

(No Model.)

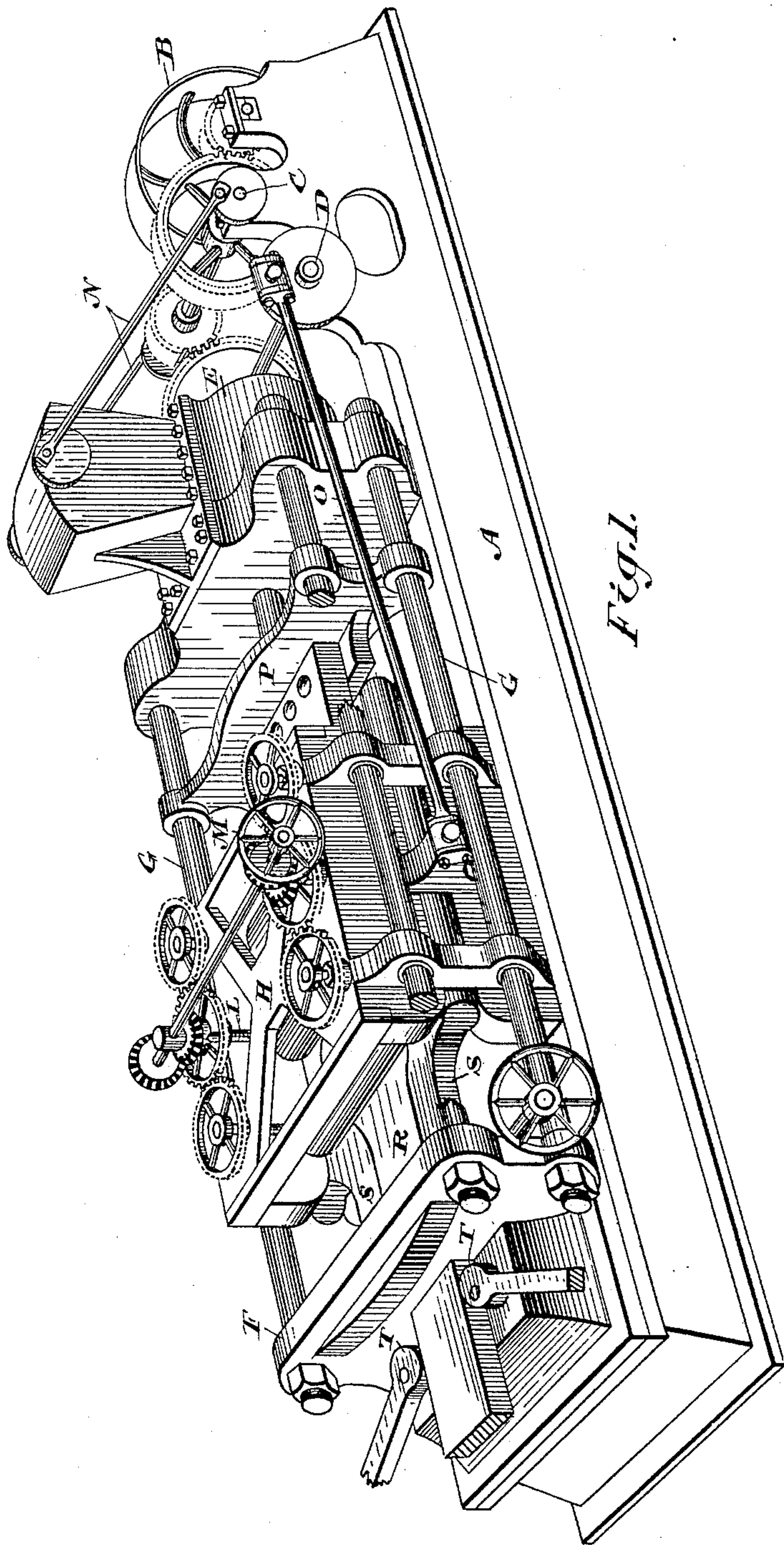
2 Sheets—Sheet 1.

W. ROSS.

MACHINE FOR UPSETTING METAL BARS.

No. 394,011.

Patented Dec. 4, 1888.



Witnesses.
F. B. Fethurstonsburgh,
J. M. Jackson.

