

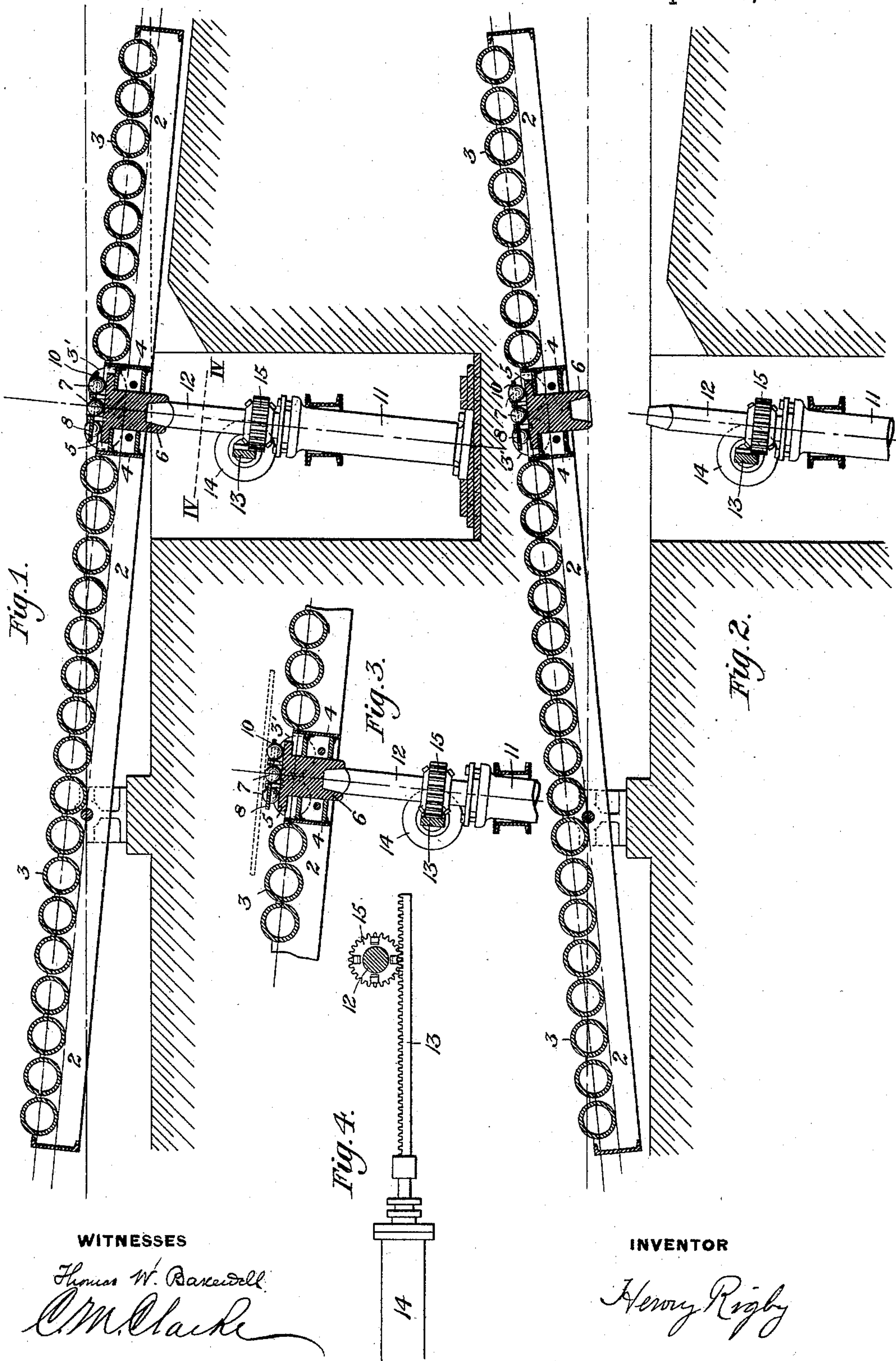
(No Model.)

2 Sheets—Sheet 1.

H. RIGBY.
ROLLING MILL APPLIANCE.

No. 495,683.

Patented Apr. 18, 1893.



WITNESSES

Thomas W. Baxendell
C. M. Clarke

INVENTOR

Henry Rigby

(No Model.)

