

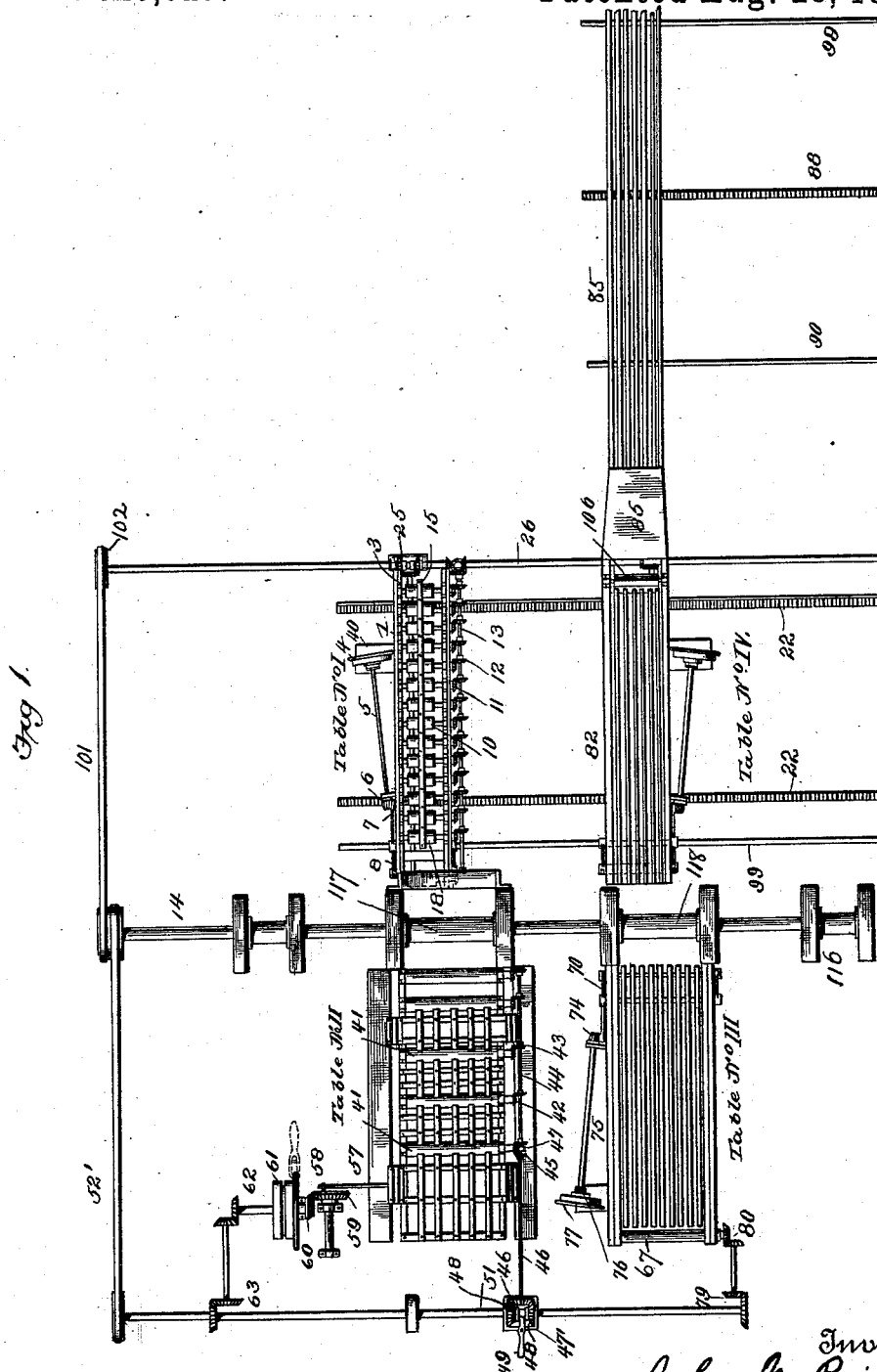
(No Model.)

6 Sheets—Sheet 1.

J. M. PRICE.
ROLLING MILL APPLIANCE.

No. 525,027.

Patented Aug. 28, 1894.



