No. 837,039. PATENTED NOV. 27, 1906.

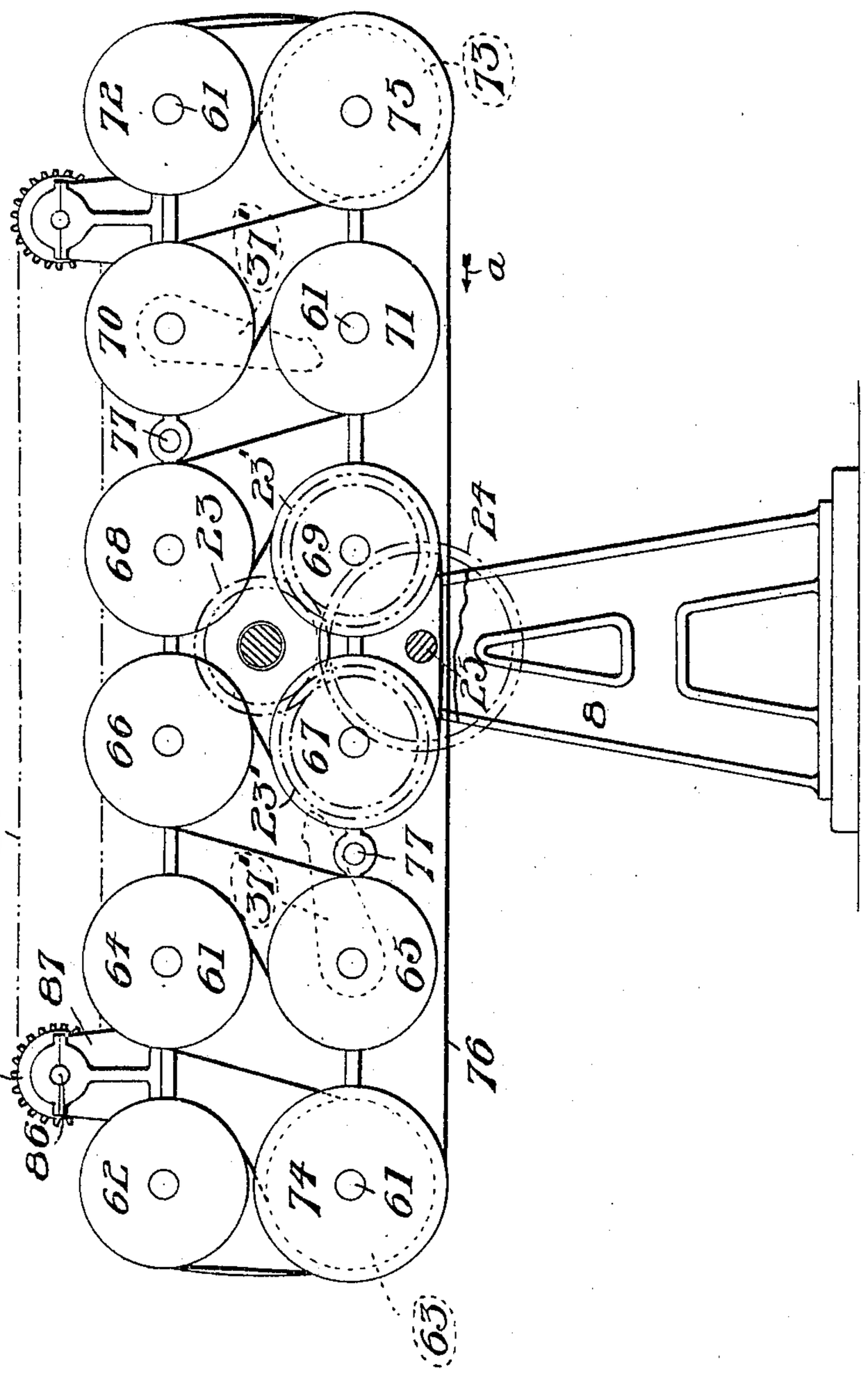
V. CHARTENER.

WORK REVERSING MECHANISM FOR ROLLING MILLS.

APPLICATION FILED APR. 8, 1905.

4 SHEETS—SHEET 1.

Fig. 1.



WITNESSES:

J. B. Hoffman,

M. A. Buchman

INVENTOR

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4 SHEETS—SHEET 2.

