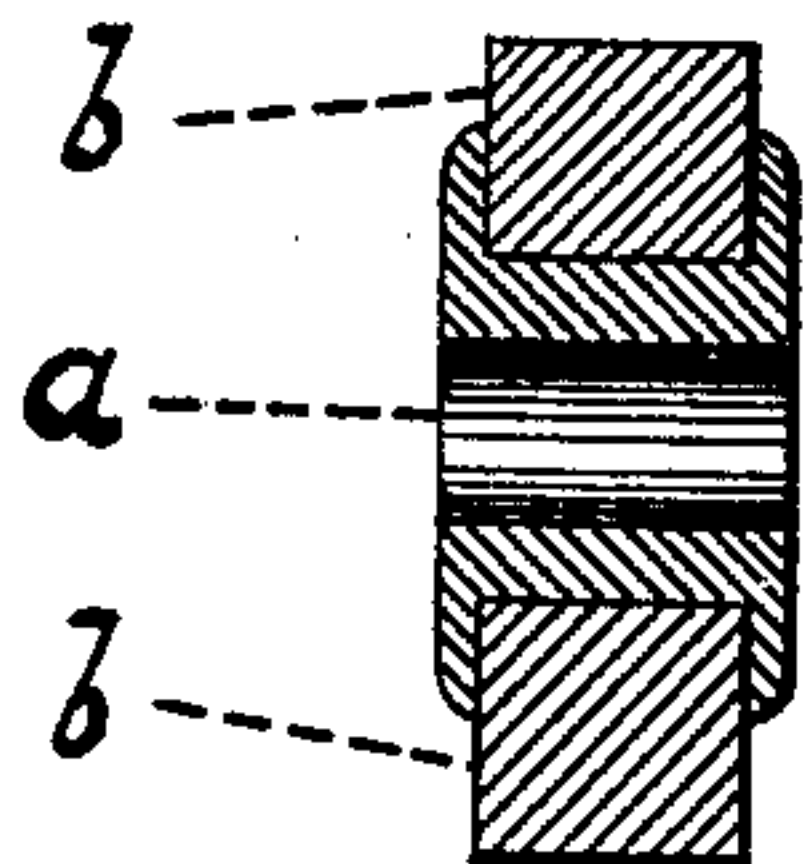
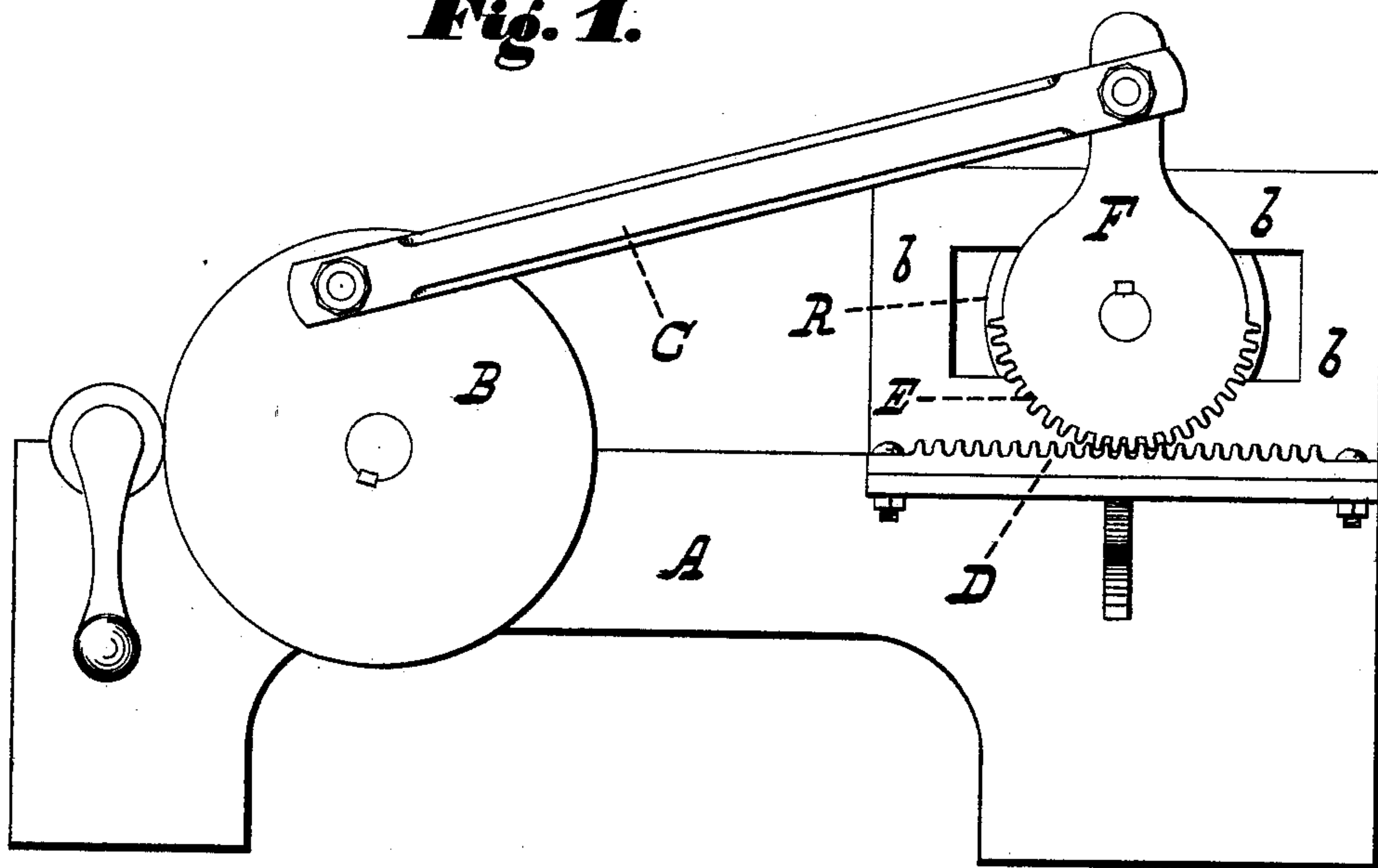


