2 Sheets--Sheet 1.

H. KELLOGG.

Metal Rolling Machines.

No. 133,452. Patented Nov. 26, 1872.

Fig. 1.

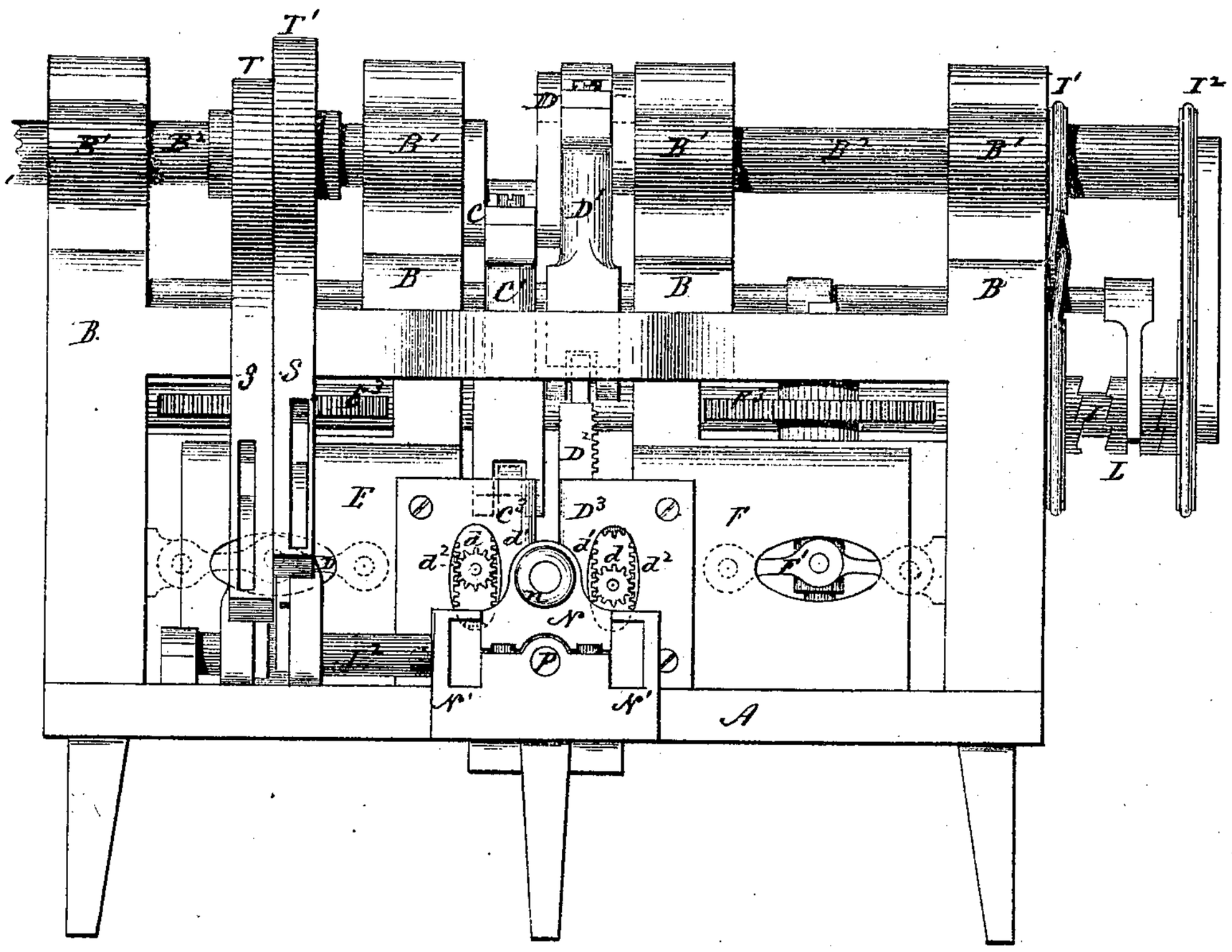
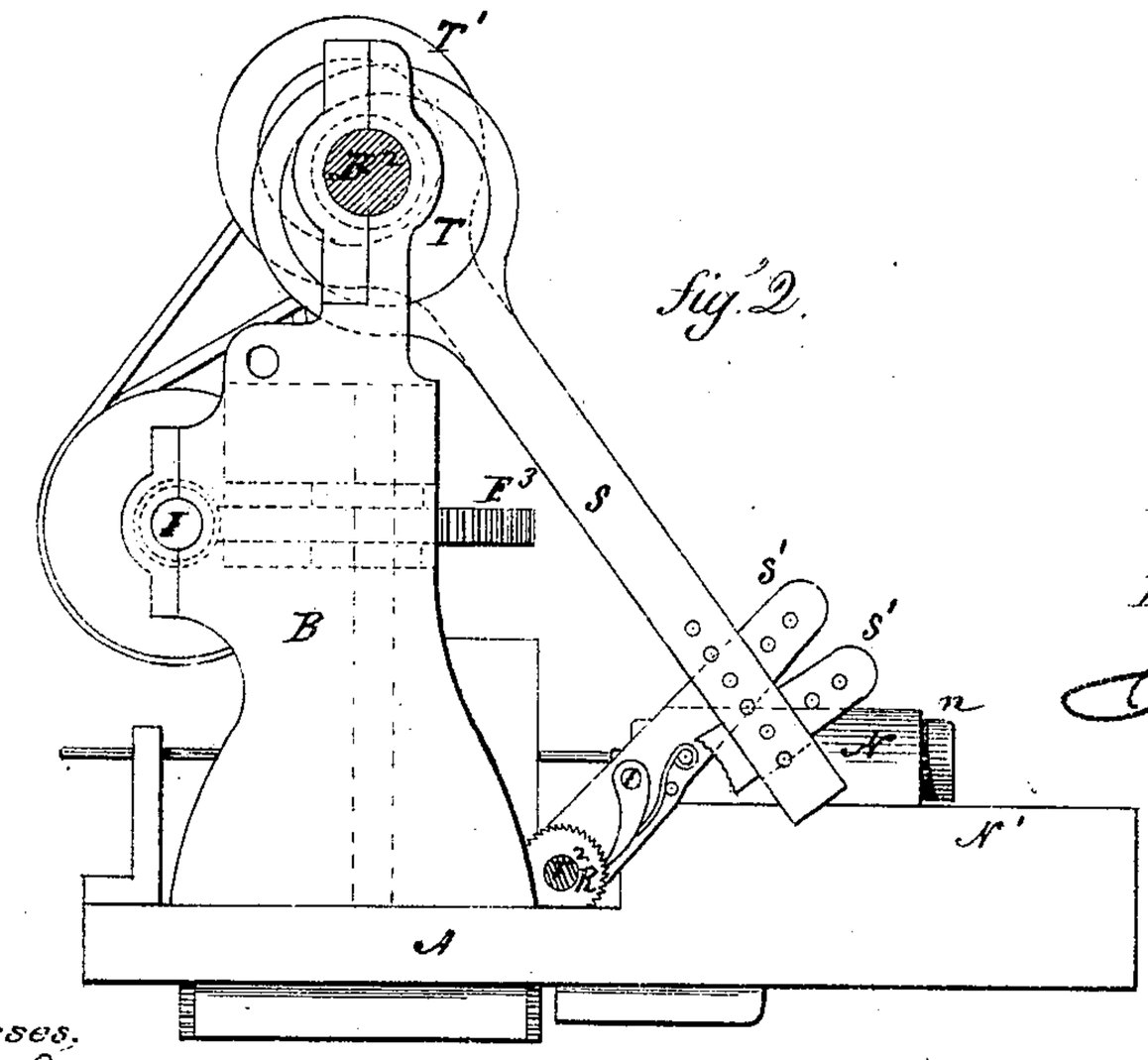


Fig. 2.