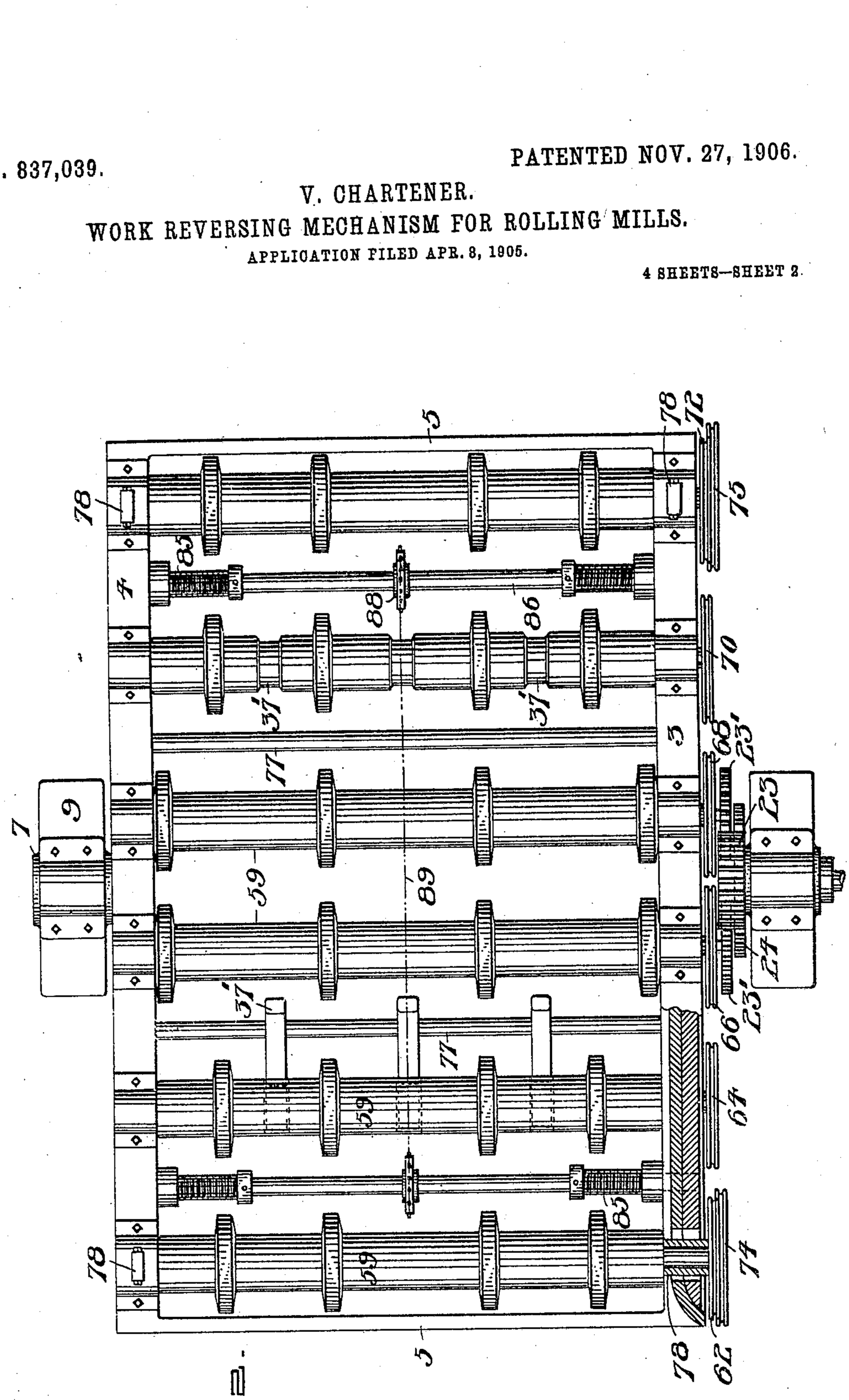

FIG. 2.

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4 SHEETS—SHEET 3.