Witnesses

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Thos. E. Robertson

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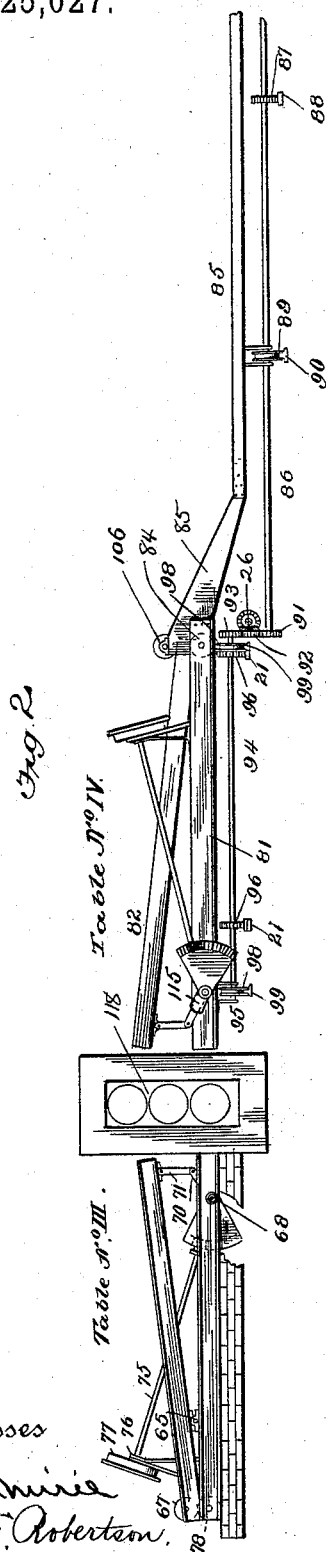
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