

(No Model.)

2 Sheets—Sheet 1.

P. F. HANLEY & F. M. RICHEY.
FEED TABLE FOR ROLLING MILLS.

No. 352,748.

Patented Nov. 16, 1886.

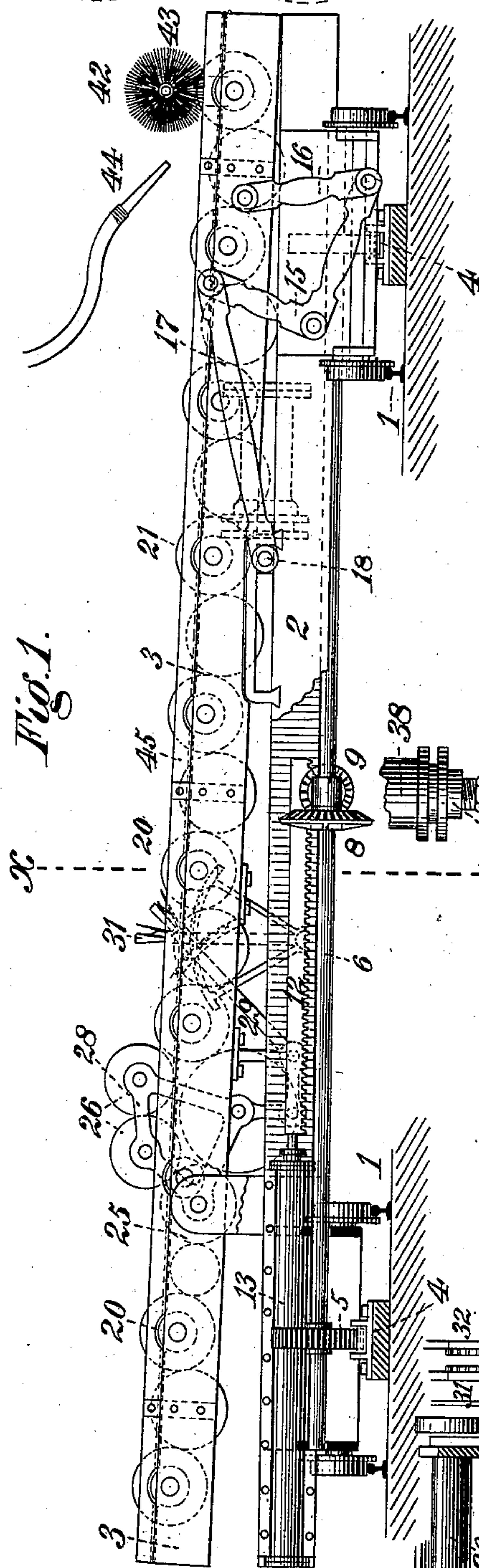


Fig. 1.