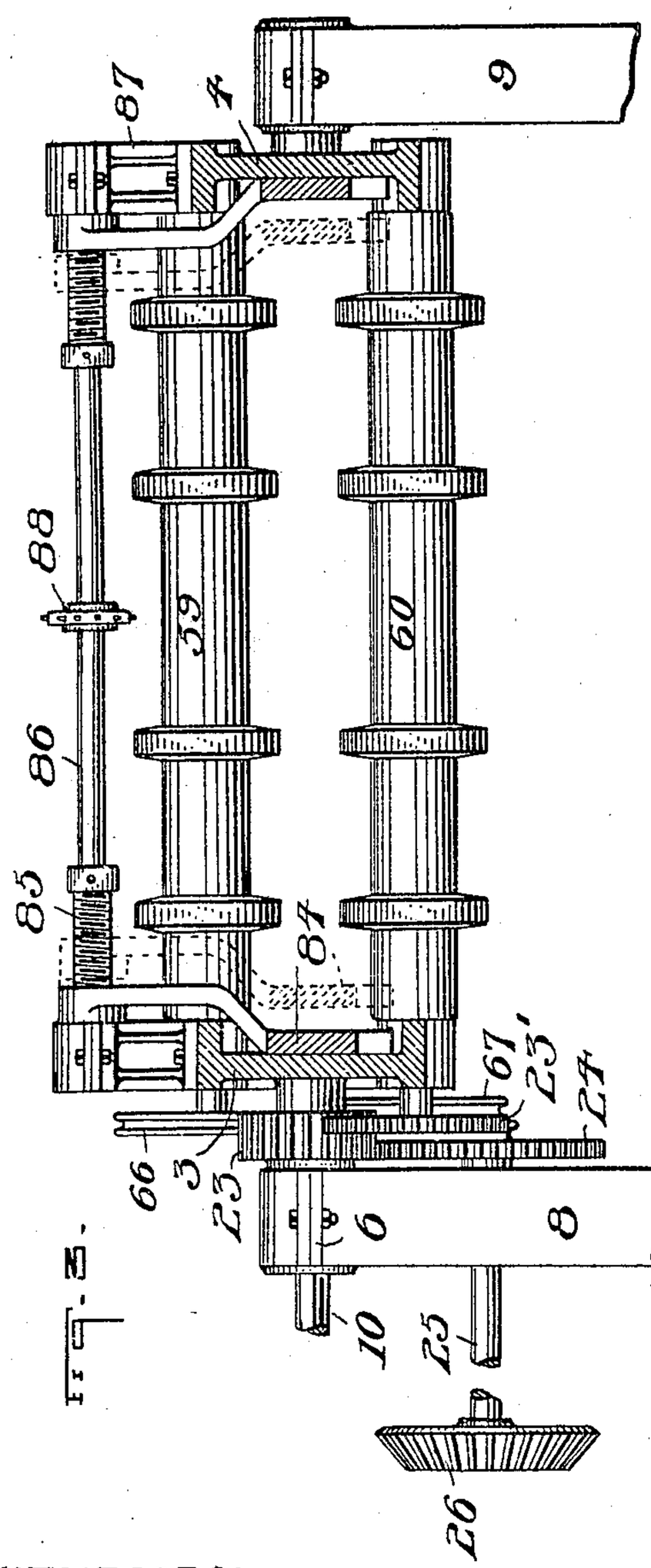

FIG. 3.

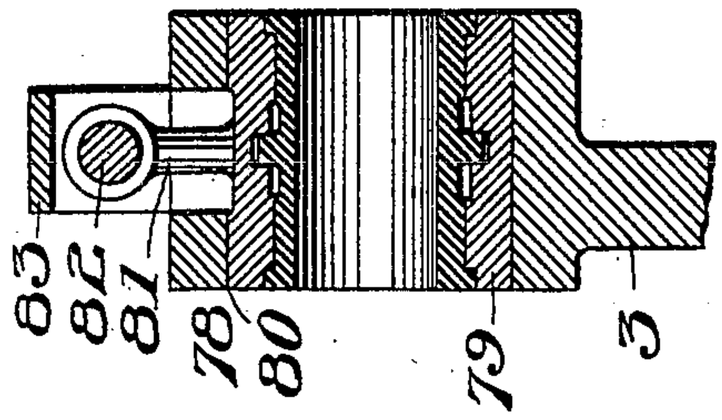

FIG. 6.