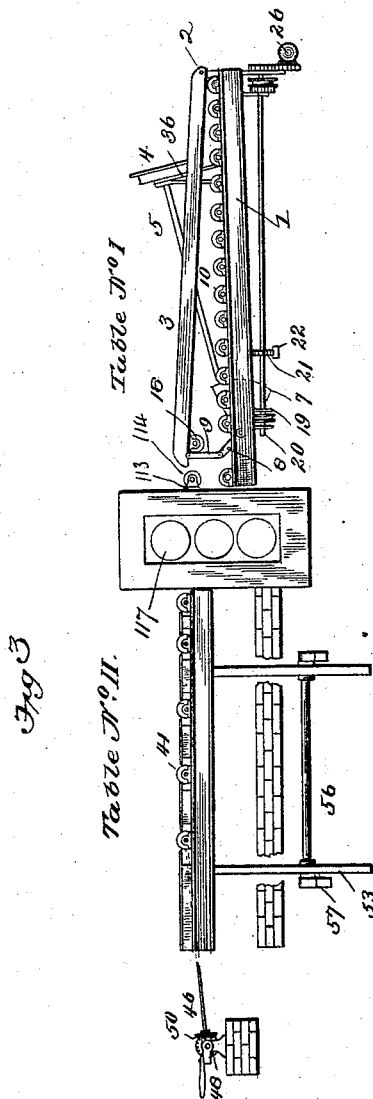
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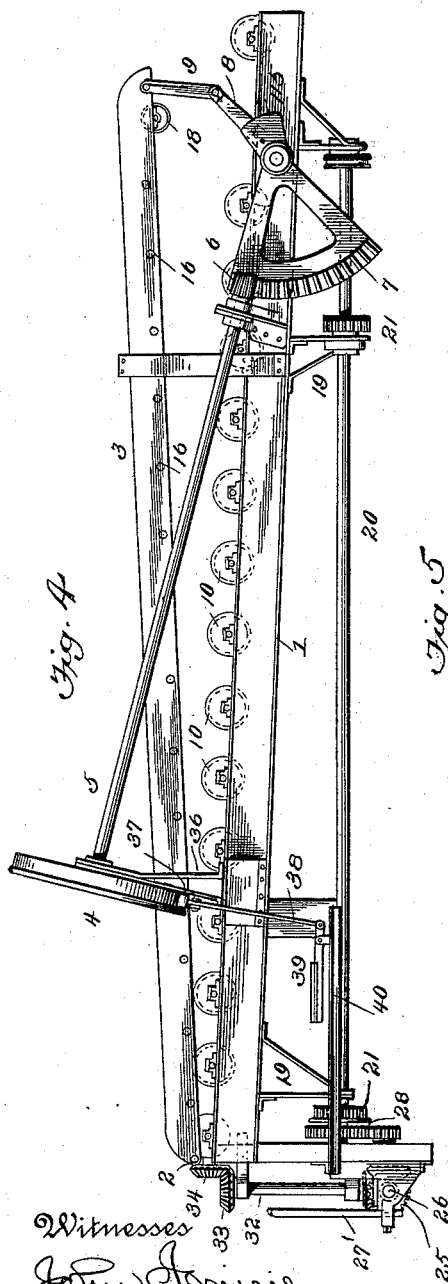
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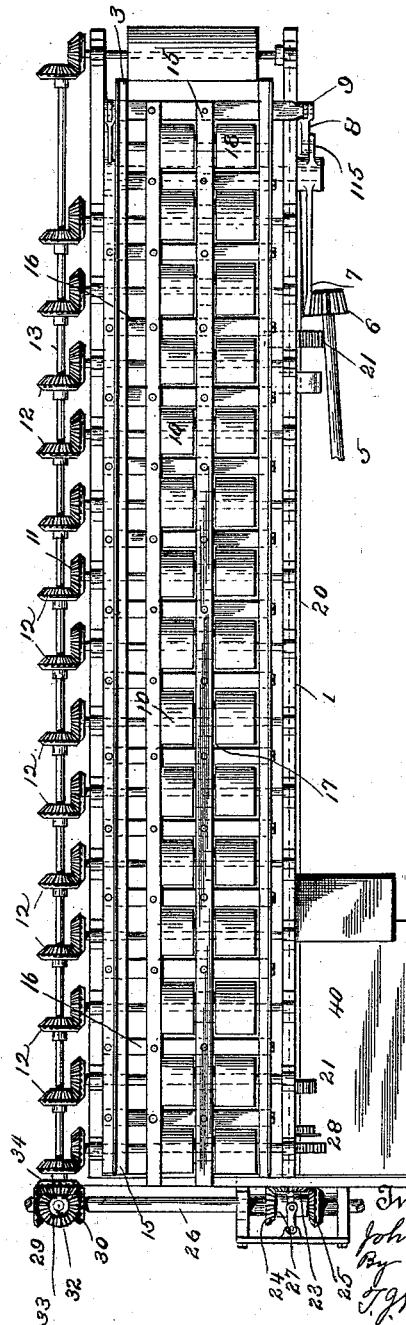