Inventor:
William Ross.
By Small G. Ridout & Co
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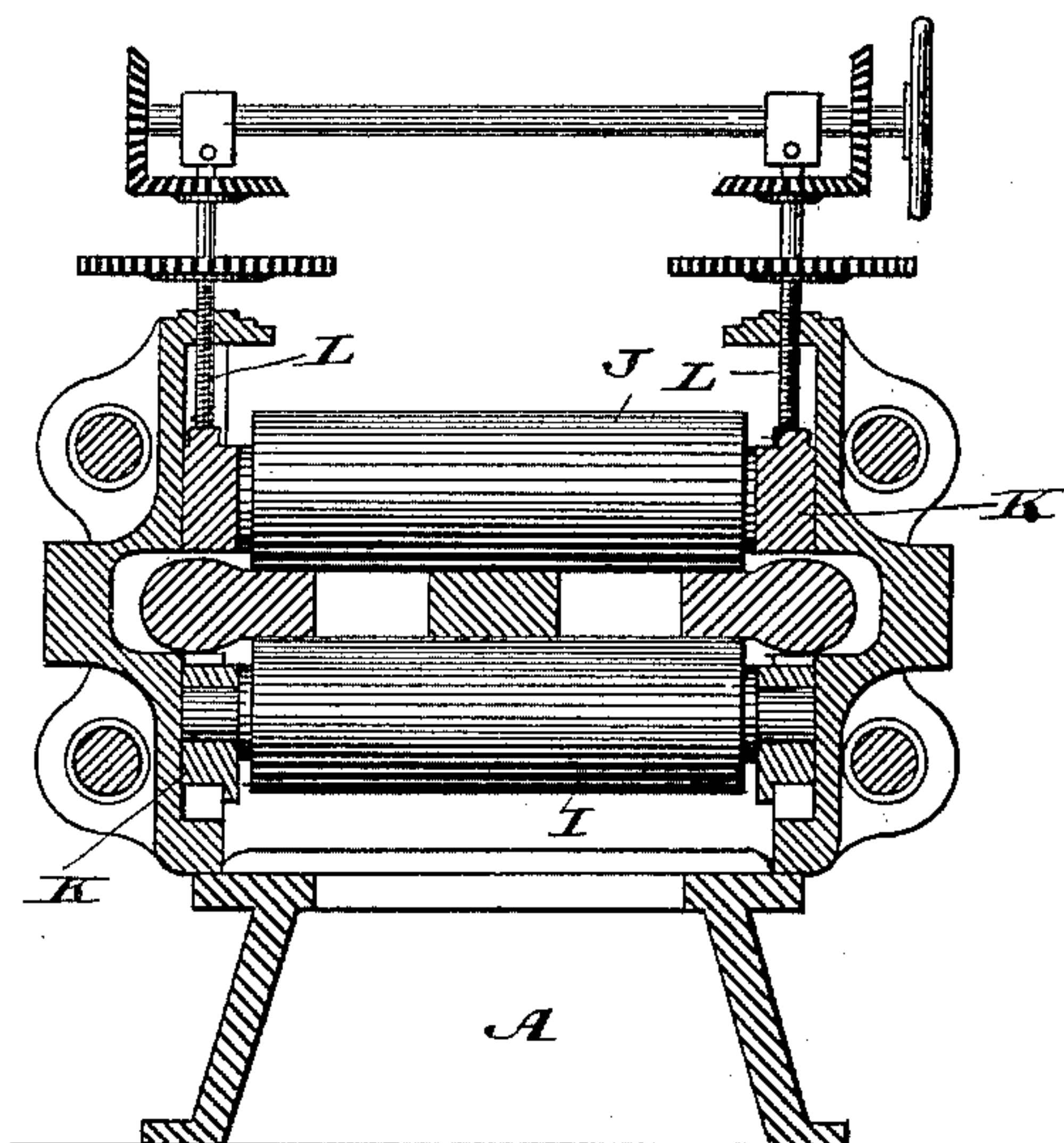


Fig. 2.