Witnesses.
D. H. Shumway
A. J. Tibbits

Henry Kellogg
Inventor.
By his Atty.
John C. Earle

2 Sheets--Sheet 2.

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fig. 3

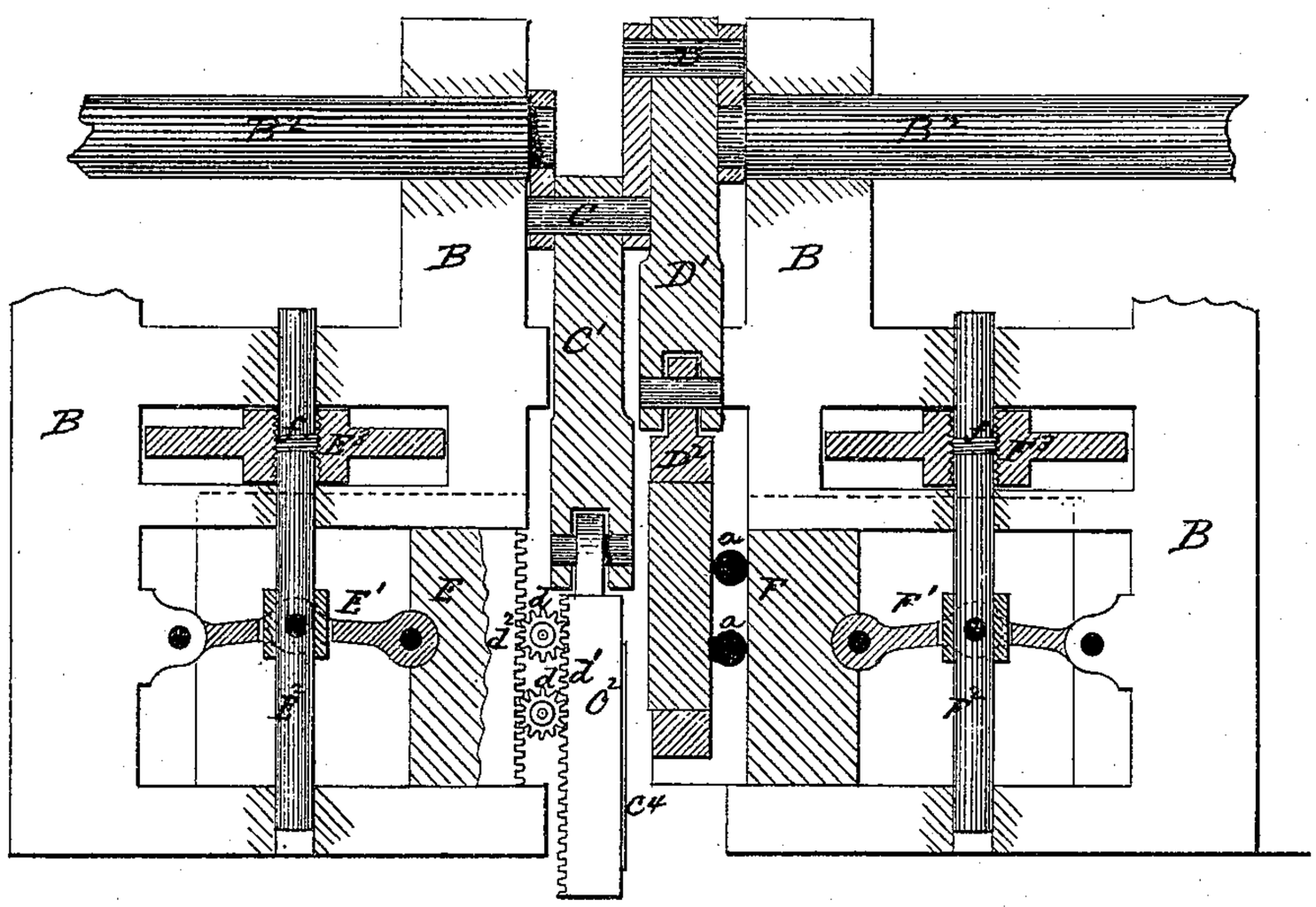
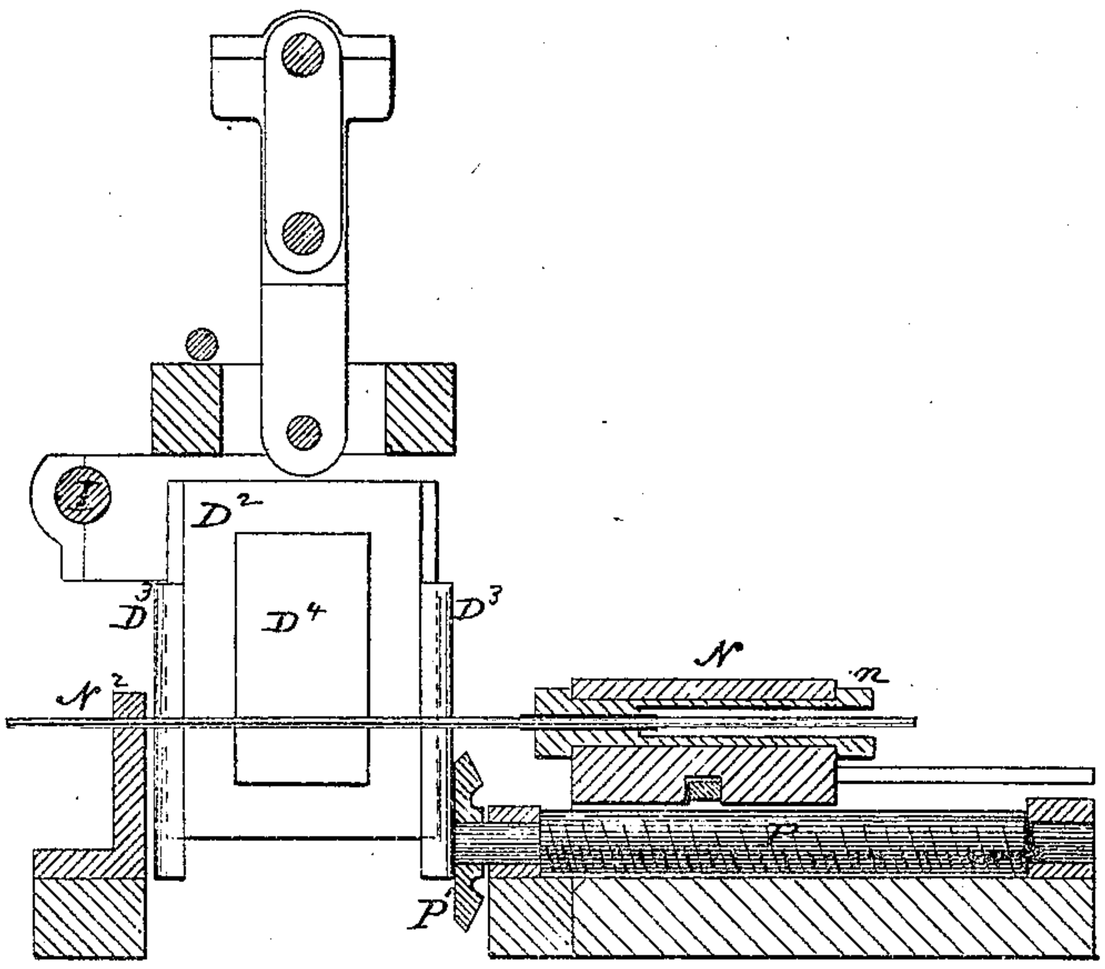


fig. 4



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UNITED STATES PATENT OFFICE.