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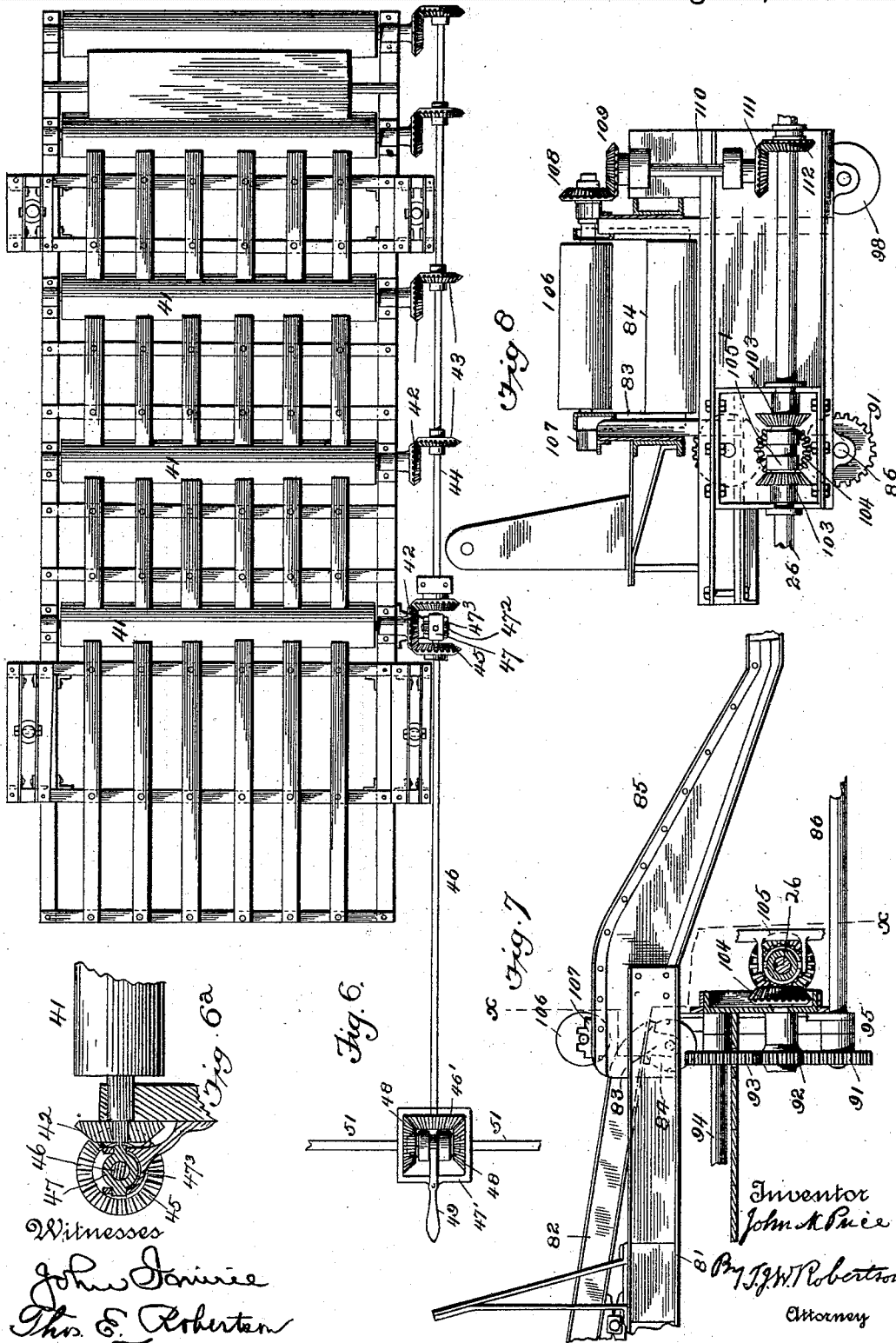
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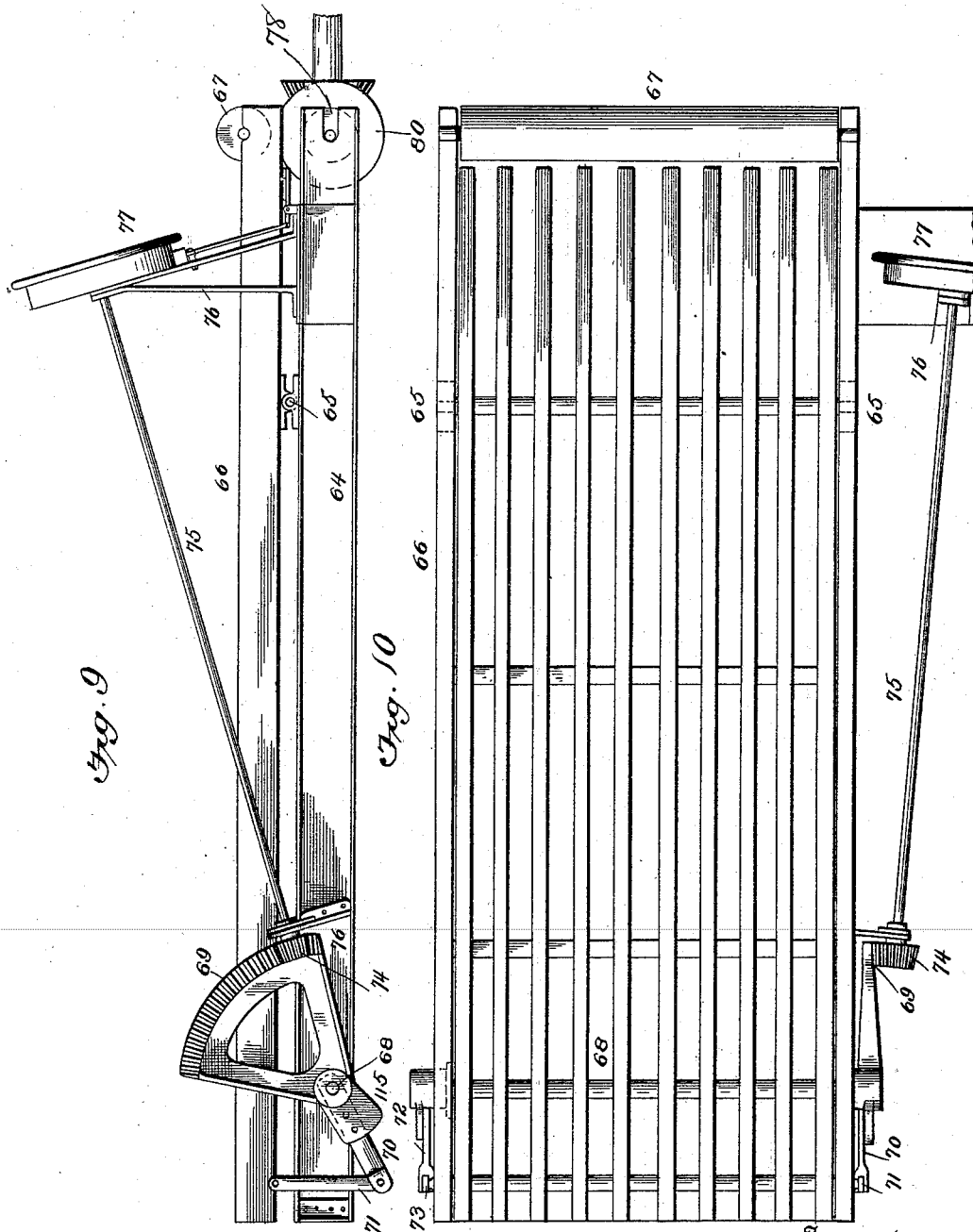