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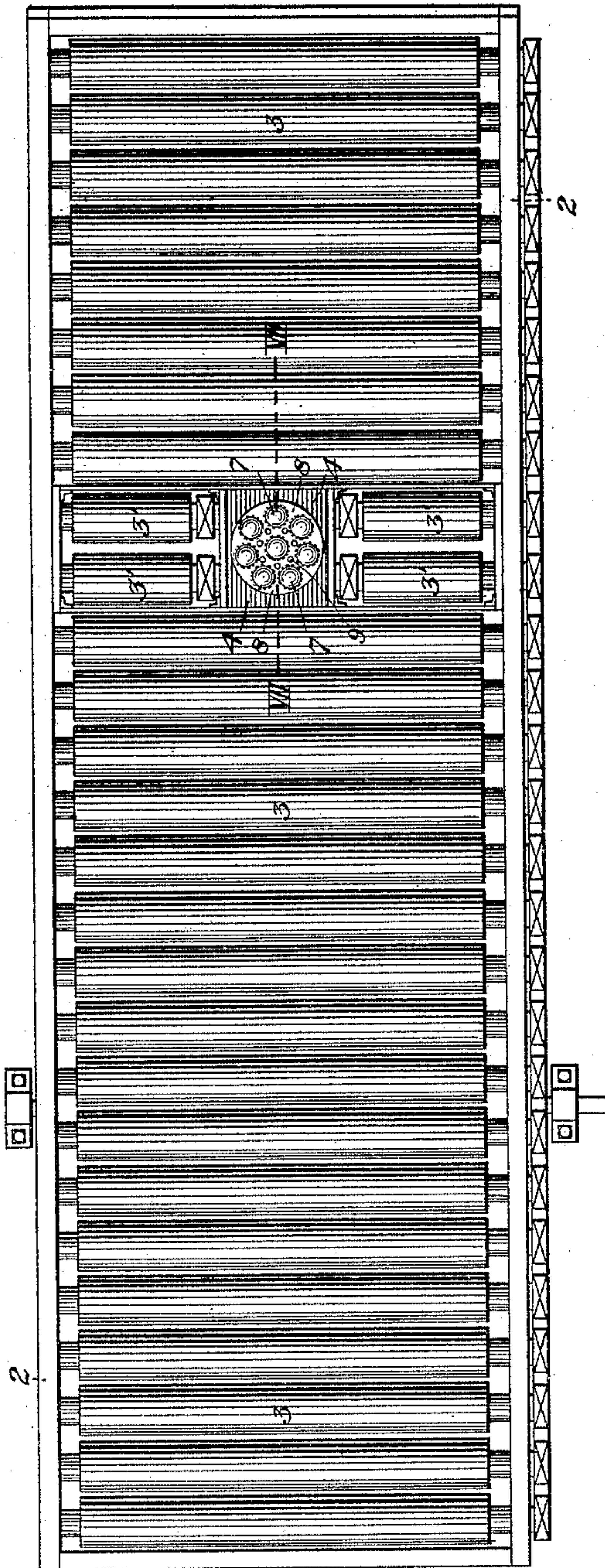


Fig. 5.

