

No. 743,766.

PATENTED NOV. 10, 1903.

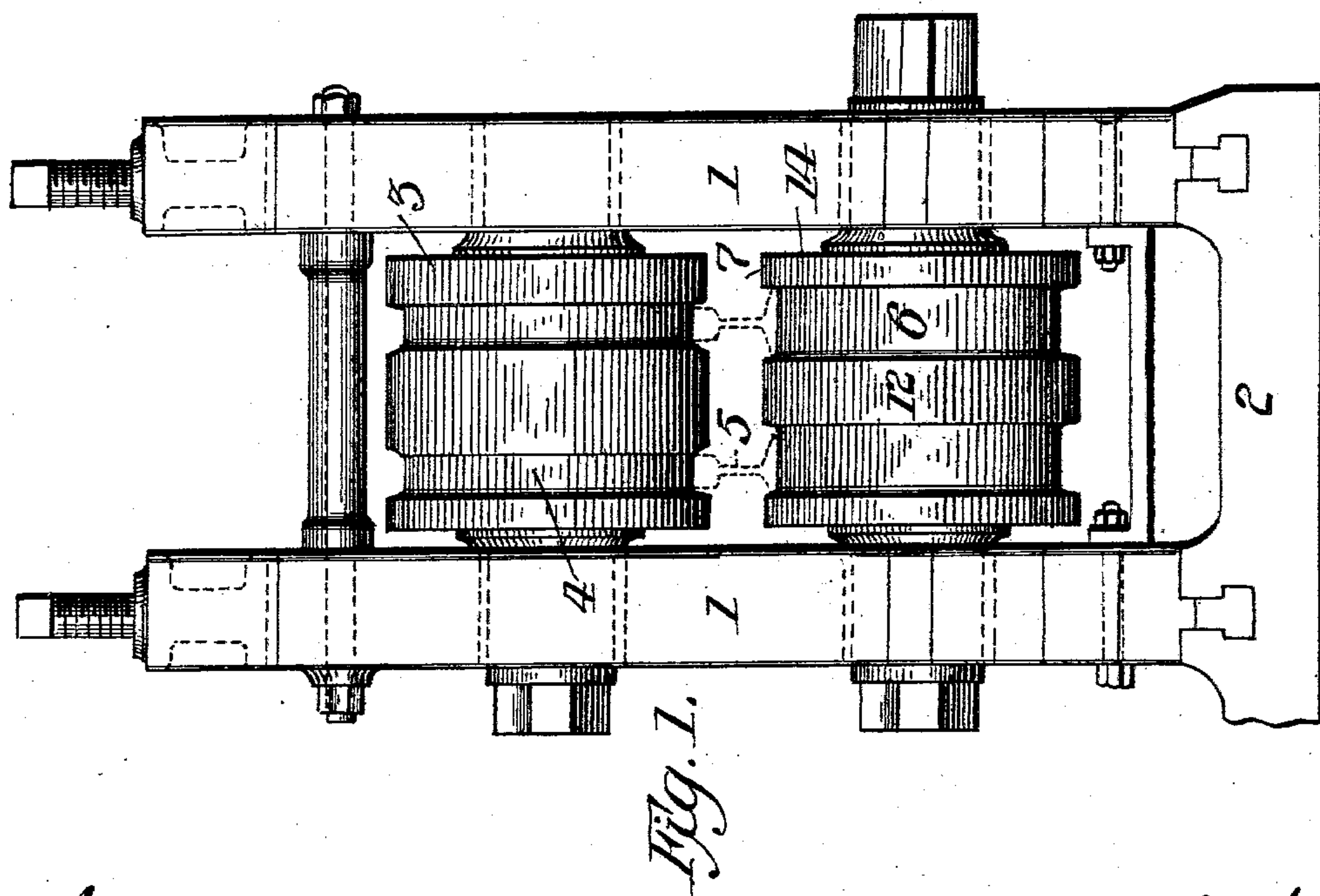
