

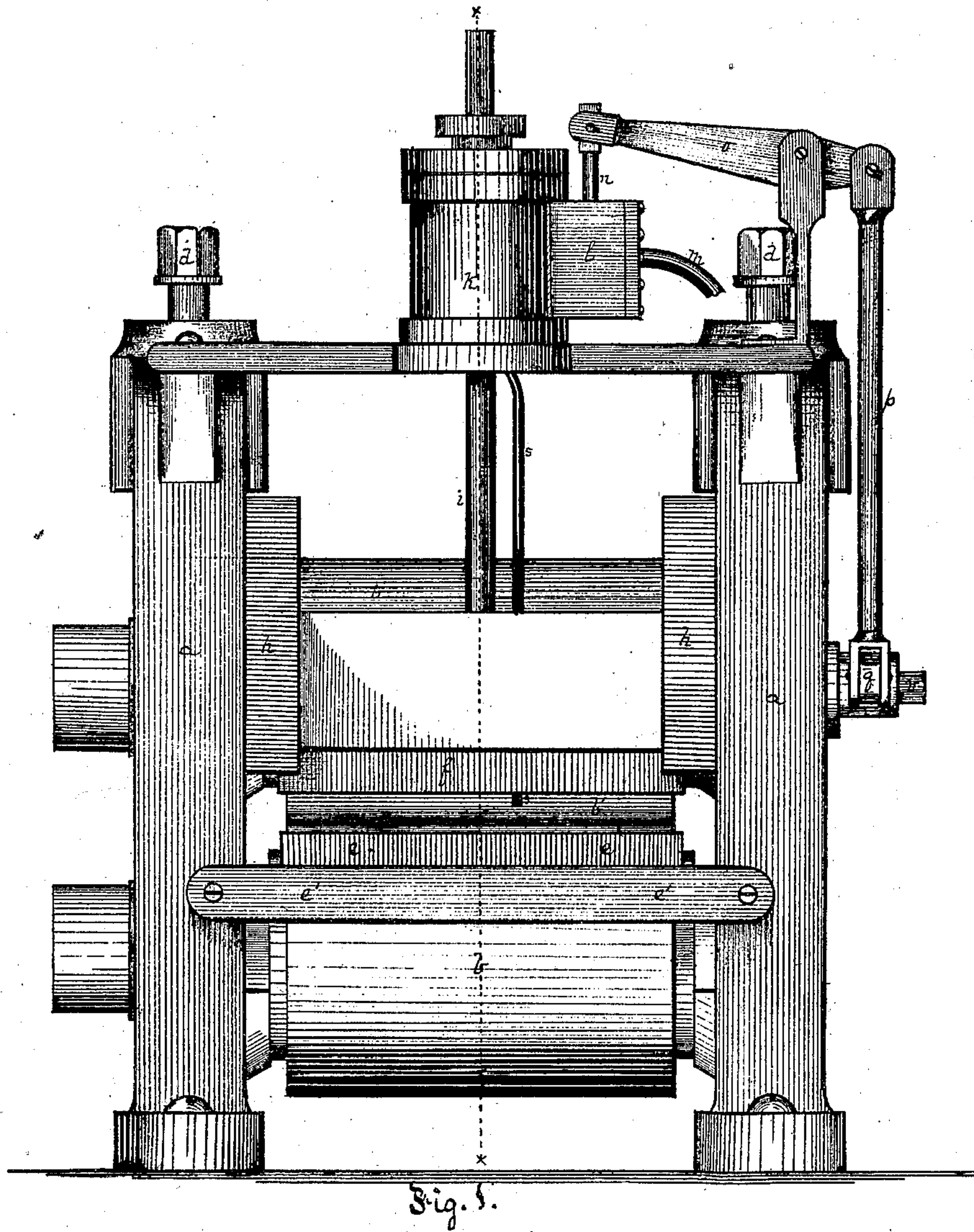
C. Zug,

3. Sheets. Sheet 1.

*Scrapping Iron.*

No. 113611.

*Patented Apr. 11. 1871.*



Witnesses:  
R. L. Renshaw  
Thos. B. Kerr

Inventor:  
Christopher Zug,  
by Bakewell Knolly,  
his Attys.

C. Zug,

Strapping Iron.

No. 113611.

Patented Apr. 11. 1871.