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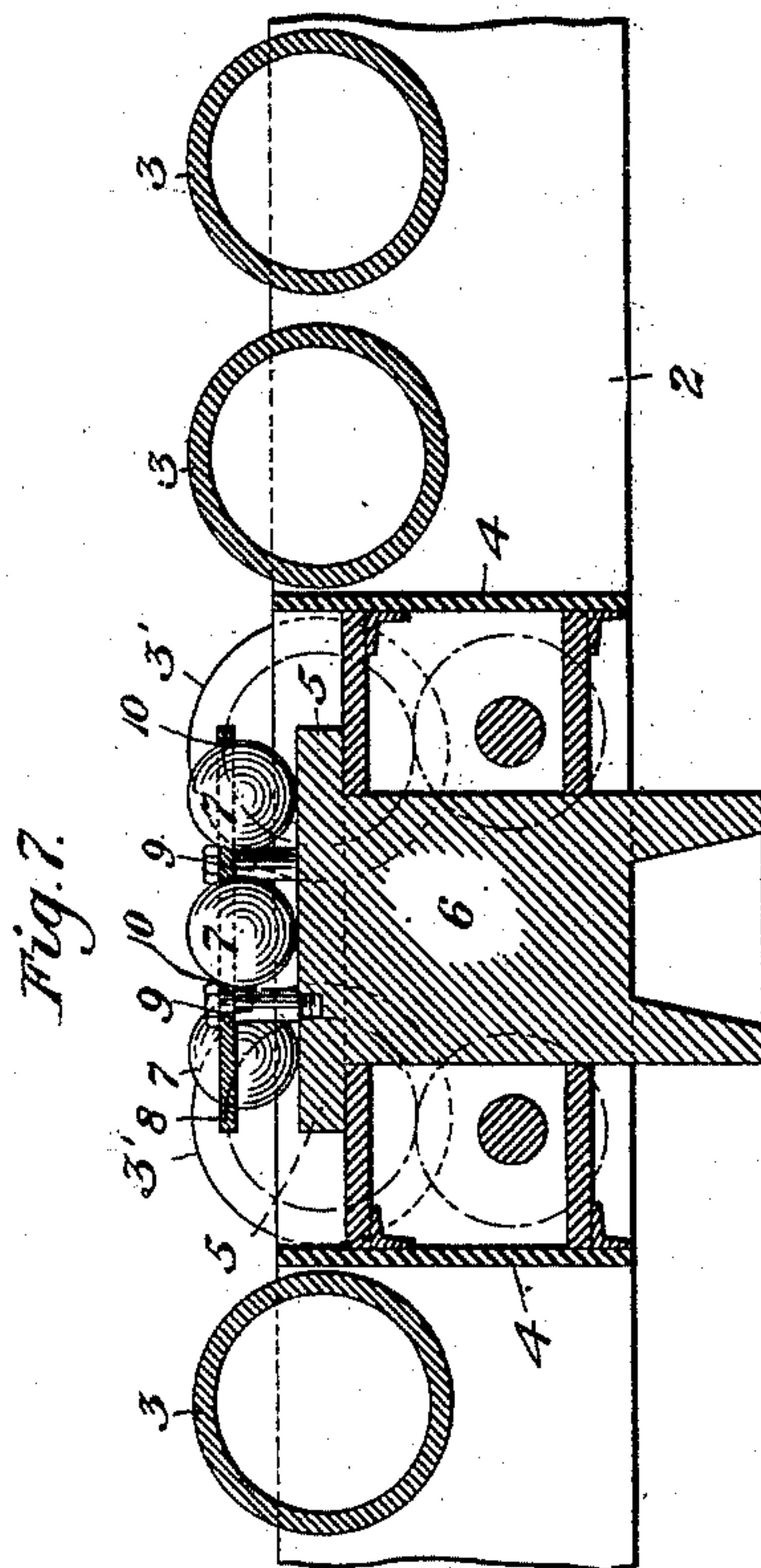


Fig. 7.

