2 Sheets—Sheet 1.

# G. J. CAPEWELL.

## Machines for Reducing Metal.

**No. 196,334.** **Patented Oct. 23, 1877.**

*Fig. 1*

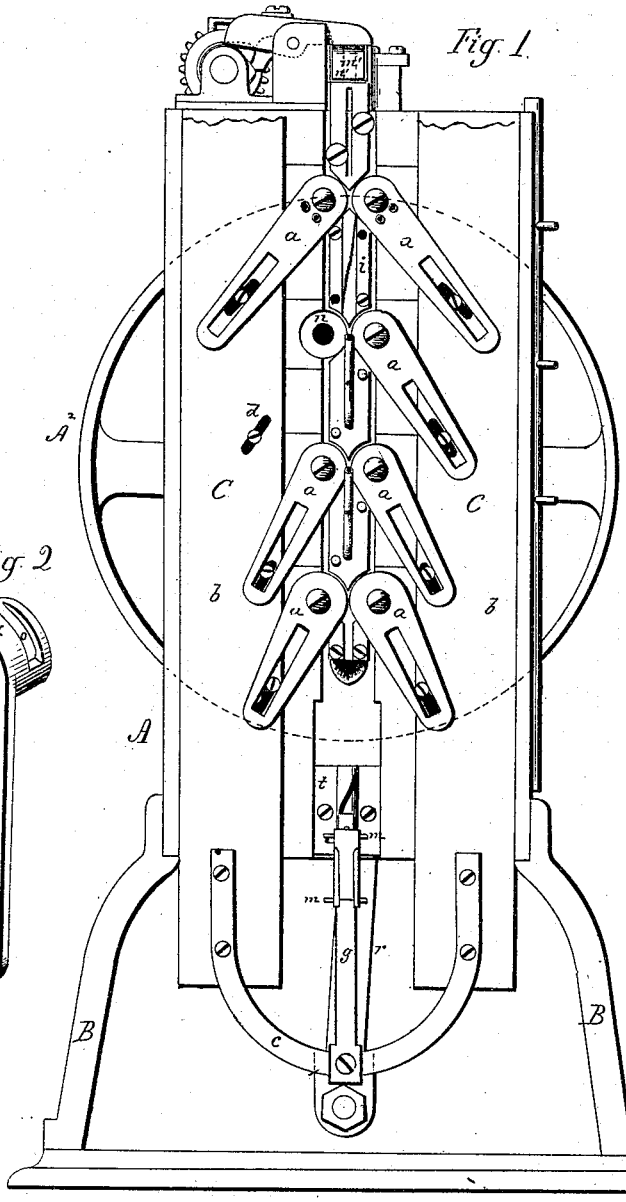


*Fig. 2*

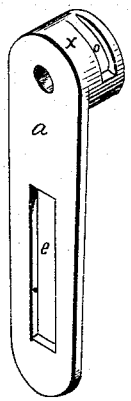


*Fig. 3.*

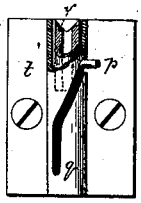


*Fig. 4.*


Witnesses.
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2 Sheets—Sheet 2.

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## Machines for Reducing Metal.