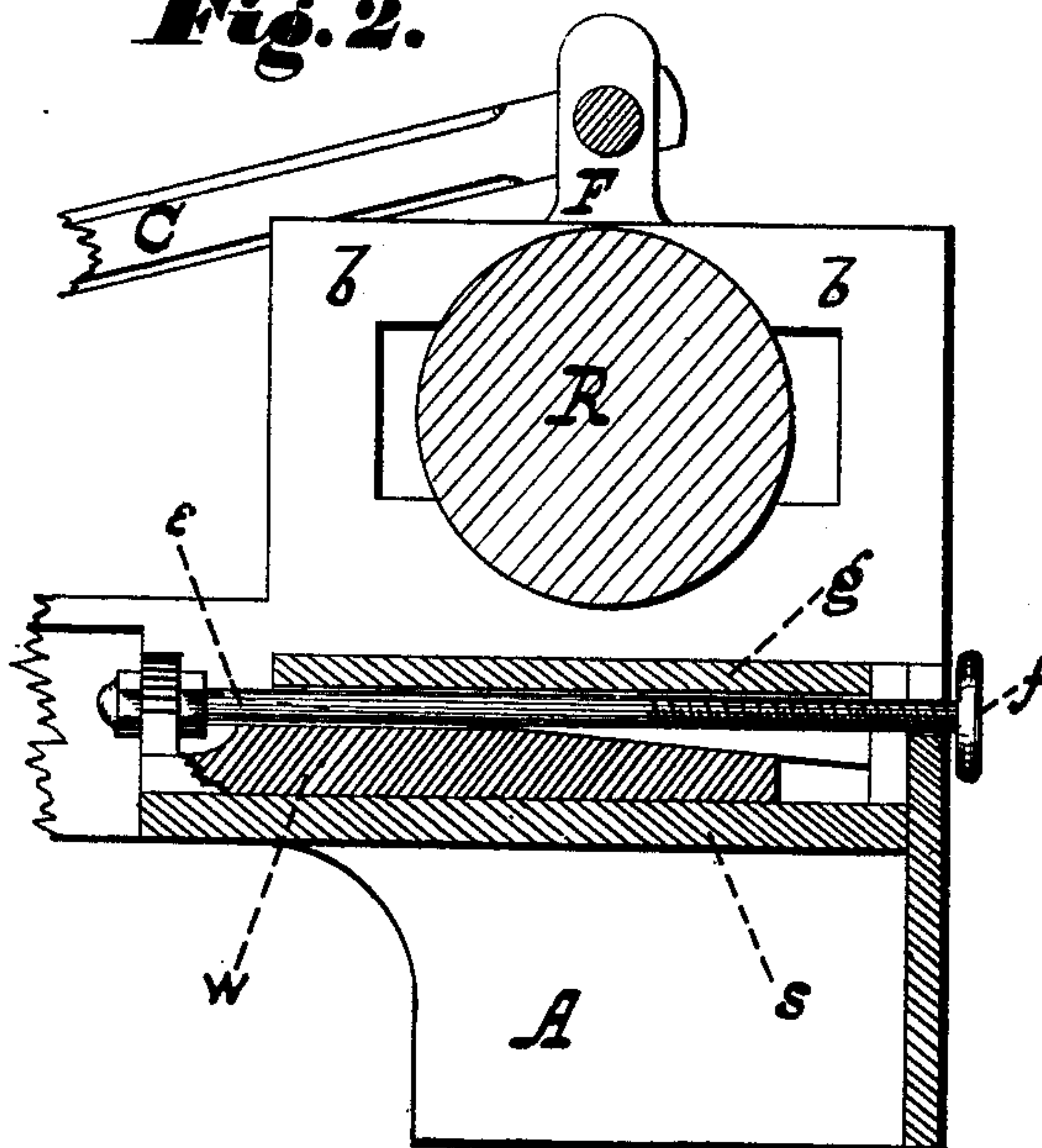
A. REESE.  
MACHINE FOR ROLLING ARTICLES OF METAL.  
No. 190,620. Patented May 8, 1877.