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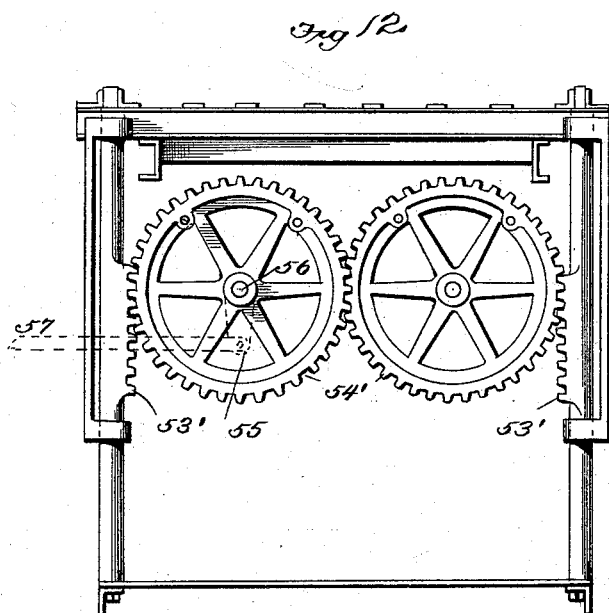
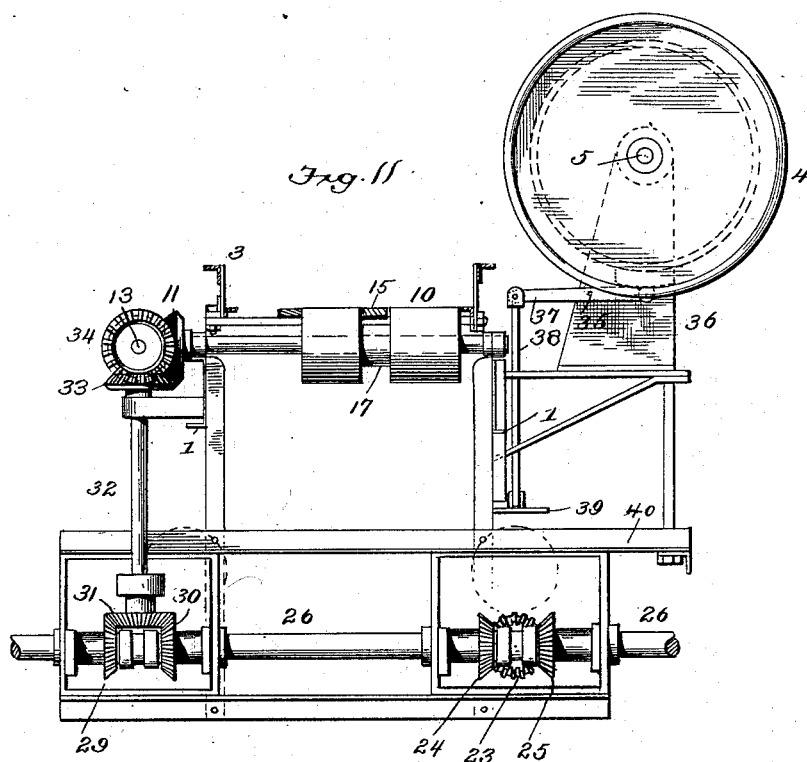
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UNITED STATES PATENT OFFICE.