**No. 196,334. Patented Oct. 23, 1877.**

*Fig. 5*

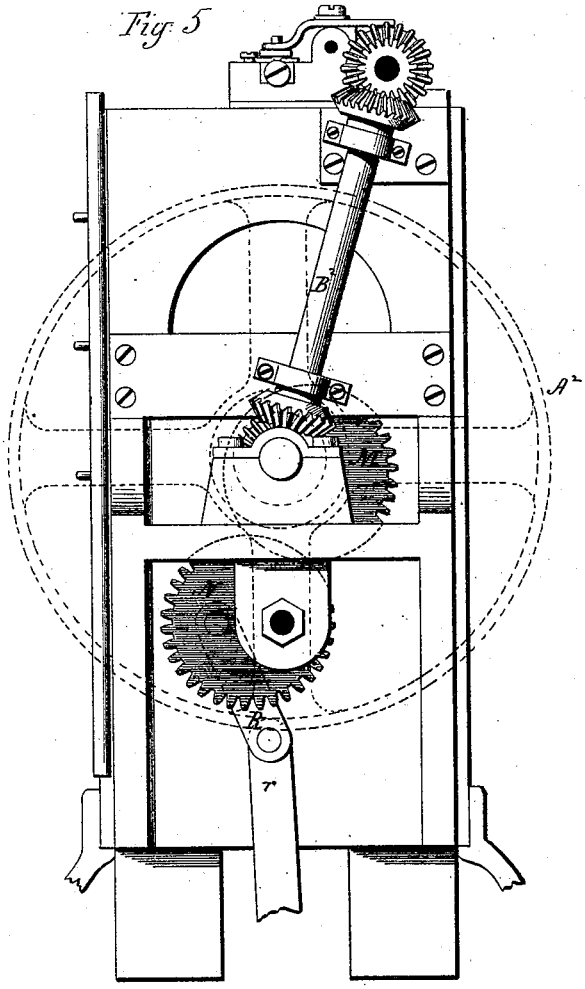
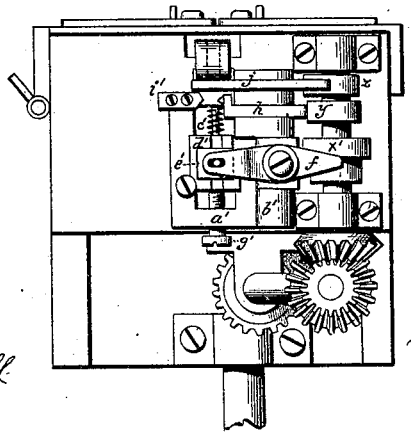



*Fig. 6.*




*Witnesses.*
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# UNITED STATES PATENT OFFICE.

GEORGE J. CAPEWELL, OF CHESHIRE, CONNECTICUT.

## IMPROVEMENT IN MACHINES FOR REDUCING METAL.

Specification forming part of Letters Patent No. **196,334**, dated October 23, 1877; application filed April 11, 1877.

*To all whom it may concern:*

Be it known that I, GEORGE J. CAPEWELL, of Cheshire, in the county of New Haven and State of Connecticut, have invented a new and Improved Machine for Reducing Metal Bars, which improved machine is fully set forth in the following specification, reference being had to the accompanying drawings, which form a part of the same.

This invention relates to that class of machines for reducing metallic bars in which guides are employed to turn said bars during their passage through the machine.

The nature of said invention consists in the construction of the pressure-rolls and other devices in combination therewith; also, in the peculiar arrangement and combination of the feeding devices; also, in the peculiar construction of the guides used, whereby the machine is adapted to cylindrical bars, all as hereinafter fully set forth and claimed.

In the accompanying drawings, Figure 1 is a front view of my improved machine, the lower part showing the application of my new guide for cylindrical bars. Fig. 2 is a detail view of a roll enlarged from the scale of Fig. 1. Fig. 3 is a detail view of one of the guides for cylindrical bars, and Fig. 4 is a detail view of the inner tube of the same. Fig. 5 is an elevation of the driving mechanism, and Fig. 6 is a top view of the feeding mechanism.

A, Fig. 1, is the metal frame to which the different parts of the machine are attached. It stands on four legs, (indicated by B,) two only of which are shown. C is a carriage, which, as it moves up and down, carries up and down the outer ends of the arms *a*, attached to the rolls. It consists of two side pieces, *b b*, connected together at the bottom by the curved piece *c*, and by a piece across the top similar to the side pieces. The side pieces are shown as broken off at top, and the top piece is omitted, in order to bring other parts into view. Both side pieces have the like slots *d*. A screw with an elongated straight head, passing through each of the slots, screws into a piece of metal, holding the screw in its place. This elongated head moves in the slots *e* in the arms *a*, and as the screw is moved up or down in the slot it gives more or less motion to the arms.

In Fig. 2, *x* is an enlarged view of one of the rolls. It is made with the groove *o*, and also with the slotted arm *a*. A hole is made through its center, through which a screw passes and holds it in the circular recess *n*, which serves as a bearing for the roll, and prevents strain on the screw that passes through its center. The grooves *o* diminish in size in the several pairs from the top pair of rolls, and vary in shape with the work to be done, and in each pair register one with the other.

The rolls are arranged in pairs. The pipes shown in the upper pair of rolls are connected by a channel in the rolls, and are for the purpose of allowing a current of water through the rolls, the pipes connecting with flexible pipes.