**Fig. 1.**

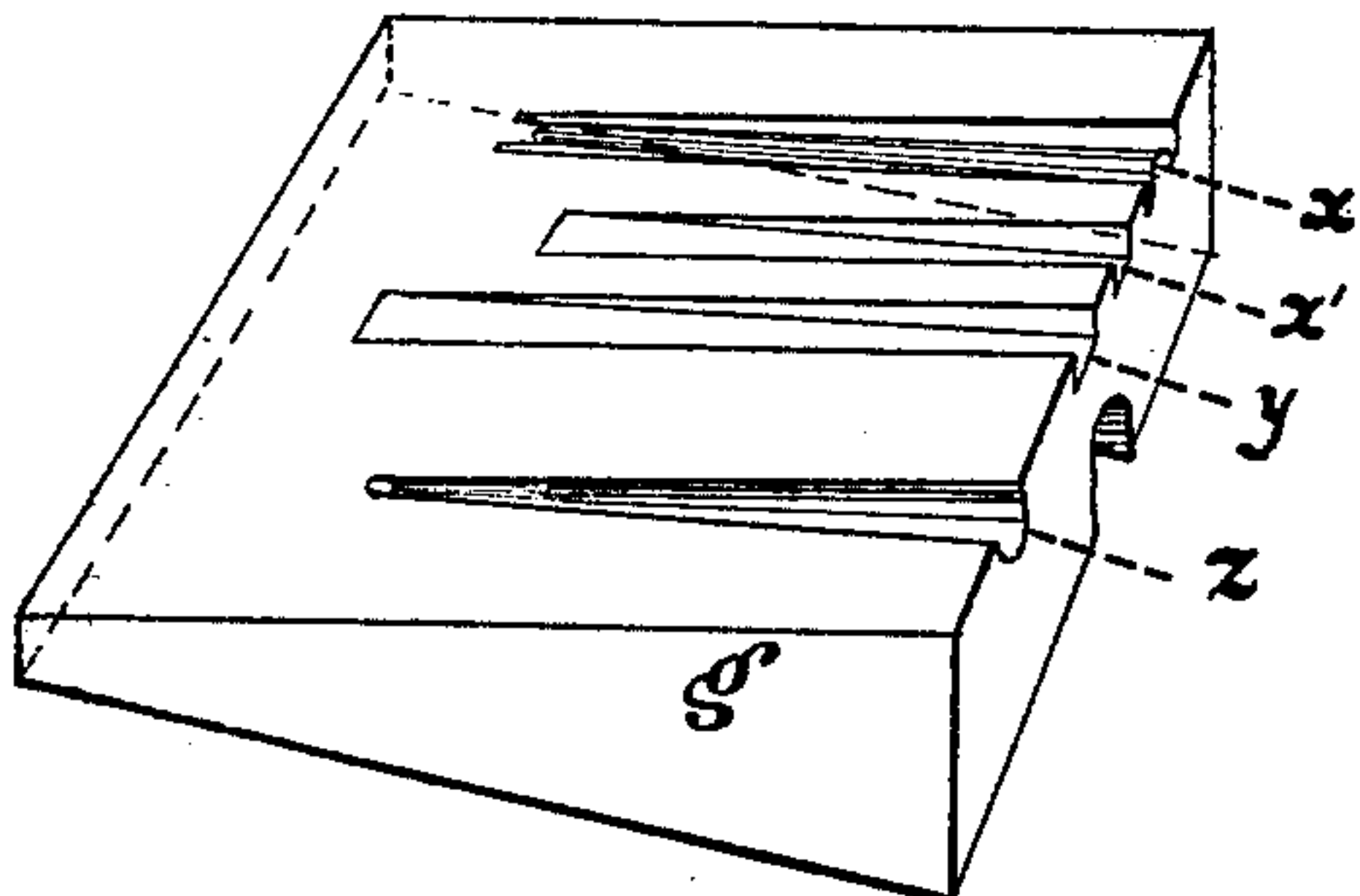


**Fig. 3.**

**Fig. 2.**



**Fig. 4.**



Witnesses

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# UNITED STATES PATENT OFFICE

ABRAM REESE, OF PITTSBURG, PENNSYLVANIA.

## IMPROVEMENT IN MACHINES FOR ROLLING ARTICLES OF METAL.

Specification forming part of Letters Patent No. 130,620, dated May 8, 1877; application filed August 4, 1876.

*To all whom it may concern:*

Be it known that I, ABRAM REESE, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Machines for Rolling Metal; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification, in which—

Figure 1 is a side elevation of the machine. Fig. 2 is a longitudinal section of roll and bed. Fig. 3 is a section showing roll journal-box and the sliding pillow-block in relation to housings. Fig. 4 is a view of a die, grooves  $x$   $x'$  being for the different sides of a plow-beam,  $y$  for a reaper-bar, and  $z$  being for a "tapered round."

This invention relates to machines for rolling metal into tapered or other irregular forms, such as plow-beams, reaper-bars, horseshoes, &c.; and consists in the combination of a vertically-adjustable die-bed, a longitudinally-adjustable supporting-wedge, a reciprocating roll, toothed segments attached to the ends of said roll, and provided with crank-arms for the application of power, a stationary rack for the engagement of said segments, and connections for communicating power to operate the roll; also in the novel construction, combination, and arrangement of elements in a machine for rolling irregular forms, having the peculiarities hereinafter more fully described, and as specified in the claims.