HENRY KELLOGG, OF MILFORD, CONNECTICUT.

IMPROVEMENT IN METAL-ROLLING MACHINES.

Specification forming part of Letters Patent No. **133,452**, dated November 26, 1872.

To all whom it may concern:

Be it known that I, HENRY KELLOGG, of Milford, in the county of New Haven and State of Connecticut, have invented a new Improvement in Apparatus for Rolling Shafting; and I do hereby declare the following, when taken in connection with the accompanying drawing and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawing constitutes part of this specification, and represents, in—

Figure 1, a front view; Fig. 2, an end view; Fig. 3, a longitudinal central section; and in Fig. 4, a transverse central section.

This invention relates to a mechanism for rolling round rods, and is adjustable to various diameters; the object being to pass the rod to be rolled between two flat reciprocating surfaces, whereby rods of very small diameter may be rolled.

In the application which I have filed in even date herewith, and marked C, cylinders are employed for rolling the rods, but, as there mentioned, no less diameter can be wrought than the distance between the cylinders at their closest proximity to each other. This invention is therefore designed for a more extended use than such cylinders are capable of; and it consists in the arrangement of a pair of adjustable flat plates, whose surfaces are parallel, or nearly so, to each other, and to which a reciprocating movement is imparted, the plates moving always in opposite directions and at an equal velocity, whereby the rod to be rolled, placed between them, revolves, but maintains always the same axial position; and with these plates is combined a mechanism for adjusting the plates and for feeding the rods, as more fully hereinafter described.

A is the bed of the machine, upon which are placed uprights B to form bearings B^1 for the driving-shaft B^2, to which power is applied in the usual manner for similar machinery. At or near the center are two cranks or eccentrics, C D, from which connecting-rods C^1 D^1 extend down to and in connection with vertical carriages C^2 D^2. These carriages are supported in guides C^3 D^3 to retain them in their vertical position, so that, the shaft revolving, a corresponding reciprocating movement is imparted, but in exact opposite directions. Upon the face of these carriages are arranged plates or rolling-surfaces C^4 D^4, as denoted in Figs. 3 and 4. These plates are designed to operate upon the blank or rod to be placed between the said plates. To avoid friction upon the plates, which would necessarily be occasioned by their sliding in their guides, I arrange back of each carriage two or more rolls, *a a*, as seen in Fig. 3, the axes of which are at right angles to the line of movement of the said plates, which rolls roll upon solid bearings E F, respectively, in the rear of the said plates, as seen in Fig. 3, these rolls taking the bearing of the plates, the guides serving only to retain the plates in their proper relative position. To retain the said rolls in their proper relative position, I apply to each end of the rolls a pinion, *d*, and to the corresponding edges of the carriage a rack, d^1, and a corresponding rack, d^2, on the bearings E F, the "pitch-line" of the pinion and rack corresponding to the diameter of the rolls, so that, the carriages moving as before described, the rolls revolve and work up and down between the carriages and their bearings in consequence of the said pinion and racks, but always maintaining their proper position.

In order to adjust the plates to a greater or less distance from each other, the bearings E F, to which the guides C^3 D^3 are attached, as seen in Figs. 1 and 3, are also arranged to slide in a properly-guided path longitudinally, and to these, respectively, a toggle, E^1 F^1, is applied in the rear, through the knuckle of which a shaft, E^2 F^2, passes vertically and up through a toothed wheel, E^3 F^3, the shaft at that point being threaded, as at *f*, and the wheel correspondingly threaded, so that by the turning of these wheels the said shafts are drawn up or down, accordingly as the said wheels are turned, correspondingly contracting or extending the said toggle and opening or closing the plates.