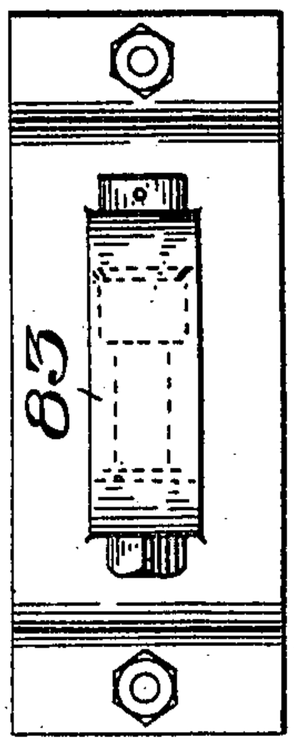

FIG. 5.

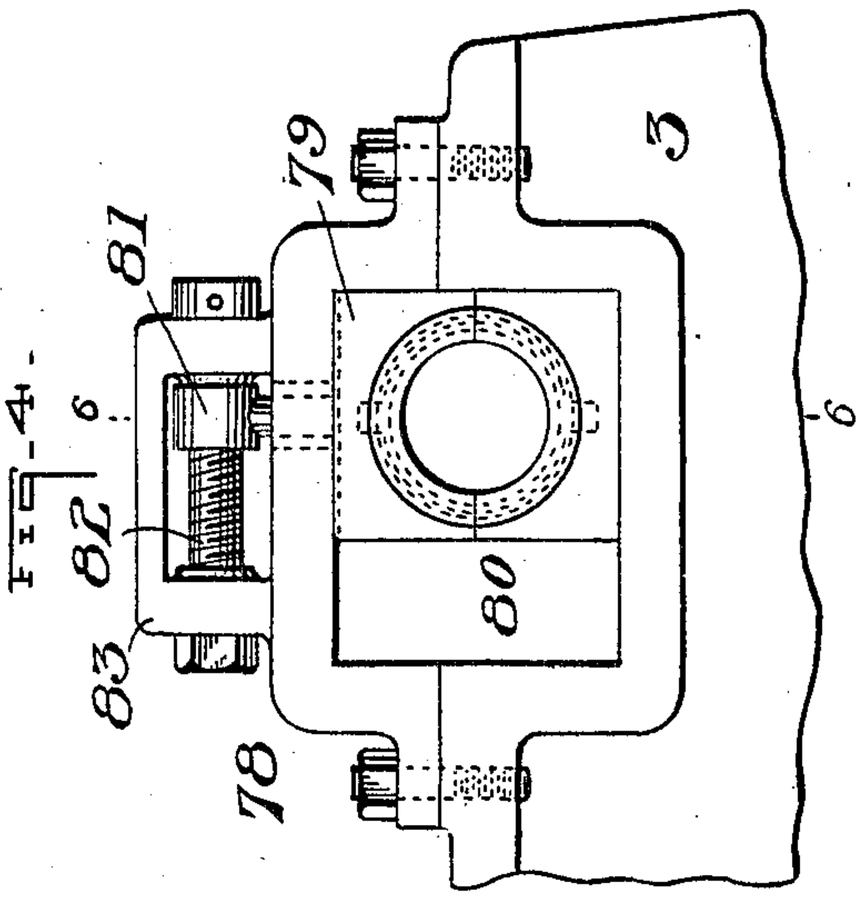

FIG. 4.

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4 SHEETS—SHEET 4.

FIG. 8.