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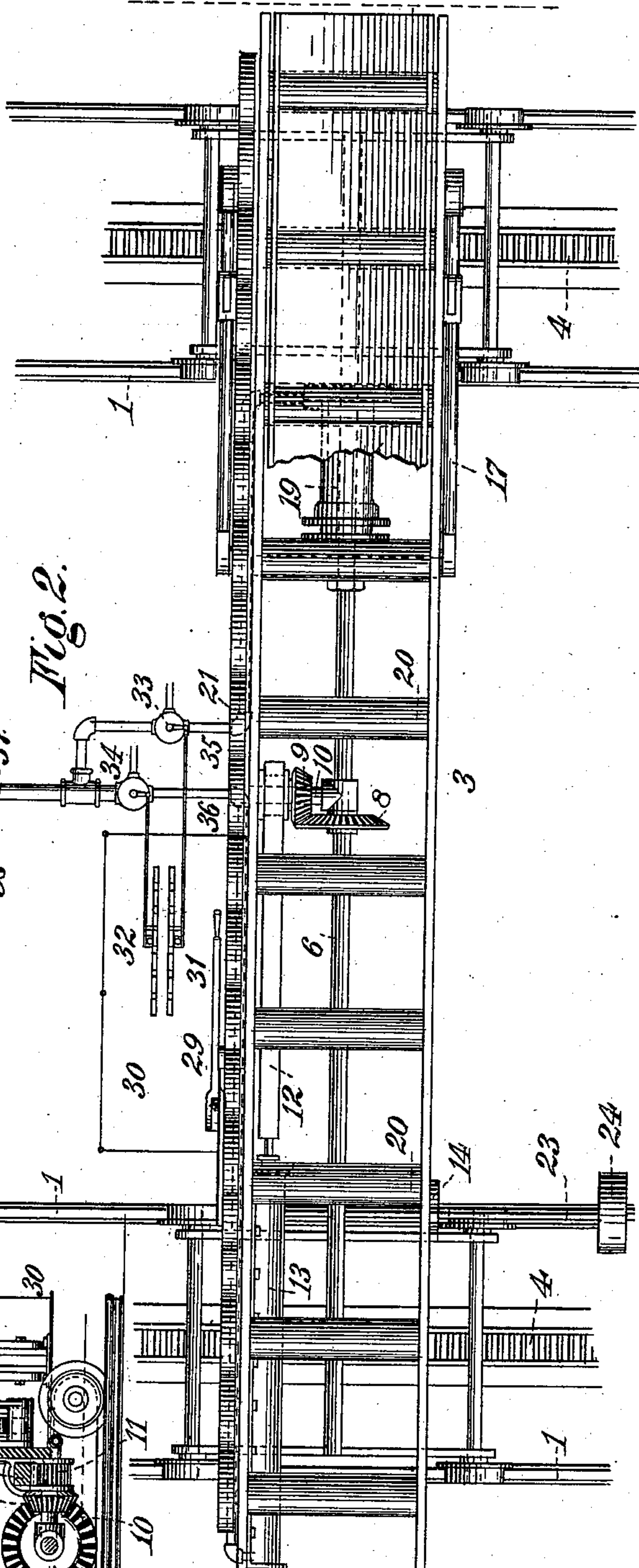


Fig. 2.

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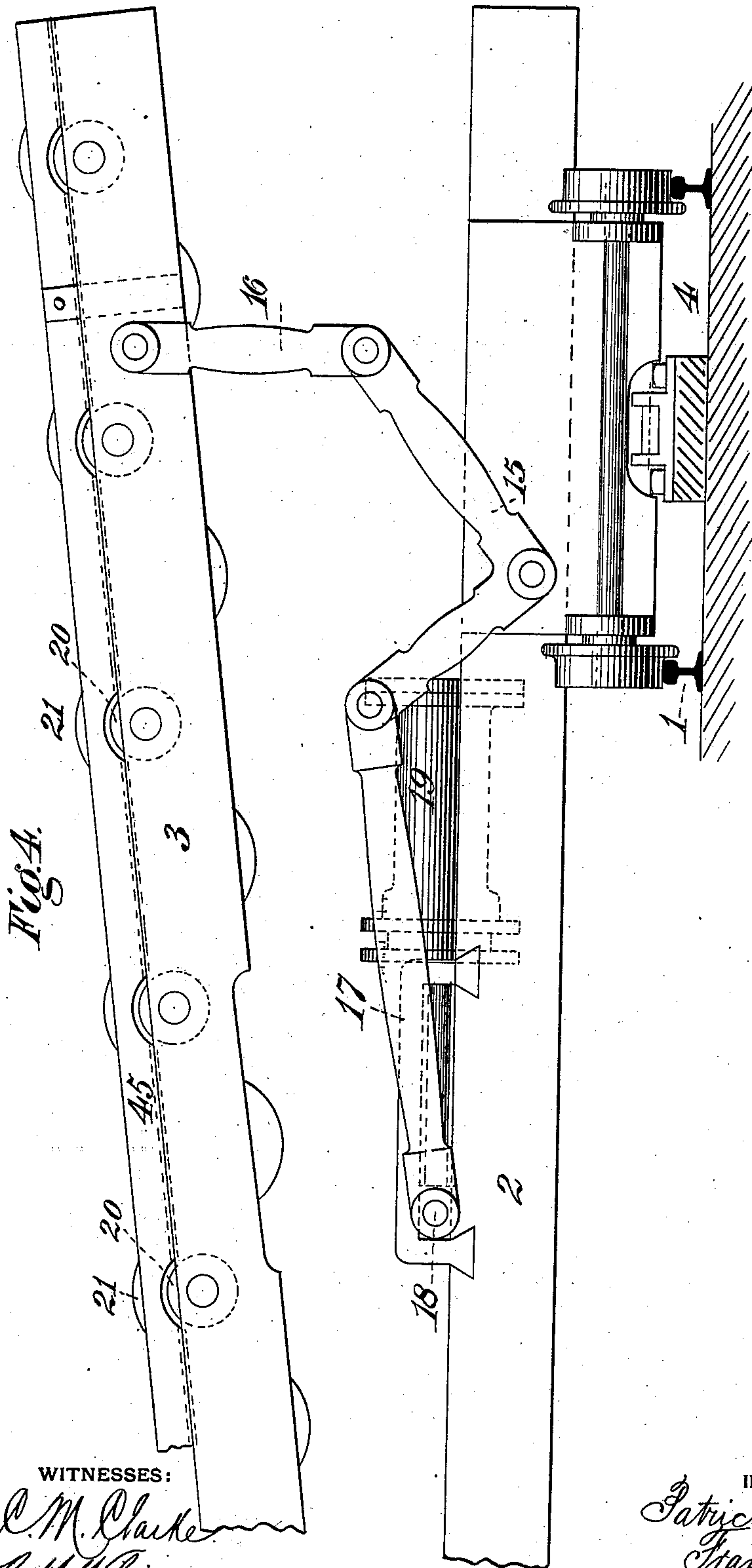