JOHN M. PRICE, OF NEW YORK, N. Y.

ROLLING-MILL APPLIANCE.

SPECIFICATION forming part of Letters Patent No. 525,027, dated August 28, 1894.

Application filed July 21, 1893. Serial No. 481,156. (No model.)

To all whom it may concern:

Be it known that I, JOHN M. PRICE, a citizen of the United States of America, residing at Kings Bridge, New York city, New York, have invented certain new and useful Improvements in Rolling-Mill Appliances, of which the following is a specification, reference being had therein to the accompanying drawings.

This improvement is designed to provide feeding and carrying devices for rolling mills that will, while increasing the output, reduce the manual labor required to a minimum.

To these ends the invention consists in the peculiar construction, arrangement and combinations of parts hereinafter more particularly described and then definitely claimed.

In the accompanying drawings—Figure 1 is a plan of the apparatus constructed according to my improvement, showing four tables numbered for convenience, I, II, III and IV. Fig. 2 is an elevation of the tables III and IV. Fig. 3 is an elevation of the tables I and II. Fig. 4 is an elevation of table No. I looking toward tables I and IV. Fig. 5 is a plan of the same. Fig. 6 is a plan of table No. II. Fig. 6^a is a vertical transverse section of a detail which will be more fully hereinafter referred to. Fig. 7 is a detail showing parts of table No. IV on a larger scale. Fig. 8 is a section on the line *xx* of Fig. 7. Fig. 9 is an elevation of table No. III, taken from between tables II and III. Fig. 10 is a plan of the same. Fig. 11 is an end view of table No. I. Fig. 12 is an end view of table No. II.

Referring now to the details of the drawings by figures, 1 (see Figs. 4 and 5) is the main frame of table No. I on which is pivoted at 2 the rising and falling frame 3, and which is raised and lowered by means of a hand-wheel 4, on a shaft 5, which carries a pinion 6, meshing with a segmental rack 7, having an arm 8 at the other side of its bearing, which is connected with the frame 3 by a link 9. The main frame 1 carries a series of rollers 10, all connected by miter-gears 11 with a series of similar gears 12, fast on a shaft 13, connected through an intermediate shaft 26 and a belt with the shaft 14 of the rolls. The bottom of the upper frame 3 comprises four longitudinal bars 15 (see Fig. 5) connected together by cross-bars 16 and one of the four

drops down in groove 17 in the rollers 10 as shown in Fig. 11. At the inner end of the upper frame is a roller 18, carried on brackets on the face of the stand.

Beneath the main frame and journaled in hangers 19 therein is a shaft 20 having spur-wheels or pinions 21, which travel on racks 22 (see Fig. 1) and derive motion through the gearing 23, 24, 25, the first being connected by intermediate gears 28 with the shaft 20 and the last two being loosely mounted on the shaft 26. Between these gears 24 and 25 is a double cone friction-clutch 27, having a feather engaging in a groove in said shaft 26 so as to always turn therewith, which clutch is moved to engage with either of the gears 24 or 25 by means of a shifter 27', by which either of said gears 24 or 25 may be caused to turn with the shaft 26 and turn the wheel 23, and thus the shaft 20 can be turned by means of the intermediate gears 28 in either direction, and the table be moved backward or forward at will over the racks 22 and rails 99 hereinafter mentioned.

At the opposite corner of the table is shown another set of gearing (see Fig. 11) by which motion is given to the rollers 10. These gears are indicated at 29 and 30, and are loosely set on the shaft 26 and made to revolve with it in the same manner as the wheels 24 and 25. Either of these can thus be made to turn the gear 31, so as to turn the shaft 32, carrying the gear 33, which meshes with the gear 34, on the shaft 13 carrying the gears 12 before referred to. By shifting the clutch between these gears 29 and 30, the shafts 32 and 13 can be turned in either direction, and the rollers 10 also.

Pivoted at 35 to the standard 36 carrying the shaft 5, is a brake-lever 37, connected by the rod 38 to a treadle-lever 39, by which the brake may be brought into action by the operator as he stands on the platform 40 in working the hand-wheel 4.

The table No. II (see Fig. 6) has a series of rollers 41 which rollers are provided with bevel-gears 42, meshing with other bevel-gears 43 on a horizontal shaft 44. The gear on the outer roller meshes with a gear 45 (see Fig. 6^a) on a shaft 46, the upper end of which is mounted in a box 47, pivoted at 47² to a forked standard 47³ attached to the table so

as to allow one end of the shaft 46 to rise and fall with said table. The lower end of this shaft is also mounted in a box 47' pivoted on the shaft 51 so as to allow the upper end to rise and fall, and is provided with a bevel-gear 46' meshing with two bevel gears 48, either of which can be brought into operative connection with the shaft 51 by moving the double cone friction-clutch in either direction by the shifter 49.