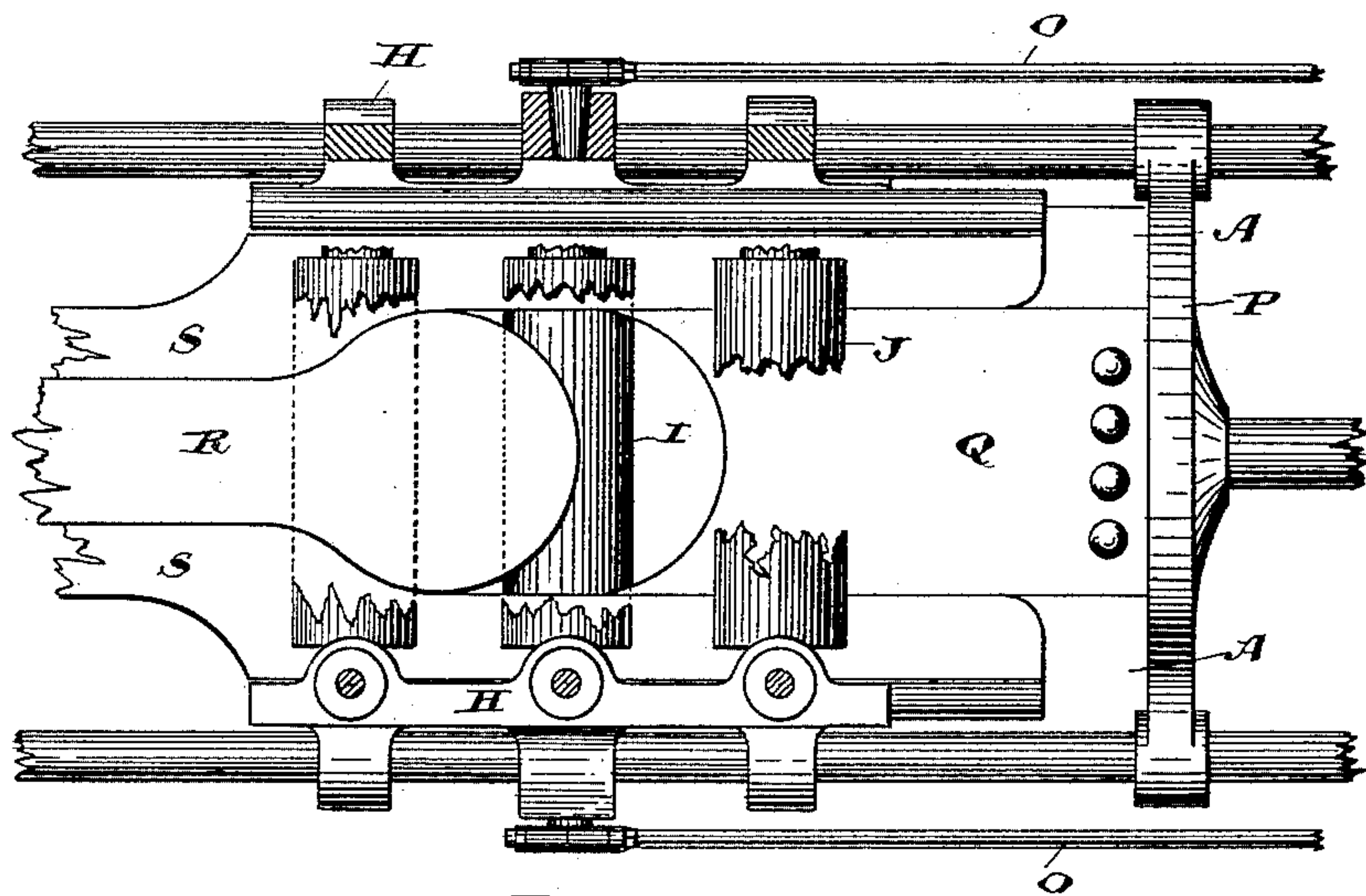


Fig. 3.

Witnesses.

F. B. Fethertonhaugh.
J. M. Jackson

Inventor:

William Ross.
by Donald C. Ridout & Co
Attys

UNITED STATES PATENT OFFICE.

WILLIAM ROSS, OF LACHINE, QUEBEC, CANADA.

MACHINE FOR UPSETTING METAL BARS.

SPECIFICATION forming part of Letters Patent No. 394,011, dated December 4, 1888.

Application filed April 16, 1888. Serial No. 270,725. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM ROSS, machinist, of the village of Lachine, in the county of Hochelaga, in the Province of Quebec, Canada, have invented a certain new and useful Machine for Upsetting Iron, Steel, or other Metals, of which the following is a specification.

The object of the invention is to design a machine in which iron, steel, or other metal may be upset and simultaneously formed into any desired shape without in any way injuring the metal; and it consists, essentially, of a machine having a slowly-moving ram arranged to upset metal by direct and steady pressure, reciprocating rollers acting on the metal and driven at a high rate of speed, being operated in connection with the slowly-moving ram for the purpose of keeping the metal straight during the operation of upsetting, and at the same time form the said metal into any desired shape, the whole being constructed and operated substantially as hereinafter more particularly explained.

Figure 1 is a perspective view of my improved upsetting-machine, with a portion of one of the guide-bars broken away. Fig. 2 is a cross-section of the special center rollers and side dies used in upsetting and rolling eye-bar heads. Fig. 3 is a plan of the same rollers.

Before referring to the specific parts of my machine I may say that I do not claim anything new in an upsetting-machine having a slowly-moving ram for the purpose of upsetting the metal, as I am aware that such machines are now made; but in all machines of this kind with which I am familiar the bar of metal being upset is distorted, and if of iron the fibers are bent and separated by the spreading force caused by the compressing force of the ram.

In the adoption of quickly-moving rollers arranged to operate over the portion of the metal being upset I am enabled to keep the fibers of an iron bar straight, to keep a steel bar from folding back on itself, and to increase the strength of either metal by additional "working," which this rolling gives it.

In the drawings, A is a heavy bed-plate, on which all the parts of my machine are carried.

