the end of the projection R, the stud T, projecting from the plate M in a direction opposite to the stud S, the pitmen pivoted to said studs, and the pawls operated by said pitmen and engaging the ratchet-wheel, as set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

CHAS. E. ARMSTRONG.

Witnesses:

CHAS. E. SMITH,
I. L. SMITH.