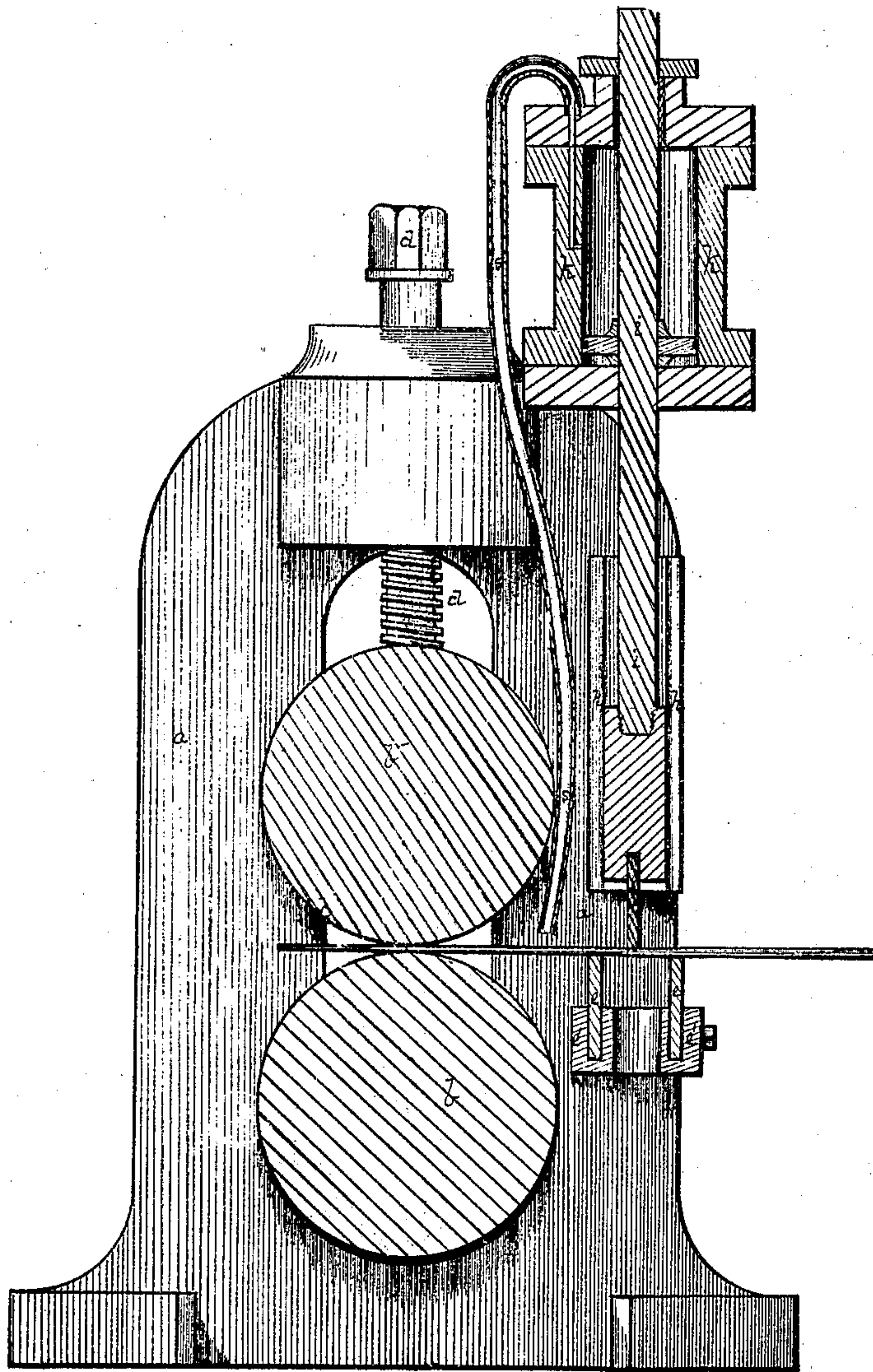


Fig. 2.

Witnesses:

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Inventor:

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# United States Patent Office.

CHRISTOPHER ZUG, OF PITTSBURG, PENNSYLVANIA.

Letters Patent No. 113,611, dated April 11, 1871.

## IMPROVEMENT IN MACHINES FOR SCRAPING IRON.

The Schedule referred to in these Letters Patent and making part of the same.

*To all whom it may concern:*

Be it known that I, CHRISTOPHER ZUG, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Machine for Scaling Rolled Metals; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawing making a part of this specification, in which—

Figure 1 is a front elevation of my improved machine for scaling plate or bar-iron;

Figure 2 is a sectional view of the same through  $x$ , fig. 1; and

Figure 3 is an end view of the same showing a tripping device.

Like letters of reference indicate like parts in each.

In the process of scraping the scale from plates, sheets, slabs, or bars of rolled metal, heretofore in use, the scrapers are operated by hand.

My invention, being an automatic device for operating the scraper, allows me to dispense with the manual labor, thus cheapens the manufacture of such forms of metal, and produces a better surface in the article manufactured.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and mode of operation.

In a housing,  $a$ , I arrange, in the usual way, the plain-faced sheet or plate-rolls  $b$   $b'$ , the upper one,  $b'$ , resting upon the lower roll  $b$ , and steadied in the housing  $a$  by suitably-shaped blocks or bearings,  $c$   $c$ , which keep it in the proper position directly over the lower roll  $b$ , but allow it to move up and down in the housing  $a$ , as may be necessary.

The lower roll  $b$  is mounted in the usual way.