The primary object of this invention is to provide adequate resisting capacity to compensate for the great pressure necessarily required in the operations for which this machine is intended, and to provide suitable means for the application of power, and for the adjustment of a bed subject to such pressure, such means of adjustment being specially adapted to a bed which must not be allowed to yield or spring at any point under superincumbent strain.

Referring to the drawings herewith, my invention is as follows: Seated in bearings on a frame or foundation, A, is a shaft carrying at each end a wheel, B. Power may be com-

municated to these wheels in any way desired, whether by gearing, friction, or crank. Attached to wrist-pins similarly situated on each wheel are the pitmen C, so that wheels and pitmen all move exactly together. On each side of frame A is a permanent fixed rack, D, situated as shown. Gearing with this rack, on each side, is a toothed segment, E, on a rocking frame, F, into which the ends of roll R are fitted concentrically with the segment E. The journals of the roll R pass through the sliding pillow-blocks  $a$ , which reciprocate in the massive housings  $b$ . The rocking frame F is prolonged on the side opposite the segment, and is there coupled by a wrist-pin to the pitman C. Thus arranged great mechanical advantage is obtained through the rocking frame for the movement of the roll, for the interlocking teeth form a variable fulcrum, the center of the segment-arc is the point of resistance, and the wrist-pin the point of application of the power. Hence, according to the illustrations, the mechanical advantage is in the ratio of about three to one.