Fig. 4.

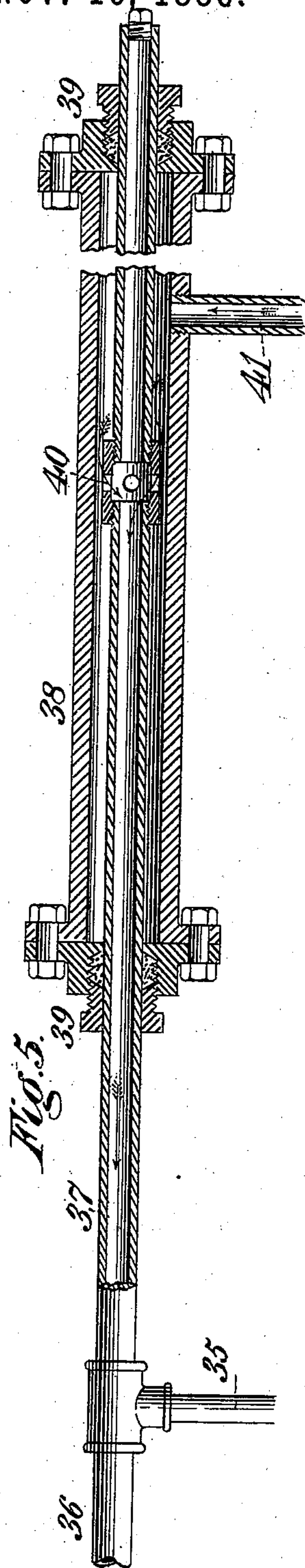


Fig. 5.

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UNITED STATES PATENT OFFICE.

PATRICK F. HANLEY AND FRANCIS M. RICHEY, OF HOMESTEAD, PA.

FEED-TABLE FOR ROLLING-MILLS.

SPECIFICATION forming part of Letters Patent No. 352,748, dated November 16, 1886.

Application filed August 25, 1886. Serial No. 211,778. (No model.)

To all whom it may concern:

Be it known that we, PATRICK F. HANLEY and FRANCIS M. RICHEY, residing at Homestead, in the county of Allegheny and State of Pennsylvania, citizens of the United States, have invented or discovered certain new and useful Improvements in Feed-Tables for Rolling-Mills, of which improvements the following is a specification.