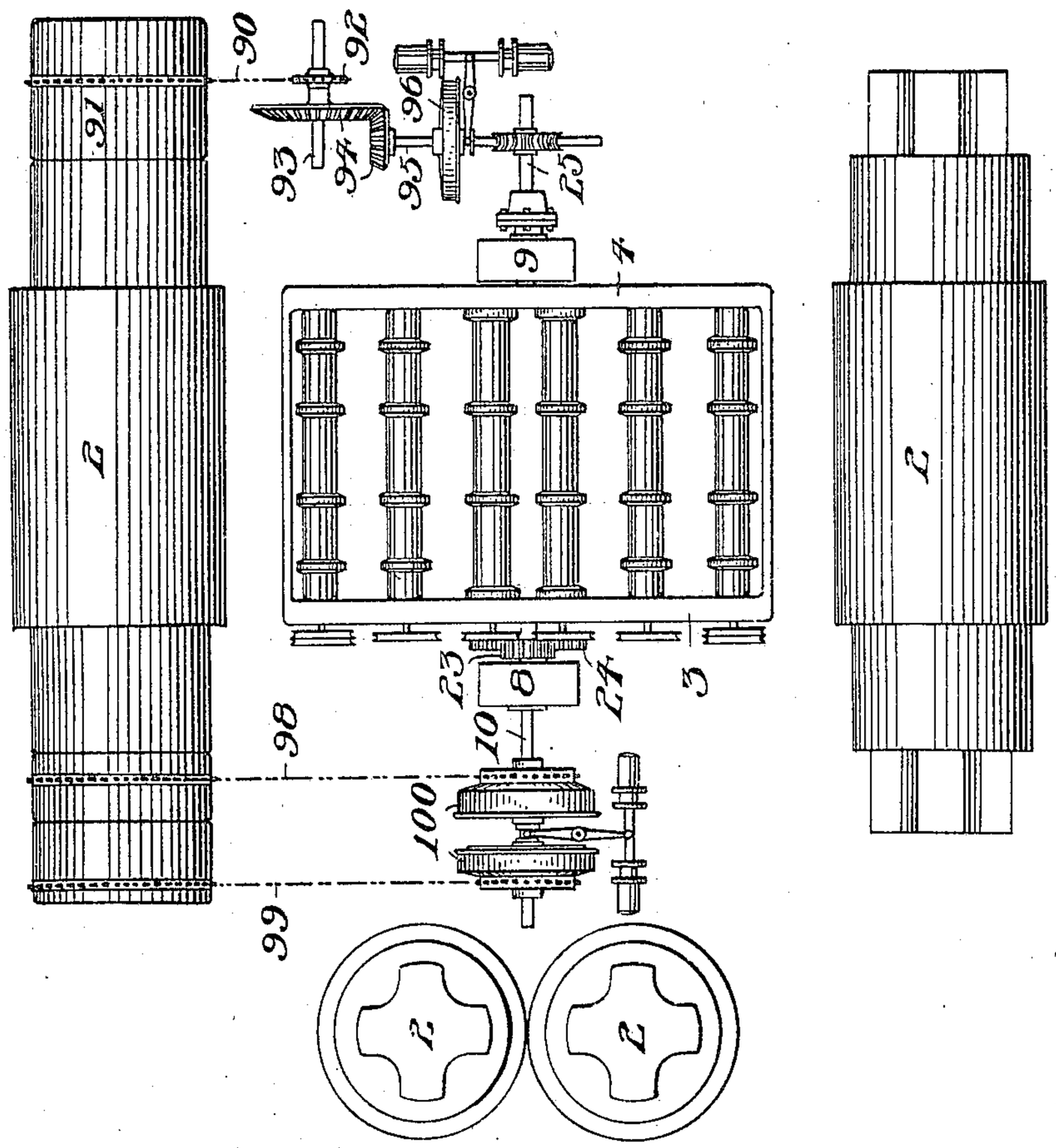
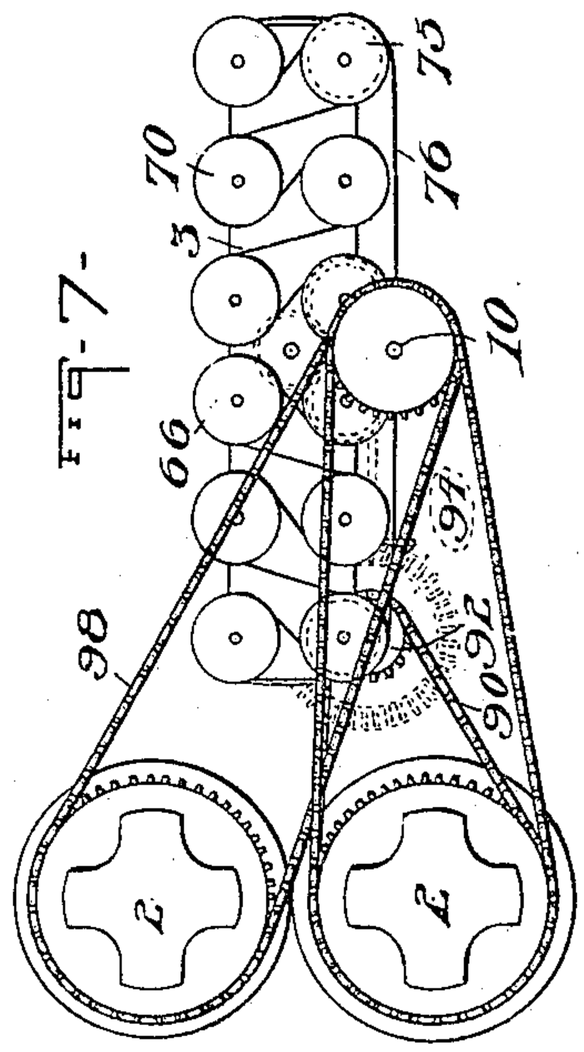