Thus far we have only a regularly reciprocating and rocking motion of the roll. The remainder of my invention lies in the bed and its adjustability, as I will now describe.

That part of frame A under the track of the roll is constructed with a strong web forming a shelf,  $s$ . Resting on top of this shelf is a wedge-block,  $w$ , to which is attached an adjusting-screw,  $e$ , projecting laterally through the end of the frame, and adapted, by means of a hand-wheel or crank,  $f$ , to move the wedge in and out under the bed  $g$ . This is also wedge-shaped, having its upper surface horizontal or parallel to the plane of motion of the roll R. It is raised and lowered by operating the hand-wheel, which works the wedge  $w$  in and out, so that, though the wedge  $w$  has longitudinal movement, the bed  $g$  has only vertical.

The purpose of this will be shown in the operation, which is as follows: To illustrate, we will take the example of a reaper-bar. The bed  $g$  is recessed to the form shown at  $y$ , Fig. 4. It is adjusted, by means of wheel  $f$ , to form a space between it and the roll slightly smaller than the section of the bar to be tapered. Then the bar is laid in groove  $y$ , and one or more passes of roll R permitted to take



place. Then the bed is screwed up a little, and a further reduction takes place; and so on, the bar being gradually reduced until the required size is obtained. Should the metal at any time exhibit a tendency to "fin," it is only necessary to turn it flatwise and allow a pass or two between the plain surfaces of the bed and roll, which may be instantly adjusted to suit. Every motion of the hand-wheel effects a proportionate longitudinal movement of the wedge *w*, and vertical movement of the bed *g*. Hence, the operator can keep a constant hold on the bar, since it does not pass, and change or modify the area between each pass of the roll when the pressure is off the bar.

Many advantages follow from such construction, chief among which are the roll works both ways over the bar and effects a perfect and thorough distribution of the particles, and does not disarrange the fibrous structure of the bar—an immense advantage, and of vast importance in its bearing upon the strength of the article. The machine may be in constant operation, and as no pressure comes upon the bed *g* until the bar is laid in place, its adjustment is at all times easy, and no stoppage is required. In rolling iron, and still more in rolling steel, it is very important to be able to reduce the area between passes, which is here easily effected. This advantage is clearly exhibited in the fact that iron and steel both can be equally well worked in my machine. Iron does not require so many passes as steel, and, consequently, the number of passes or repetitions of passes being entirely under the operator's control, he can, with equal facility work both steel and iron. The rolls having a fixed determined motion, soon wear the slides smooth, and run freely, notwithstanding the great pressure, whereas rolls that follow a pattern necessarily come in contact with ever-changing bearings—a great disadvantage, very apparent to practical rollers.

If desired for some special forms the roll may be grooved or collared to suit. In this way the machine may be made to roll many of the forms that are now reached only by forging or casting, one process expensive and the other not reliable.

Several modifications of the wedge principle might be introduced, if so desired. For instance, the bed might have its two faces parallel, and the adjusting or lower wedge operate on a fixed inclined plane.

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

1. In a machine for rolling irregular forms in metal, the combination of the adjustable die-bed *g*, wedge *w*, reciprocating roll *R*, toothed segments *F* provided with crank-arms for the application of power, stationary racks *D*, and pitman or link connections *C* for communicating power to operate the roll, substantially as described.

2. A machine for rolling irregular forms in metal, embracing the following instrumentalities, to wit: the main frame *A*, adjustable bed *g*, wedge *w*, duplicate housings *b b*, reciprocating roll *R* supported in said housings at both ends of its shaft, toothed segments *F*, provided with crank-arms for the application of power, and means, substantially as described, for communicating power on both sides of the machine to the roll, as and for the purpose set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 27th day of July, 1876.

ABRAM REESE.

Witnesses:

SAMUEL ANDERSON,  
THOS. J. MCTIGHE.