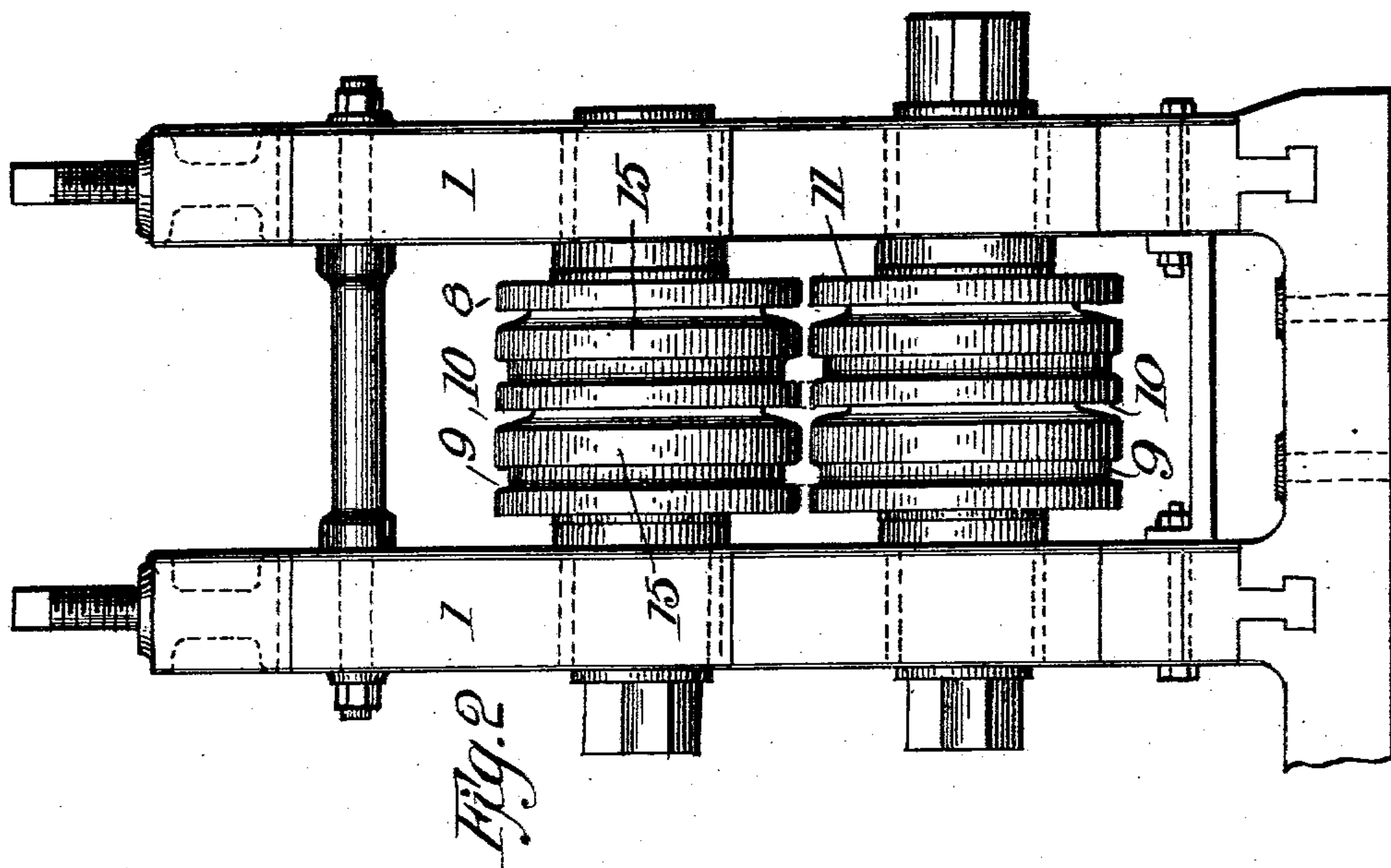
J. SMITH.