FIG. 7.



WITNESSES:

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UNITED STATES PATENT OFFICE.

VICTOR CHARTENER, OF PITTSBURG, PENNSYLVANIA.

WORK-REVERSING MECHANISM FOR ROLLING-MILLS.

No. 837,039. Specification of Letters Patent. Patented Nov. 27, 1906.

Application filed April 8, 1905. Serial No. 254,571.

To all whom it may concern:

Be it known that I, VICTOR CHARTENER, a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented or discovered new and useful Improvements in Work-Reversing Mechanism for Rolling-Mills, of which the following is a specification.

My invention relates to rolling-mills, and more particularly to mechanism for reversing the work between successive stands of rolls.

It is the object to provide a straight-away feeding mechanism for use with universal or other types of rolling-mills, wherein the work is fed in the same direction through the rolls, which always run in the same direction and which need thereby be but two high, the work being reversed before entering the passes of the successive rolls or of such rolls as it is deemed desirable to reverse the work.

It has recently been discovered that when metal is rolled by passing the same end foremost through the rolls the molecules of the iron are strained or displaced in such a manner as not to produce as desirable and as uniform quality of plates as when the metal is fed during a portion of the rolling process with one end foremost and during another portion thereof with the opposite end foremost. Accordingly I have devised a table to which the metal is fed by one set of rolls and by which it is turned end for end and fed into the next set of rolls. I have illustrated means for reversing the feeding means carried by the table and for reversing the table; but the specific means shown for doing these things, as well as the construction of the table itself, may be departed from without sacrificing my invention.

Referring to the drawings which accompany this specification, Figure 1 is an end elevation of my table provided with a rope or cable drive; Fig. 2, a plan view of the same; Fig. 3, an end elevation thereof; Fig. 4, a fragmentary view showing in side elevation one of the devices by which we tighten the rope, cable, or equivalent; Fig. 5, a top view thereof; Fig. 6, a vertical section thereof transverse of the table on the line 6 6 of Fig. 4; Fig. 7, an end view showing a modified means of reversing the table and driving the rollers thereof, and Fig. 8 a plan view of the same.

Referring now to Figs. 1 to 6, my reversing table has the two side plates 3 and 4 and the cross-connectors 5 and is mounted centrally on the trunnions 6 and 7, which are rotatable on the standards or housings 8 and 9. The trunnion 6 is driven by the shaft 10, whereby the table is rotated, and has loose thereon the long pinion 23, meshing with the spur-gears 24 and secured to the shaft 25, supported in the housing 8.

Journaled transversely in the side plates 3 and 4 are a number of pairs of feed-rollers, arranged in two horizontal rows, with a work-feed pass between the rows. One row of feed-rollers bears the numeral 59 and the other row the numeral 60; but the number in each row may be greater or less than eight. On the necks 61 of the rollers on one side of the feed-pass are the sheaves 62, 64, 66, 68, 70, and 72, and on the necks of the rollers on the other side of the feed-pass are the sheaves 63, 65, 67, 69, 71, 73, 74, and 75. Two rollers, which lie one on each side of the transverse center line of the table, have their necks also provided with gear-wheels 23′, meshing with the loose pinion 23. On the necks of each of the two end rollers—for example, those which carry the sheaves 63 and and 73—are the loose sheaves 74 and 75.