B is a driving-pulley carried on a shaft suitably journaled in boxes carried in the bed-plate A. This driving-pulley is connected to any suitable motor, and is geared, as indicated, or in any other suitable manner, to the shafts C and D, so that the said shafts shall revolve with the driving-pulley B.

A hydraulic cylinder, E, is securely bolted to the bed-plate A, and is preferably connected to the head-block F by the rods G, which act as guide-rods for the truck H. The lower rollers, I, are suitably journaled in the lower portion of the truck H, and the upper rollers, J, are journaled in suitable boxes, K, held in guides formed on the upper portion of the truck H. Each of the boxes K is suitably connected to a spindle, L, which spindles are all connected together, as indicated in Fig. 1, by gearing operated by a hand-wheel, M, so that the rollers J may be readily adjusted vertically nearer to or farther from the rollers I to suit the thickness of the metal being acted upon.

The hydraulic cylinder E is connected to any suitable hydraulic pump, the construction of which is not necessary to be described in this specification; but I prefer one which I have specially-designed for the purpose, and intend describing it in a separate application for a patent. This pump is operated by the shaft C, which is connected to the crank-shaft of the pump by the pitman N, as shown.

The truck H derives a reciprocating motion from the shaft D, to which it is connected, as indicated, by the connecting-rods O.

The cross-head P, connected to the plunger of the hydraulic cylinder E, is connected to the end die, Q. It follows, therefore, that when the machine is in operation the truck H has a quick reciprocating motion, while simultaneously the cross-head P with its end die, Q, is slowly moved longitudinally toward the head-block F. The rollers I and J will of course be made any shape which it is desired and intended to form the metal to be upset, and are located at such a point that they will travel backward and forward over the surface of the metal where it is being upset.

In operation my machine acts as follows: The bar R, which in the drawings represents the piece of metal to be upset, is first heated

at the point to be acted upon, and is then inserted between the side dies, S, and is locked in position by the cams T. The machine is put into operation and the end die, Q, is brought
 5 slowly against the end of the bar R, and is pressed against it with a steady powerful force sufficient to upset or enlarge the cross-section of the bar, which naturally has a tendency to increase in thickness, but which is kept to a
 10 uniform thickness by the rapid reciprocating motion of the rollers I J; or, if the metal is to be formed into any other desired shape than that shown, the forms of the rollers and dies are changed, and by their action will shape
 15 the end of the bar R into the desired form. The reciprocating action of the rollers on the bar R is very beneficial in working the metal while it is being upset, as it retains the fibrous character of the metal, if of iron, and works
 20 out all blow-holes, small cracks, &c., in steel, due to imperfect rolling in the process of its original manufacture.

I have shown my combined upsetting and rolling machine, with the upsetting-plunger
 25 driven by hydraulic power and the roller-truck driven, as described, from the driving-pulley B. The upsetting-plunger might also be driven by steam or other power, and the truck by steam or other power direct. I therefore
 30 do not confine myself to any particular motor power.

What I claim as my invention is—

1. In an upsetting-machine, a slowly-moving die for longitudinally compressing the bar
 35 being upset, combined with quickly-moving rollers for vertically compressing said bar, and suitable side dies by which said bar is laterally formed or shaped, substantially as described.

40 2. An end die arranged to act against the end of the bar being upset, and means for giving said die a slow but powerful longitudinal movement, combined with rollers arranged

to act on the portion of the bar being upset, means for giving said rollers a quick reciprocating movement, suitable side dies for forming or shaping the metal forced into them by the end die and rollers, and clamping devices constructed to grip the bar being acted on and sustain the quick reciprocating motion of the
 50 rollers, substantially as and for the purpose specified.

3. In an upsetting-machine, a slowly-moving die constructed to longitudinally compress the bar being acted upon, combined
 55 with quickly-moving rollers arranged to simultaneously laterally compress the bar and to pass over the surface of that portion of the bar being upset, substantially as and for the purpose specified.

4. An end die arranged to act against the end of the bar being upset, and means for giving said die a slow but powerful longitudinal movement, combined with rollers arranged to act on the portion of the bar being upset,
 65 means for giving said rollers a quick reciprocating movement, and clamping devices constructed to grip the bar being acted upon and to resist the longitudinal movement of the end die and sustain the quick reciprocating motion of the rollers, substantially as and for the purpose specified.

5. The guide-rods G, the cross-head P, supported on said guide-rods, and the end die, Q, actuated by said cross-head, combined with
 75 the truck H, supported on said guide-rods, the rollers I J, and means for giving said truck a reciprocating movement to cause the said rollers to act on a portion of the bar being upset, substantially as and for the purpose specified.
 80

Montreal, March 15, 1888.

WILLIAM ROSS.

In presence of—

WILLIS WHITED,
 H. D. BUSH.