Depending from the table No. II are racks 53' (see Fig. 12) into which gear the spur-wheels 54', by means of which the table is raised at will. These may be operated in any suitable way; as an example I show a crank 55 on the shaft 56, which may be driven by a connecting rod 57 worked by (see Fig. 1) a wrist-pin 58, on a gear-wheel 59, deriving motion from a smaller gear-wheel 60 which is driven through the medium of a clutch (indicated at 61) and intermediate gears 62 and 63 by the shaft 51. The weight of the table when the clutch is released will carry it back to its lowest position and the clutch acting as a brake controls the descent of the table.

Referring now to Figs. 9 and 10, (which show an elevation and plan of table No. III) 64 is the base of the table, to which is pivoted at 65 the upper frame 66, carrying a dead-roller 67. The lower frame or base carries a shaft 68, on which is rigidly secured the rack segment 69, having an arm 70, which is connected by a link 71 with the upper frame 66. The shaft 68 carries another arm 72, which is also connected with the upper frame by a link indicated at 73. Meshing with the rack segment 69 is a pinion 74, on a shaft 75, mounted in suitable brackets 76, and provided with a hand-wheel 77, by turning which the table can be tipped as indicated in Fig. 2. At the outer end of the base 64 is a continuously running roller 78 which receives motion from the shaft 51 (Fig. 1) through the medium of the bevel-gears 79 and 80.

Table No. IV has a lower frame or base 81 (see Figs. 2 and 7) carrying a pivoted upper frame 82 which is tipped in precisely the same manner as the table No. III, by means of a segment, rack, hand-wheel, &c., as will be seen on referring to the central part of Fig. 2. At the outer end of the upper frame are depending brackets 83 (shown in dotted lines in Fig. 7) which carry a roller 84 shown partly in dotted lines.

Attached to the base 81 is a trough 85, mounted on and carried by a shaft 86, having a gear-wheel 87 (see Fig. 2) meshing in a rack 88, and supporting wheels 89 running on suitable tracks 90. The inner end of the shaft 86 carries a spur-wheel 91, meshing with a spur-wheel 92, which gives motion to spur-wheel 93 and shaft 94, mounted in brackets 95 on the under side of the base, and carrying spur-wheels 96, engaging with racks 21, and supporting wheels 98 running on tracks 99.

Motion is given to wheel 92 by means of the shaft 26, which receives motion from the shaft

14 (see Fig. 1) through the medium of the belt 101 and pulley 102. To give motion to the wheel 92, shaft 26 has (see Fig. 8) bevel-gears 103, either of which can be made to turn the bevel-gear 104, which is fast on the shaft of wheel 92, by means of the shifter 105 moving the double friction-clutch 105'. Shaft 26 also gives motion to the roller 106, mounted in bearings 107 in the upper part of the trough 85, said roller carrying a bevel-gear 108 which meshes with another bevel-gear 109, on a shaft 110 carrying another bevel-gear 111, engaging with a fourth bevel-gear 112 on shaft 26.

Mounted in suitable bearings 113 (see Fig. 3) is a live-roller 114, which may receive motion in any suitable manner, and which is designed to assist in feeding out the piece from the first top pass onto the frame of table No. I when said frame is elevated.

The operation is as follows: The piece to be rolled is first set on table No. I and is fed into the bottom pass by the continuously-acting rollers 10, and after passing through the rolls it is received upon the table No. II, which is then in its lowest position, but is immediately raised by the gearing shown in Fig. 12, to the position shown in Fig. 3, and the rollers 41 being set in motion, feed the piece into the upper pass, and the upper frame of table No. I being raised, as shown in Fig. 3, receives the piece and lowers it upon the continuously revolving rollers 10, and the table having been moved laterally while the frame is being lowered, the piece is fed into the second lower pass of the first set of rolls and returned to the upper pass as before, and so on until the passage through the different passes of the first set of rolls has been accomplished. Table No. IV having been moved out of the way, table No. I with the piece on it is now moved opposite the second set of rolls, and the rollers feed the piece to the first bottom pass and it is received by table No. III which is then raised to the position indicated in Fig. 2, and as the frame is raised, the roller 67 is lowered until it approaches close to roller 78, whereby motion is given to said roller 67 by its contact with the roller 78 and the piece, resting on said roller 67, receives motion therefrom and is fed into the upper pass from whence it passes onto the frame 82 of the upper frame of table No. IV, said table having been brought back to the position shown in Fig. 1 and its frame 82 raised as indicated in Fig. 2 ready to receive the piece. The frame 82 is now lowered and it and its table moved slightly so as to bring the rail opposite the next lower pass. As the table is lowered, the short end which carries the roller 84 rises, so as to bring the rollers 84 and 106 close enough together to grasp and feed the piece back into the rolls and these movements are continued until the piece has been fed through all the passes, when the table No. IV is moved in line with the planishing rolls 116, and the piece fed through them. The trough 85 attached to the table No. IV simply serves as an extension of