Running over the several sheaves is an endless rope or cable or other flexible driving device 76 for the rollers, the same being arranged in any desired manner which will drive all the rollers simultaneously in either direction. The cable runs in the direction indicated by the arrow *a* and passes from the bottom of the sheaves 74 upwardly on its outer edge and over the sheave 62, between the sheaves 62 and 63 and around the latter, then over the sheave 64, between the sheaves 64 and 65 and around the latter, over the sheave 66, between the latter and the sheave 67 and around the latter and the sheave 69, between the latter and the sheave 68 and around the latter, around the sheave 71, between the latter and the sheave 70 and around the latter, around the sheave 73′, between the latter and the sheave 72 and around the latter, and around the sheave 75 back to sheave 74. The shaft 25, through the wheels 23, 23′, and 24, drives the sheaves 67 and 69, which are fixed to same roller-necks as the wheels 23′. The cable 76 is driven by the sheaves 67 and 69 and drives all the rollers except the two which are driven by the wheels 23′.

One shaft of a roller in each row of rollers

carries the stops 37′, which are shown as independent of each other. These stops are hung on narrow necks on the roller-shafts toward the ends of the table. Several of these stops are hung on a line of one shaft above the pass at one end of the table and another row is hung on another shaft above the pass at the other end of the table. The stops below the pass will swing down with their free ends resting on the cross-rod 77, as shown on Fig. 2, where they will be out of the path of the work. The stops hung above the pass will be suspended, so as to intercept the work as it moves along the pass. When the table is reversed, the suspended stops rest on the adjacent cross-rod 77, and the previously horizontal stops become suspended in the path of the work.

In order to tighten the cable 76, I have shown the tightener 78 for adjusting the end rollers, which are mounted in the journal-boxes 79, adjustable horizontally in the slideways 80 in the table. Each journal-box 79 has a lug or stem 81 on the screw 82, journaled in the frame 83 on the journal-box housing. By turning the screws 82 the cable can obviously be tightened until the journal-boxes reach the outer end of the slideways.

At each side of the table is a gage-bar 84, hung on the screw-threaded portions 85 of the shafts 86, mounted in the housings 87 on one side of the table. The threads at one end of the screws are right-handed and at the other left-handed. The shafts 86 have, preferably, sprocket-wheels 88, connected by the sprocket-chain 89, so that both shafts 86 will be simultaneously driven in the same direction to cause the gage-bars at opposite sides of the table to approach each other at the same time. The work is thus centered in the table and fed into the center of the next roll-pass.

Referring now to Figs. 7 and 8, I have shown the table and rolls diagrammatically. The table is rotated by the shaft 25, driven from the coupling of one of the rolls 2, as by the sprocket-chain 90, which runs over the coupling 91, and the sprocket-wheel 92 on the shaft 93. The latter shaft drives the bevel-gearing 94, which in turn drives the shaft 95, containing the clutch 96. The worm-gearing 97 connects the shafts 25′ and 95.

The shaft 10, which drives the rollers of the table in any desired way, is driven in one direction by the sprocket-chain 98, connected to the upper roll 2, and in the opposite direction by the sprocket-chain 99, connected to the lower roll 2, the double clutch 99 connecting the shaft 10 to either sprocket-chain.

I do not restrict my reversing table to the construction shown and described, or to its being an element of the combination with which it has been shown and described, as it may be variously constructed and used without departing from the principles thereof.

I desire my claims to be given the largest scope that the state of the art will permit irrespective of the mechanical elements and combination I have used.

Having described my invention, I claim—

1. In a continuous rolling-mill, a pair of rolls, a reversible roller-feed table coöperative therewith, and a belt transmission device between the roller-feed mechanism and each roll, arranged to drive the roller-feed mechanism in opposite directions, and means for operatively connecting either roll to said roller-feed mechanism.

2. In a continuous rolling-mill a pair of rolls, a roller-feed table coöperative therewith, and belt transmission device between the roller-feed mechanism and each roll, means for operatively connecting either roll to said roller-feed mechanism for reversing the same, and means for rotating said table.

3. In a continuous rolling-mill, a pair of rolls, a roller-feed table coöperative therewith, and belt transmission device between the roller-feed mechanism and each roll, means for operatively connecting either roll to said roller-feed mechanism for reversing the same, and means connected to one of said rolls for rotating said table.

Signed at Pittsburg, Pennsylvania, this 10th day of March, 1905.

VICTOR CHARTENER.

Witnesses:
F. N. Barber,
Elva Stanich.