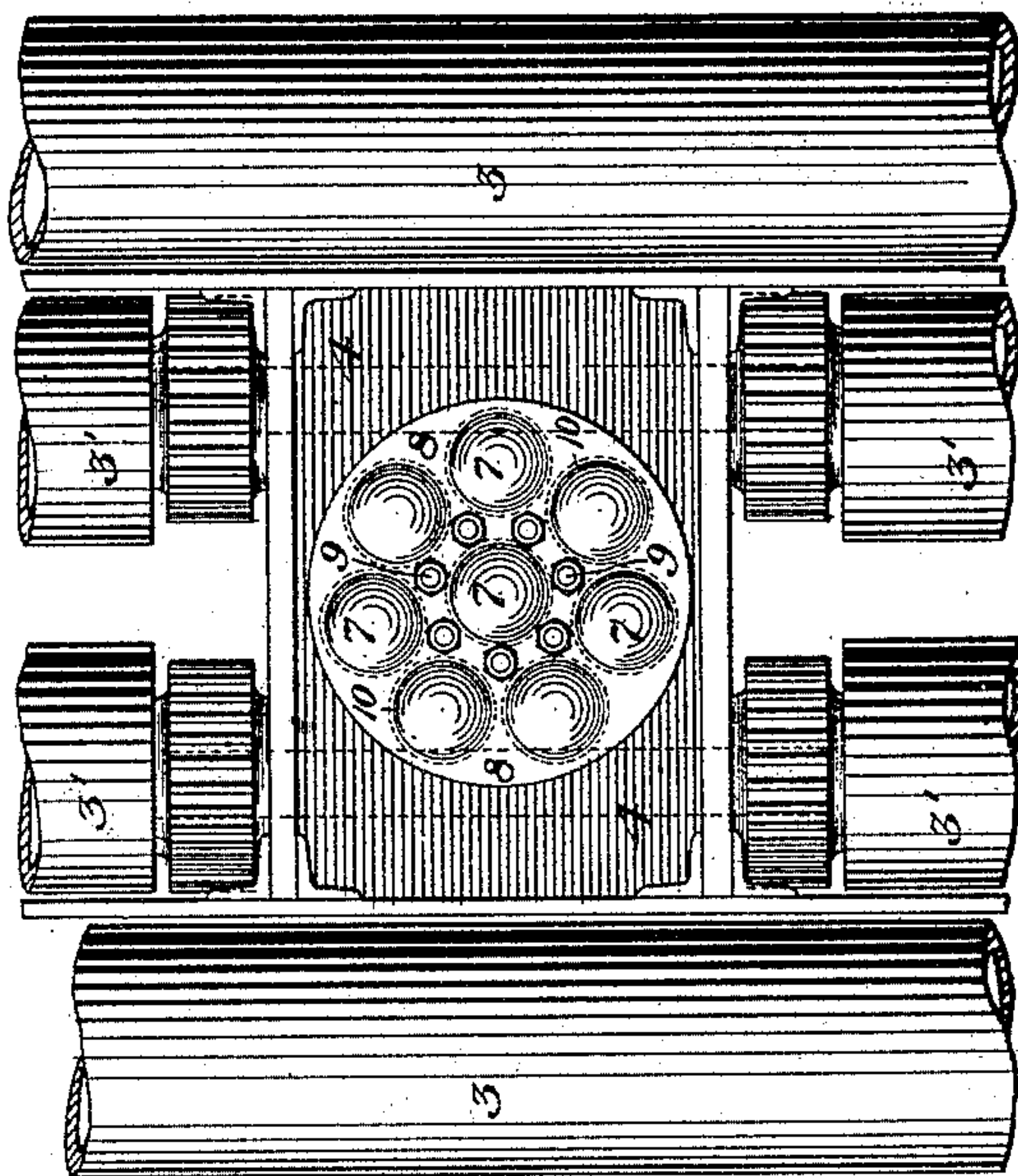


Fig. 6.

INVENTOR

Henry Rigby

UNITED STATES PATENT OFFICE.

HENRY RIGBY, OF PITTSBURG, PENNSYLVANIA.

ROLLING-MILL APPLIANCE.

SPECIFICATION forming part of Letters Patent No. 495,683, dated April 18, 1893.

Application filed November 21, 1892. Serial No. 452,665. (No model.)

To all whom it may concern:

Be it known that I, HENRY RIGBY, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Rolling-Mill Appliances, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

10 Figure 1 is a vertical longitudinal section of a rolling-mill feed-table embodying my invention, the table being shown with its inner end opposite to the lower pass of the rolls. Fig. 2 is a similar view, showing the inner end
15 of the table elevated into a position opposite to the upper pass of the rolls. Fig. 3 is a partial view of the feed-table, similar to Fig. 1, but showing the turning device elevated so as to lift the metal above the surface of the
20 feed-rollers. Fig. 4 is a detail view, showing in plan the mechanism by which the metal-turning device is rotated. Fig. 5 is a plan view of the feed-table. Fig. 6 is a partial plan view, showing the metal-turning device
25 on a larger scale. Fig. 7 is a vertical section on the line VII—VII of Fig. 5, but on a larger scale.

Like symbols of reference indicate like parts in each.

30 The object of my invention is to provide convenient means by which metal plates, or other metal pieces, can be turned horizontally upon the feed-table of a rolling-mill by mechanical means, thereby dispensing with the
35 cost and trouble of employing the manual labor heretofore required for that purpose.

To that end my invention consists principally in the combination with a mill-feed table, of a turn-table or platform carried by and
40 adapted to be raised above the level of the feed-table to lift the metal therefrom, and adapted to be rotated in order to turn the metal, and to change the end of the piece which is delivered to the rolls.

45 My invention also consists in certain new constructions and arrangements hereinafter described, and concisely summarized in the claims.

50 In the drawings, 2 represents the feed-table of a rolling mill. This is illustrated as being a tipping table, vertically movable on a horizontal axis, so as to transfer its inner

end from the lower to the upper roll-passes and vice versa, but my invention may be applied as well to tables which move vertically in
55 right lines and not radially.

The mechanism for lifting the table is not shown in the drawings, but I illustrate in Figs. 1 and 2 respectively the table in its lowest and in its most elevated positions. 60

3 are the usual feed-rollers of the table, journaled in suitable bearings, and provided with gearing by which they may be driven so as to move the metal on the table to or
65 from the rolls.

At an intermediate portion of the table there is a frame 4, which contains the turn-table, hereinafter described. I prefer that this frame should be set in the longitudinal middle line of the table, and that the rollers at
70 this place be divided as at 3', the divided rollers being shorter than the others and their inner ends journaled in the longitudinal side portions of the frame. These rollers are also
75 provided with gearing, as shown, so that they may be rotated with the other rollers 3 of the feed-table.