10 In the accompanying drawings, which make part of this specification, Figure 1 is a view in side elevation of our improved feed-table for rolling-mills. Fig. 2 is a top plan view of the same. Fig. 3 is a transverse sectional view on the line *x x*, Fig. 1. Fig. 4 is a view in
15 side elevation, on an enlarged scale, showing the table-tipping mechanism. Fig. 5 is a sectional view of the expansible joint for the hydraulic-pipe connections.

20 In rolling heavy beams or structural shapes in three-high mills, it is necessary, during the back and forth passes of the articles, to raise the end of the article adjacent to the rolls, in order to feed it between the upper and middle
25 rolls, when feeding in one direction, and to lower said end in order to feed it between the middle and lower rolls when feeding in the opposite direction, and it is also necessary to move the article laterally in order to bring it
30 into line with different passes or grooves in the same set of rolls or the grooves in different sets. When these various movements are effected by attendants, and the articles being rolled are large, the labor is very severe, and
35 considerable time is lost, and when rolling beams irregular in cross-section it is impossible for the attendants to prevent the beam from bending or twisting out of shape as it comes from one pass, and it is difficult and
40 dangerous to feed such bent or twisted beams to the next pass.

The object of the invention herein is to provide mechanical means for effecting the various changes of position of the article being
45 rolled, and also to prevent the bending or twisting of beams of irregular shape in cross-section. And it is a further object of said invention to so arrange the mechanism that it may be operated from a stand or pulpit so located that the operator can readily determine
50 the various positions to which the tables are to be shifted.

To these ends the invention consists, in general terms, in the construction and combination of parts, substantially as hereinafter described 55 and claimed.

In carrying out our invention, two pairs or lines of rails 1 are arranged parallel with the axes of the rolls, (see Figs. 1 and 2,) and on these rails are placed trucks having suitable
60 flanged wheels, and to the trucks is secured a frame, 2, the trucks and frame forming a carriage for the support of the table 3. Between the lines or pairs of rails are arranged racks 4, with which pinions 5 intermesh, said pin-
65 ions being secured on a shaft, 6, mounted in suitable bearings on the under side of the frame 2. On the shaft 6, midway of its length, is secured a beveled pinion, 8, intermeshing with a beveled pinion, 9, on a short counter-
70 shaft, 10, mounted in suitable bearings, and on the counter-shaft is also secured a pinion, 11, intermeshing with rack 12, attached to the piston-rod of the hydraulic cylinder 13, also
75 secured to the frame 2. The back and forth movement of the rack effects a corresponding rotation of the shaft 6, through the medium of the mechanism hereinbefore described, and the rotation of the shaft effects a correspond-
80 ing back and forth movement of the carriage.

On each side of the frame 2, near the end farthest from the rolls, are secured uprights 14, to which is pivoted the table 3, said table being formed by plates connected together by
85 braces or bars. Bell-crank levers 15 are pivoted on each side of the frame 2, near its front end, one of the arms of each lever being connected by the links 16 to the table 3, (see Figs. 1 and 4,) the opposite arm of each lever being
90 connected by the rods 17 to the ends of the slide 18, said slide being arranged to move back and forth in suitable guides in the frame 2, and being connected at its middle point to the
95 piston of the hydraulic cylinder 19, mounted in the frame 2, as shown. As the slide 18 is moved back and forth by the piston of the hydraulic cylinder, the bell-crank levers 15 are
rotated on their pivots, and thereby raise or lower the front end of the table.

Between the side bars or plates of the table 100 3 are arranged a series of feeding-rolls, 20, having their journals mounted in said side plates. The journals at one end of said rolls project beyond the side plates, and have pin-

ions or friction-wheels 21 secured thereon, said pinions or friction-wheels engaging a series of pinions or friction-rollers, 22, suitably mounted between the pinions, as shown. In suitable bearings in the side plates of the table is mounted a shaft, 23, forming the pivot for the table, and extending parallel to the tracks and having a pulley, 24, secured thereon, said pulley being driven by a belt from any suitable source of power. On the shaft 23 is mounted a pinion or friction-wheel, 25, arranged to rotate with the shaft, but permitting the shaft to slide therethrough. Motion is transmitted from the pinion 25 to the series of pinions 21 by means of the intermeshing pinions 26 or the single pinion 27, said pinions 26 and 27 being mounted on a swinging frame, 28, pivoted to the table and operated by a lever, 29, whereby either the intermeshing pinions 26 or the pinion 27 may be brought into engagement with the pinion 25 and the next adjacent pinion of the series of pinions 21, thus providing for the rotation of the rolls in either direction, as required, by a shaft rotating in one direction.