The device for turning round metal is shown in Figs. 3 and 4, and consists of a flat piece of metal, *t*, having a metal tube soldered to it. A spiral slot is made in this tube *q*, extending one-fourth the way around it, and terminating at its lower end in a straight slot parallel with the tube. Inside this tube another tube, *v*, is fitted, into which a pin, *p*, is inserted, running in the slot in the outer tube, and causing the inner tube to make a quarter-revolution as it is moved up and down by the pieces *m m*, attached to the rod *g*. This inside tube is shown in Fig. 4, and has a slot, *u*, and is provided with a spring, *s*, which clamps the round rod, causing it to turn with the tube. This device is also shown in Fig. 1, and, when used, the piece *g* extends to the top pair of rolls, and is provided with the pieces *m m* between each pair of rolls, operating on pins *p*.

In Fig. 6 are shown the devices on the top of the machine for feeding into the machine the bars of metal, and for cutting them into pieces of the requisite length. The piece *a'*, having the upright part *b'*, is screwed to the frame, and has the slot *c'*. The piece *d'* moves back and forth in the slot *c'*, and has a groove on its upper side, in which the bars of metal are placed. Over this groove the piece *e'* is placed, and pins pass through it into the piece *d'* to move the same. Over a pin in the piece *e'* the slotted lever *f* is placed, and pivoted to the part *b'* of the piece *a'*.

The lever *f* is operated by the cam *x'*, which

raises the end with which it is in contact, and presses the other end on the piece $e'$, clamping the bar, and which cam also moves the lever sidewise, and feeds the bar into the machine. A spiral spring forces back the piece $d'$, and holds the end of the lever against the cam $x'$. A set-screw, $g'$, regulates the extent of backward motion of the piece $d'$. The piece $h$ is fitted in the upright part $b'$ of the piece $a'$, and is moved by the cam $y$. It is provided with a cutting-edge, and is held against the cam by a spiral spring on its under side. The piece $i'$ is screwed to the piece $a'$, and has a cutting-edge opposite the edge on the piece $h$. These edges are not intended to meet, but to cut the bars partially off. The lever $j$ is also fitted in the upright part $b'$ of the piece $a'$, and is pivoted to it near its middle. Its ends are moved up and down by the cam $z$, and its inner end, in connection with a piece attached to the piece $a'$, forms shears for cutting off the bars in a line with the cuts made by the piece $h$ and $i'$. The part of the bar cut off is forced into the channel $m'$ under the hinged piece $n'$, and passes to the upper pair of rolls. A spring is placed in the upper end of the channel $m'$, which raises the pieces as they are cut off in line with the bars which force the pieces forward. The cams $x'$, $y$, and $z$ are arranged on a spindle turning in journal-boxes in the frame, one end of the spindle being provided with a bevel-gear wheel.

The parts shown in Fig. 5 are the means for imparting motion to the machine, and consist of the pulley $A^2$, which is attached to a spindle turning in the frame. On this spindle is placed a bevel-gear wheel, which meshes in a bevel-gear wheel on the spindle $B^2$. On the upper end of this spindle is another bevel-gear wheel, meshing in the gear-wheel on the spindle having the cams $x'$, $y$, and $z$. On the inner end of the spindle to which the pulley $A^2$ is attached is fastened the eccentric spur-gear wheel M, meshing in the eccentric-wheel N, turning on a stud in the frame. To this wheel N the arm R is attached, to which one end of the connecting-rod $r$ is pivoted, its other end being pivoted to the curved piece $c$ of the carriage C.

The operation of some of the parts of the machine has been described in describing the parts. The general operation is as follows: The bars of metal are fed into the machine, cut into pieces of the requisite length, and forced into the channel leading to the rolls by the mechanism on the top of the machine. The pieces will then stand in a vertical position, with their lower end against the largest part of the grooves $o$ in the rolls $x$. As the rolls are turned the pieces are subjected to their action, and as the pieces make a quarter-turn between the pairs of rolls, they are continually compressed toward their centers, and leave the machine in a shape determined by the form of the grooves in the rolls.

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

1. The combination of pressure-rolls $x$, having grooves $o$ and slotted arms $a$, with vertically-reciprocating carriage C, provided with studs for engaging said slotted arms, substantially as set forth.

2. Feed-carriage or slide $d'$, plate $e'$, slotted lever $f$, and cutters $h$, $j$, and $i'$, in combination with cams $x$, $y$, and $z$, and a rotating shaft carrying said cams, substantially as and for the purpose set forth.

3. In a machine for reducing bars of metal, a guide for cylindrical bars, consisting of an exterior tube, in combination with an inner tube having a slot, spring, and pin, and means for operating said inner tube, substantially as set forth.

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Witnesses:
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EDWIN MUNSON.