To perform this operation gradually, so that the rolling operation will reduce the diameter of the rod being rolled, a shaft, I, is arranged longitudinally across the machine in a line with the said wheels, on which worms are arranged to work in the teeth of the said wheels. To this shaft motion is imparted by the driving-shaft, or otherwise, here represented as by belts I^1 I^2, the pulleys on the shaft I being

loose and one of the belts crossed, whereby one pulley will run in one direction and the other pulley in the other direction. Between these pulleys I arrange a clutch, L, splined to the shaft I, but to slide freely thereon into connection with either pulley, accordingly as the movement required is in one direction or the other, in the usual manner for reverse motions.

Thus constructed, and the plates opened to receive the rod to be rolled, and the working parts in operation, the rod is inserted between the plates, and the plates, coming in contact with the surface of the rod, roll the rod between them, and as the plates gradually approach each other, as before described, the diameter of the rod is correspondingly reduced, and so soon as the required diameter is attained the clutch is disconnected from the pulley to cease the further action of the toggles; then the rod is gradually drawn through between the plates, working it throughout its length to the diameter fixed by the position of the plates, and leaving the surface perfectly smooth and the rod perfectly round.

To automatically arrest the action of the toggles at the required time, I arrange a stop upon one of the wheels E^3 or F^3, which at the required time actuates the clutch to disengage it from the driving-pulley.

To open the plates it is only necessary to engage the clutch with the other pulley to reverse the action of the shaft which drives the wheels E^3 and F^3.

To automatically feed or draw the rod from between the plates, I arrange a carriage, N, upon a guide, N^1, at right angles to the plates, the said carriage carrying a mandrel, *n*, to receive the rod to be rolled, and in such relative position to the plates that the axial line of the said mandrel shall also be the axial line of the rod to be rolled when in position between the plates. The said mandrel is provided with any suitable device for securing the rod firmly therein.

A movement to or from the plates is given to the carriage by means of a leading-screw, P, supported in guides, and in connection with the said carriage, so that by the revolving of the screw the carriage is moved to or from the plates accordingly as the screw is turned to the right or left.

A movement is given to the screw corresponding to the movement of the plates by means of eccentrics T T^1 on the driving-shaft, the positions of the said eccentrics corresponding to the cranks which move the plates, so that the dead-centers occur at the same time. These eccentrics are connected by rods S and levers S′ to ratchets R on a shaft, T^2, which shaft has a bevel-gear in connection with a corresponding bevel-gear, P′, on the screw P, as seen in Figs. 1 and 4. The ratchets act alternately, the one on the descent of one plate and the other on the descent of the other plate, thus causing the screw to move simultaneously with the plate, so that, working from the plates, and with the rod fixed therein, the rod is gradually drawn from the plates.

To set in operation, the carriage is moved up to the plates, and there secured to the rods and put in connection with the screw so soon as the plates have attained the position to give the requisite diameter, as before described, gradually drawing the rod through between the plates.

To sustain the rod upon the back side a support, N^2, is arranged as in Fig. 4, corresponding in position to the mandrel upon the opposite side, and others may be applied, if necessary.

If desirable, a noduled or botryoidal surface, as described in my application B for a similar invention, filed in even date herewith, may be given to the rolling surfaces.

I claim as my invention—

1. A pair of reciprocating plates or surfaces, C^4 D^4, arranged upon carriages having a reciprocating movement, the said surfaces being parallel to each other, and the toggles E^1 and F^1 and their connections, to automatically cause the said rolling surfaces to gradually approach each other, to roll and revolve the blank placed between them, substantially as specified.

2. In combination with the subject-matter of the first clause of claim, I claim a mandrel, *n*, arranged relatively to the said plates, to hold and support the blank or rod being rolled, substantially as specified.

3. In combination with the subject-matter of the first clause of claim, I claim the carriage N carrying the mandrel *n*, and to which, through a leading-screw, P, or its equivalent, actuated automatically by the driving mechanism of the machine, a retreating movement is imparted, timed in its movement relatively to the movement of the plates, substantially as set forth.

HENRY KELLOGG.

Witnesses:
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