5 is a plate, having a downwardly projecting post or shank 6 fitting in a vertical guideway in the frame 4. On the surface of the
80 plate is a series of balls 7, held in position so that they may be free to rotate by a retaining plate 8, elevated above the plate 5 by bolts 9, and provided with holes 10, within which the balls fit and above which they project. 85
The post 6 is vertically movable so as to elevate the balls 7 from their normal position at the level of the rollers 3, 3', to a position above said level, and to lift therewith any metal pieces which may be resting upon said balls. 90
This lifting of the turn-table is effected when the feed-table is in its lowest position, and is accomplished by the following mechanism: 95
11 is a lifting-cylinder set below the turn-table, and, when used with a radially-movable feed-table, set at an inclination to the vertical, as shown in the drawings. 12 is the projecting plunger of said cylinder which fits in a socket at the base of the post 6, when the table is in its lowest position, and 13 is a
100 toothed rack connected to the plunger of a hydraulic cylinder 14, and in gear with a pinion 15 on the plunger 12, so that on projecting said rack the plunger 12 and the post 6

into which it fits may be turned on their longitudinal axis. The plunger 12 may be projected somewhat from the cylinder 11, so as to raise the post 6 within the frame 4, and to lift the turn-table, with its balls, above the level of the feed-table, and the gearing between the rack 13 and pinion 15 is such that the projection of said plunger will carry the pinion with it without interrupting the mechanical connection between the rack and pinion.

The operation of the device above described is as follows:—If it is desired to turn the metal piece which is being passed by the feed-table to and from the rolls, the feed-table being brought to its lowest position, the socket in the post 6 fits upon the plunger 12. The piece is then brought by the rollers 3 directly above the balls of the turn-table, and is there stopped. The plunger 12 is then elevated by admitting motive fluid into the cylinder 11, and the metal piece is thereby lifted above the feed-table rolls 3; the rack 13 is then moved longitudinally, and has the effect of rotating the plunger 12 with the post 6 upon their vertical axis, and thus turning the piece supported by the balls of the turn-table; the plunger 12 is then retracted, bringing the now turned piece down again upon the rollers of the feed-table, leaving it in position where it may be advanced to the rolls by rotation of the feed-table rollers. When the feed-table is elevated in the usual operation of the mill, the post 6 is lifted from the plunger 12, as shown in Fig. 2, but when the table is again lowered the post and plunger are automatically brought into connection and are in position to lift and turn the turn-table, as above explained. The operation of turning the piece is thus accomplished entirely by mechanical means and time and labor in the operation of the mill are saved. The advantage of employing the balls to constitute the bearing surface of the turn-table and of dividing the feed-rollers at the position of the turn-table is that the table may not be interrupted, and that in the normal operation of the table the metal piece may be supported by a rotatory surface, the balls being adapted to rotate conformably to the longitudinal motion of the metal in whatever position the turn-table may be. It will be understood, however, that although I make specific claim to these improved constructions, the broader claims of the specification are not limited thereto, since either or both of these constructions may be omitted without forfeiting all of the advantages of my invention.

Other changes in the construction and arrangements of the parts may be made by those skilled in the art without departure from my invention as defined in the claims.

The turning mechanism may be applied to the table at both sides of the rolls, or to the table at one side of the rolls only.

The advantages derived from carrying the turning mechanism by the feed-table, instead of making it a quite independent structure, will be appreciated by those skilled in the art. Among these advantages is the fact that it renders the mechanism simpler and enables me to accomplish the result without making inconveniently wide open gaps between the rollers of the table.

I claim—

1. The combination of a feed-table and a turn-table set therein and carried thereby, and mechanism for rotating said turn-table; substantially as described.
2. The combination of a vertically movable feed-table, a turn-table set therein and carried thereby, a motor for lifting said turn-table, and rotating mechanism; substantially as described.
3. The combination of a feed-table, a turn-table set therein, a lifting-motor below the feed-table, and a detachable connection between the lifting-motor and turn-table; substantially as described.
4. The combination of a vertically movable feed-table, a turn-table therein, a cylinder and plunger below the turn-table for lifting the same, and a detachable connection between the plunger and turn-table; substantially as described.
5. The combination of a feed-table, a turn-table set therein, and having feed-rollers at its side; substantially as described.
6. The combination of a feed-table, a turn-table set in a frame therein, and having feed-rollers at both sides connected by gearing; substantially as described.
7. The combination of a feed-table and a turn-table set therein, and having rotary surface balls; substantially as described.
8. The combination of a feed-table, a turn-table having rotary surface-balls, and mechanism for turning the same; substantially as described.

In testimony whereof I have hereunto set my hand this 24th day of October, A. D. 1892.

HENRY RIGBY.

Witnesses:

W. B. CORWIN,
H. M. CORWIN.