APPARATUS FOR STRAIGHTENING RAILS OR BARS.

APPLICATION FILED JULY 18, 1903.

NO MODEL.

3 SHEETS—SHEET 1.



Witnesses:
L. H. Butler,
E. E. Potter,

Inventor
James Smith,
By W. C. Everett & Co.
Attorneys.

No. 743,766.

PATENTED NOV. 10, 1903.

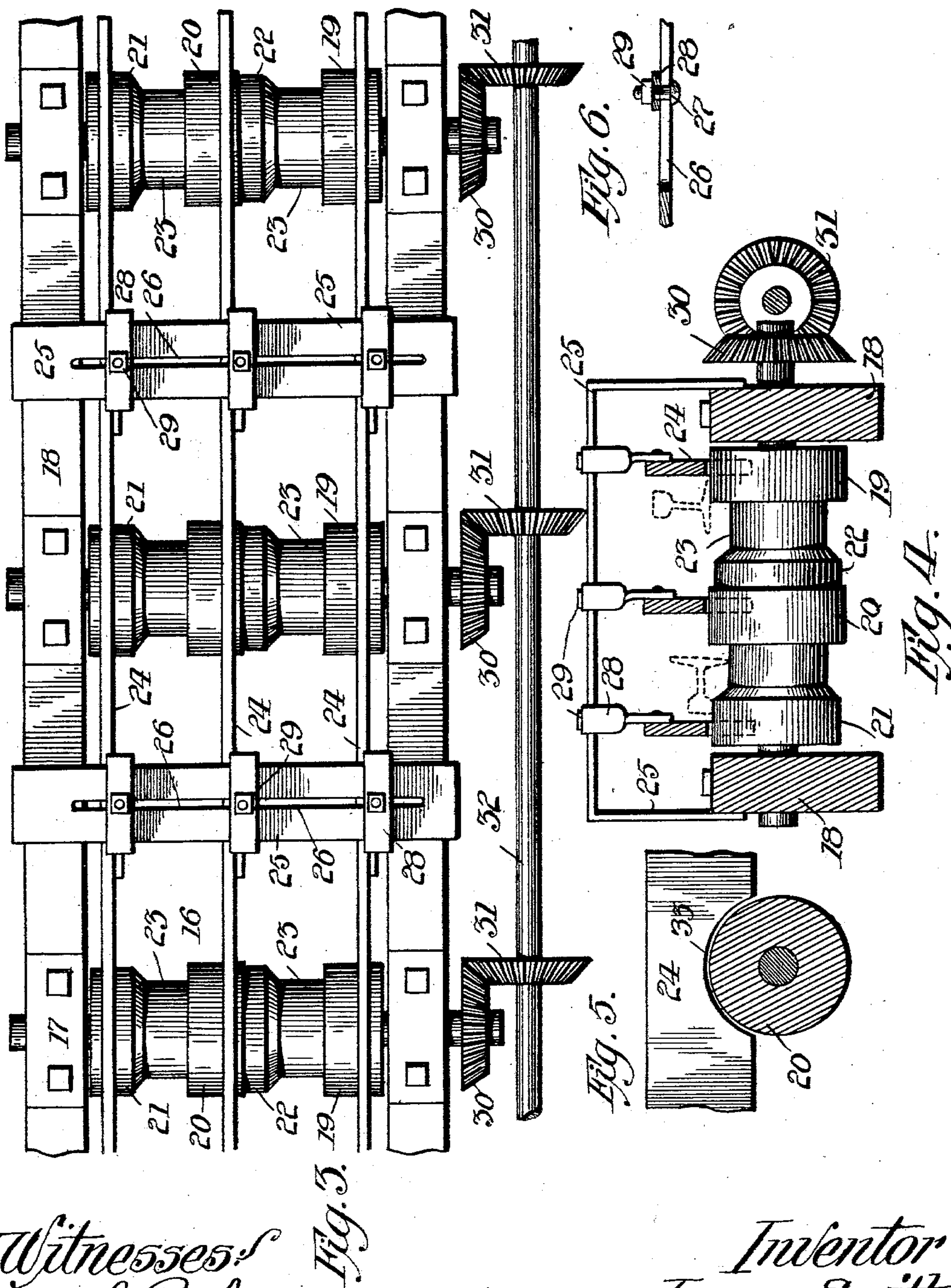
J. SMITH.