the said table to receive the now lengthened rail. It is made low for a portion of its length to allow of its passing under a bridge used in the works where the apparatus from which the drawings were made is to be employed.

For ease and convenience in operation, it will be advisable to provide the tables with counterbalance weights which are indicated at 115 as attached to the segments.

10 What I claim as new is—

1. In a rolling mill apparatus, the combination with a table, and a roller mounted thereon operatively connected with the motive power, of a frame pivoted to said table near its outer end, a roller mounted thereon, and means for raising and lowering said frame, thus causing one of said rollers to approach the other, substantially as described.

2. In a rolling mill apparatus, the combination with a table, a roller mounted thereon, and means for rotating said roller in either direction, of a frame pivoted to said table, a roller mounted thereon, and means for raising and lowering said frame, thus causing one of said rollers to approach the other, substantially as described.

3. In a rolling mill apparatus, the combination with a table and a set of rollers mounted thereon, of a frame pivoted to said table, a rack segment mounted on the table and connected to the frame, a pinion meshing with said rack, and a hand-wheel and shaft for operating said pinion, substantially as described.

4. In a rolling mill apparatus, the combination with a table and a set of rollers mounted thereon, a frame pivoted to said table, a hand-wheel and intermediate mechanism for operating said frame, and a brake mechanism for bearing on the hand-wheel, substantially as described.

5. In a rolling mill apparatus, the combination with a table and a series of grooved rollers mounted thereon, of a frame also mounted on the table and having a central longitudinal bar setting in the groove in said rollers, and means for raising and lowering said frame, substantially as described.

6. In a rolling mill apparatus, the combination with a table and a series of rollers mounted thereon, of a frame pivoted on said table, a roller mounted on and mechanism for raising and lowering said frame, thus causing the roller on the frame to co-act with those on the table, a track supporting said table,

and means for giving the table a lateral motion, substantially as described.

7. The combination in a rolling mill apparatus, of a table, a set of rollers mounted thereon, a rotary shaft and intermediate gears for giving motion to said rollers, mechanism for vertically raising and lowering said table, and a rotary shaft carrying a gear meshing with a gear on one of the rollers, and mounted in boxes swinging on centers in line with the axis of said roller, substantially as described.

8. The combination in a rolling mill apparatus, of a table, a frame pivoted thereto, a roller on the frame and a roller on the table, one of which is connected with the motive power and means for causing one of said rollers to approach and co-act with the other in feeding the piece to be rolled, substantially as described.

9. In a rolling mill apparatus, the combination with a table 81, of a roller 106 supported above said table, a frame 82 pivoted on said table carrying a roller 84, arranged below said roller 106, and means for giving motion to one of said rollers and for causing one of the same to approach the other, substantially as described.

10. In a rolling mill apparatus, the combination with a table, of a roller supported on said table, a frame pivoted on said table carrying a roller above the first mentioned roller, and means for giving motion to the lower roller and for causing the upper roller to approach the other, substantially as described.

11. In a rolling mill apparatus, the combination of a table 81, a roller 106 mounted above the same, a frame 82 pivoted on the table, brackets 83 carried by the frame, a roller 84 set in said brackets, and means for giving roller 106 rotary motion, substantially as described.

12. In a rolling mill apparatus, a table having a continuously revolving roller 78, a frame pivoted to the table near one end thereof and carrying a dead roller 67, in combination with a hand-wheel 77, and intermediate connection for raising and lowering the table, substantially as described.

In testimony whereof I affix my signature, in presence of two witnesses, this 7th day of July, 1893.

JOHN M. PRICE.

Witnesses:

M. W. JACOBS,
R. S. CARE.