To the frame 2, adjacent to the lever 29, is secured a platform or pulpit, 30, on which the operator may stand, and on the platform are located the levers 31 and 32, operating the valve mechanisms 33 and 34 in the pipes 35 and 36, leading to the hydraulic cylinders 13 and 19. These pipes 35 and 36 are connected at a point beyond the valve mechanisms to a pipe, 37, which passes through a tube or cylinder, 38, having stuffing-boxes 39 at its ends surrounding the pipe 37. The end of the pipe 37 opposite that connected to the pipes 35 and 36 is closed by a plug or other suitable means, and openings 40 are formed in that portion of the pipe inclosed within the tube 38, which is connected by a pipe, 41, to any suitable source of supply. This form of expansion-joint permits of perfect freedom of movement of the pipe 37, which is not subjected to any pressure of water in moving in either direction.

In order to remove the scale from the upper surface of the iron during rolling, a rotary brush, 42, is mounted in suitable bearings at the front end of the table, over the path of the article as it moves to and from the table, said brush being operated by a pinion of the series 21, a pinion, 43, on the shaft of the brush intermeshing with the front pinion of the series, as shown. If desired, a nozzle, 44, may be attached to the table, said nozzle being connected by a flexible pipe to a fan or other air-forcing apparatus. This nozzle, which is arranged to direct the air onto the article as it leaves the rolls, may be used with the brush, or independent thereof, as desired.

In order to straighten the beam and prevent its leaving the table, additional side bars, 45, extending above the surface of the feed-

rolls 20, are secured to the side plates of the table, as shown.

We claim herein as our invention—

1. In a rolling-mill plant, the combination of a laterally-moving carriage, a table provided with feed-rolls pivoted to the carriage, bell-crank levers pivoted to the carriage, each having one of its arms connected to the table, and means for rotating the bell-crank levers connected to the opposite arm thereof, substantially as set forth.

2. In a rolling-mill plant, the combination of a carriage, a table provided with feed-rolls pivoted to the carriage, and a hydraulic cylinder mounted on the carriage and arranged through interposed mechanism to move the carriage laterally, substantially as set forth.

3. In a rolling-mill plant, the combination of a carriage, a table provided with feed-rolls pivoted to the carriage, and a hydraulic cylinder mounted on the carriage and arranged through interposed mechanism to raise and lower the free end of the table, substantially as set forth.

4. In a rolling-mill plant, the combination of a carriage, a table provided with feeding-rolls pivoted to the carriage, and hydraulic cylinders mounted on the carriage and adapted through interposed mechanism to move the carriage laterally and to raise and lower the free end of the table, substantially as set forth.

5. In a rolling-mill plant, the combination of a carriage, a table provided with feed-rolls pivoted to the carriage, hydraulic cylinders mounted in the carriage and adapted to operate the carriage and table, as described, and an extensible pipe-connection from the cylinders to a suitable source of supply, substantially as set forth.

6. In a rolling-mill plant, the combination of a carriage, a table provided with feed-rolls pivoted to the carriage, hydraulic cylinders mounted on the carriage and adapted to operate the carriage and table, gearing for operating the feed-rolls, a platform secured to the carriage, and levers connected to the valves of the cylinders, and the gear-operating mechanism located in convenient proximity to the platform, substantially as set forth.

7. In a rolling-mill plant, the combination of a carriage, a table pivoted to the carriage, hydraulic cylinders located on the carriage for operating the table and carriage, a pipe connected to the cylinders at one end and having the opposite end closed, and a tight cylinder surrounding said pipe and connected to a suitable source of water-supply, the portion of the pipe within the cylinder being perforated, substantially as set forth.

In testimony whereof we have hereunto set our hands.

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