APPARATUS FOR STRAIGHTENING RAILS OR BARS.

APPLICATION FILED JULY 18, 1903.

3 SHEETS—SHEET 2.

NO MODEL.



Witnesses:
J. H. Butten,
D. E. Potter.

Inventor
James Smith,
By N. C. Evers & Co.
Attorneys.

No. 743,766.

PATENTED NOV. 10, 1903.

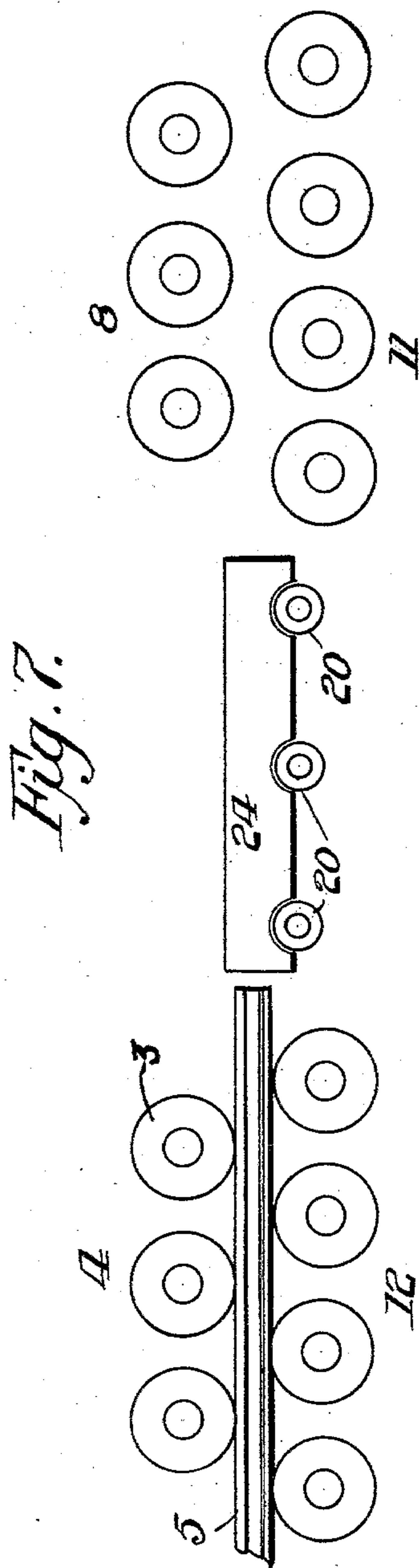
J. SMITH.

APPARATUS FOR STRAIGHTENING RAILS OR BARS.

APPLICATION FILED JULY 18, 1903.

3 SHEETS—SHEET 3.

NO MODEL.



Witnesses:
A. H. Butler
E. E. Potter.

Inventor
James Smith
By W. C. Everett & Co.
Attorneys.

UNITED STATES PATENT OFFICE.

JAMES SMITH, OF PITTSBURG, PENNSYLVANIA.

APPARATUS FOR STRAIGHTENING RAILS OR BARS.

SPECIFICATION forming part of Letters Patent No. 743,766, dated November 10, 1903.

Application filed July 18, 1903. Serial No. 166,074. (No model.)

To all whom it may concern:

Be it known that I, JAMES SMITH, a citizen of the United States of America, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Apparatus for Straightening Rails or Bars, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to certain new and useful improvements in straightening-mills, and has for its object the provision of means for passing iron or steel bars or rails through a set of rolls for bending the bars or rails vertically and automatically turning the bars or rails, whereby they are entered into another set of rolls for bending the same horizontally in order to perfectly straighten the bars or rails from end to end thereof.