The limit of upward movement of the roll  $b'$  is regulated at pleasure by means of the pressure-screws  $d$   $d$ , which operate against the blocks  $c$   $c$ , in the usual way.

In front of the rolls is a pair of scrapers,  $e$   $f$ . The lower scraper,  $e$ , is a double one, being two scrapers or blades set in a frame,  $e'$ .

The frame  $e'$  is fastened to the housing  $a$  and lies parallel with the roll  $b$ .

The two blades of the double scraper  $e$  are set far enough apart to allow the scraper  $f$ , which moves up and down in a pair of ways,  $h$   $h$ , to pass down or exert its downward pressure in a plane passing between them.

Passing up from the movable scraper  $f$ , to which it is rigidly attached, is a piston-rod,  $i$ .

This piston-rod  $i$  passes up through a steam-cylinder,  $k$ , of the usual construction, in which operates a piston-head, also of the usual construction.

At the side of the cylinder  $k$  is a steam-chest,  $l$ , in which there is an ordinary steam-valve.

Steam is admitted into the chest through pipes  $m$ , shown in fig. 1.

The valve in the steam-chest  $l$  is operated by means of a valve-stem,  $n$ , which is connected, by the lever  $o$  and rod  $p$ , with a tripping-lever,  $q$ , pivoted at one end,  $q'$ , to the housing, and connected, between its ends, with a bearing,  $v$ , on the end of the upper roll  $b'$ .

Passing out of the cylinder  $k$ , and leading down to a point just over the path of the sheet where it passes into the rolls, is a small steam-pipe,  $s$ .

The operation of my machine is as follows:

A sheet, bar, slab, or plate of iron or steel, or other metal to be rolled, is passed to the rolls, over the lower scrapers  $e$ , the scraper  $f$  being raised whenever the rolls are not in actual operation, and until the iron enters the bite. As the roll  $b'$  rests upon the roll  $b$ , the sheet, passing between them, raises or pushes the movable roll  $b'$  up in the housing  $a$ . This raises the lever  $q$ , and, through the lever  $o$  and rod  $p$ , presses down the valve-stem  $n$  and the valve in the steam-chest  $l$ . This opens the ports and admits steam into the cylinder  $k$  above the piston therein, where it forces the piston down, and, as the scraper  $f$  is firmly fastened to the end of the piston-rod  $i$ , it is pressed down firmly upon the upper surface of the sheet, bar, or plate.

The downward stroke may be limited by stops, if so desired.

The rolls, having taken a bite upon the iron, sheet, or plate before the scraper  $f$  comes down upon it, draw it through between the scrapers, which remove the scale from the plate as it passes between them.

The position of the scrapers  $e$  and  $f$  may be reversed; the double scraper  $e$  may be the upper or movable one, and the scraper  $f$  the lower or fixed one, if desired; or both scrapers may be double or single-bladed; or the upper scraper may be stationary and the lower one movable, in which latter case a stroke should be given to the piston the reverse of that described; or a reverse motion communicated in other known ways.

The pipe  $s$  is for the purpose of blowing the scale from the sheet after it has passed the scrapers by means of a steam-jet taken from the steam-cylinder. This is to prevent the scale lying on the sheet from passing through the rolls and so injuring the polish or finish of the sheet.

After the sheet has passed through the rolls the upper roll drops down upon the lower roll, depresses the lever  $q$ , and, through the levers  $p$  and  $o$ , raises the valve-stem  $n$  and with it the valve. This opens the lower ports, admits the steam into the cylinder  $k$  un-



der the piston, which raises the piston and with it the scraper *f*, when the machine is ready for another turn; also, the piston, at its upward stroke, covers and closes the port leading to the pipe *s*.

It will be observed that, in the mechanical operation described, the upper roll, arranged in the path of the plate, sheet, slab, or bar, performs the function of a tripper, and, through an arrangement of levers, gives the desired throw to the steam-valve in the valve-chest. Instead of this the rolls, as in the rolling of bar-iron or slabs, may be set at a fixed distance apart, and any other suitable tripping device of like function may be arranged in the path of the plate, sheet, bar, or slab, and, being connected with the valve-stem, the latter may thereby be automatically moved or thrown at the desired moment and with the desired length of throw; and such modifications I include in my invention.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In combination with a pair of rolls, a scraping device adjacent thereto, a steam-cylinder and piston, and suitable mechanism connecting the upper one of said rolls with a valve of the steam-cylinder, and a piston-rod connecting the piston of the steam-cylinder with such scraping device, substantially as described.

2. The steam-pipe, communicating at one end with the interior of the steam-cylinder, and terminating at the other end above the path of the plate to be rolled, and between the scrapers and the rolls, substantially as and for the purpose described.

In testimony whereof I, the said CHRISTOPHER ZUG, have hereunto set my hand.

Witnesses: CHRISTOPHER ZUG.

A. S. NICHOLSON,  
G. H. CHRISTY.