A further object of the present invention is to provide guides in connection with the automatic turning-rolls, which guides may, if desired, be made adjustable whereby to set the same to conform to the size of the bar or rail being straightened.

Briefly described, the invention comprises a set or plurality of rolls which are provided with suitable passes that receive the rails inserted therein in the upright or vertical position of the rails. The rails are discharged from this first set of rolls onto a plurality of combined guide and turn rolls. The rails on these turn-rolls are so positioned that when the rails leave the first set of straightening-rolls and rest entirely upon the guide and turn rolls they automatically assume the horizontal position, in which manner they are inserted into the second set of straightening-rolls, which straighten the rails in the horizontal position. The combined guide and turn rolls are positioned intermediate or between the first set of straightening or bending rolls and the second set of straightening or bending rolls, and in practice the three sets of rolls are preferably driven each independently.

Other details enter into the invention, and these, together with those above mentioned, will be hereinafter more fully described, and specifically pointed out in the claims, and in describing the invention in detail reference

is had to the accompanying drawings, forming a part of this specification, and wherein like numerals of reference indicate like parts throughout the several views, in which—

Figure 1 is a front elevation of the first set or plurality of rolls for bending or straightening the bars or rails vertically. Fig. 2 is a like view of the set of rolls for bending or straightening the rails horizontally. Fig. 3 is a top plan view of the combined guide and turn rolls, showing their supporting-beams and drive-shaft broken away. Fig. 4 is a transverse vertical sectional view of the same. Fig. 5 is a transverse sectional view of one of the guide and turn rolls, showing a part of the adjustable guide. Fig. 6 is a horizontal sectional view of a part of one of the supports for the adjustable guides, and Fig. 7 is a diagrammatical view illustrating the manner in which the various rolls are positioned to receive the rails or bars for straightening.

The main object of my invention is the provision of a set of rolls for straightening rails vertically, guide and turn rolls to receive the rails as they pass from the first set of bending or straightening rolls, and a set of rolls for receiving the rails from the guide and turn rolls and straighten them horizontally.

To put my invention into practice, I provide housings 1, mounted upon a base 2 of the ordinary form of construction. In these housings 1 are mounted the upper rolls 3 of the first set of rolls, which upper rolls are provided with grooves 4 to receive the tread of the rails 5. The base of the rails is received in grooves 6, formed in the lower rolls 7, which are journaled in the housings. As in the usual manner, the upper rolls are made adjustable, so as to vary the size of the pass between the upper and lower rolls to conform to the size of the bar or rail being rolled. In practice I preferably employ four lower rolls and three upper rolls, though, of course, I do not wish to limit myself to this number of rolls; but I do prefer to dispose these rolls in a manner as shown in Fig. 7 of the drawings—that is, with the upper rolls disposed above the space between each two adjacent lower rolls. The rolls for bending or straightening the rails in the horizontal position comprise a series of upper rolls 8, having grooves 9 and

10 to receive the part of the rail-tread and a part of the rail-base, the lower rolls 11 having similar grooves to also receive a part of the rail-tread and a part of the rail-base. In the rolls 7 of the first mill or set of rolls the rail-base is held between the central collar 12 and the end collars 14, while in the rolls 8 and 11 the collars 15, which are between the grooves 9 and 10, engage with the web of the rail, whereby to straighten the latter as the rail is passing through the last set of rolls. The rolls 10 and 8 are journaled in housings 1 of the same form of construction as the housings for the first set of rolls. Interposed between the first set of rolls and the last set of rolls just described are the guide and turn rolls, which receive the bar or rail from the first set of rolls and automatically turn the same and feed the bar or rail to the last set of rolls. To this end a series of guide and turn rolls 16 have their necks journaled in suitable boxes or bearings 17, mounted on supporting-beams 18. These guide and turn rolls are formed with a collar 19 at one end, a central collar 20, a collar 21 at their other end, a collar 22 adjacent to the collar 21, and peripheral grooves 23. The collars 21 22 are of equal diameter. The rails or bars as they pass from the first set of rolls are received upon the collars 19 and 20 and are received in such a position that when free from the first set of rolls the rail or bar will automatically turn on its side to enter the second set of rolls. To accomplish this end, I provide guides 24, suspended above the collars 19 and 20 and 21. These guides are preferably made adjustable, and a convenient method of supporting the same and adjusting them is that shown in the accompanying drawings, which consists of a yoke 25, attached to the supporting-beams 18. The top bar of this yoke is provided with a longitudinal slot 26, in which is secured the bolt 27, which carries the hangers 28, to which the guides 24 are attached. It will be observed that by loosening nut 29 of the bolt 27 the hanger and bolt may then be shifted along the slot, so as to vary the position of the guides 24 over the collars, thereby increasing or decreasing the distance between the side face of said guides and the edge of the respective collars.

In Fig. 4 of the drawings on the right hand of the view is shown in dotted lines the position of the rail as it is received on collar 19, and on the left hand of the view is shown in dotted lines the position of the rail after it has fallen over to be received horizontally in the last set of rolls. It will be observed that one edge of the base of the rail rests on the bottom of the groove 23, while the one side of the rail-tread rests upon the collar 21. It will also be observed that the other rail or bar and one side of the rail-tread would rest upon the collar 22. The rail is automatically turned, for the reason that the guides 24 are so positioned that a greater portion of the

weight of said rail is overhanging the edge of collars 19 and 20 and as soon as the rail clears the last of rolls 3 and 7 it automatically turns into the horizontal position to be received in the second set of rolls. These guide and turn rolls are provided at one end with beveled gears 30, which mesh with bevel-gears 31 on the drive-shaft 32. This drive-shaft 32 is driven in any suitable manner, as are also the rolls of the first and also those of the second or last set, and in practice I preferably drive each set of rolls independently and also drive the guide and turn rolls independently, whereby each series of rolls may be driven at any desired speed. The guides 24 are provided with segment cut-out portions 33 to receive the collars of the rolls, as clearly seen in Fig. 5.

In the present illustration of my invention I have illustrated the same and described it as particularly adapted for the straightening of railroad-rails; but it is to be noted that the same is applicable alike to bars of any form, the grooves being shaped accordingly. With my invention it is to be observed that the only handling of the rolls required is that of inserting the same into the first set of rolls, from which they are received onto the guide and turn rolls, are there automatically turned on their side, and the guide and turn rolls act to feed the rails into the second set of straightening or bending rolls.

While I have described and shown my invention as practiced by me, yet it will be obvious that various changes may be made in the details of construction without departing from the general spirit of my invention.

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

1. In a machine for straightening rails and the like, the combination with two sets of straightening or bending rolls, one of which receives the rails in the vertical position and the other of which receives the rails in the horizontal position, of guide and turn rolls interposed between the two sets of straightening or bending rolls to receive the rails from the first set of rolls, and automatically turn the same into position for entry into the second set of rolls, substantially as described.

2. In a machine for bending rails and the like, the combination with two sets of rolls, one of which receives the rails in the vertical position and the other of which receives the rails in the horizontal position, of guide and turn rolls interposed between the said two sets of rolls to receive the rails from the first set of rolls and automatically turn the same into position for entry into the second set of rolls, adjustable guides supported above the guide and turn rolls, and driving means for said rolls, substantially as described.

3. In a machine for bending rails and the like, the combination with two sets of bending or straightening rolls, of a plurality of

5 guide and turn rolls interposed between the said sets of straightening or bending rolls, said guide and turn rolls acting to automatically turn the rails when received from the first set of rolls into position for entry in the second set of rolls and to feed the same therein, substantially as described.

In testimony whereof I affix my signature in the presence of two witnesses.

JAMES SMITH.

Witnesses:

A. M. WILSON,
E. E. POTTER.