

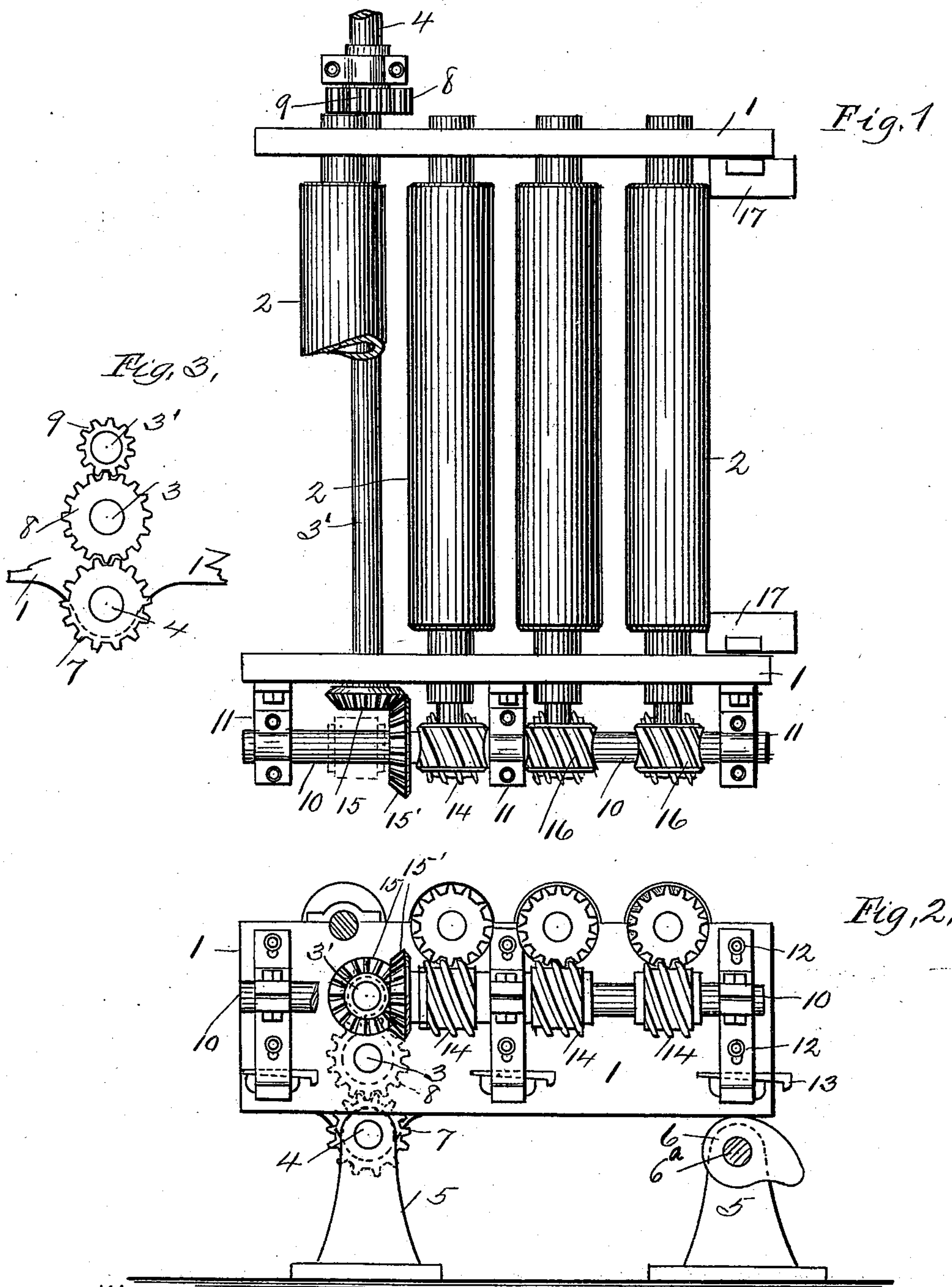
(No Model.)

S. E. FORBES.

MEANS FOR OPERATING ROLLING MILL REVERSING TABLES.

No. 549,634.

Patented Nov. 12, 1895.



Witnesses:  
Richard B. Harrison,  
Otto A. Hensel.

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# UNITED STATES PATENT OFFICE.

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TO HENRY H. ANDERSON AND THOMAS HIGGENS, OF SAME PLACE.

## MEANS FOR OPERATING ROLLING-MILL REVERSING-TABLES.

SPECIFICATION forming part of Letters Patent No. 549,634, dated November 12, 1895.

Application filed May 28, 1895. Serial No. 551,030. (No model.)

*To all whom it may concern:*

Be it known that I, SAMUEL E. FORBES, a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Means for Operating Rolling-Mill Reversing-Tables; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to an improved means for operating rolling-mill lifting-tables; and it consists in providing a means whereby the knocking or jarring caused by the sudden reversing of the rollers forming the table will be obviated, together with the certain details of construction and combination of parts, as will be fully set forth hereinafter.

In the use of "three-high" rolls in the manufacture of heavy iron, steel, &c., it is necessary to provide a means or table for receiving the metal from the lower pass and elevate one end to a level of the upper pass. These tables consist in common practice of a series of parallel rollers arranged in a frame, and means for rotating and reversing the rotary movement of the same. This has been accomplished heretofore by means of a line of gear-wheels and idlers connecting the one roller with the other, and it has been found by the use of these gear-wheels that the teeth are broken, stripped, and otherwise damaged when the movement of the rollers is abruptly reversed, which is of frequent occurrence while the mill is in use. To obviate this jarring and damaging effect on the table is the object of my invention.

In the accompanying drawings, Figure 1 is a plan view of an ordinary rolling-mill table provided with my improved means for operating the rollers, which is constructed and arranged in accordance with my invention. Fig. 2 is a side elevation of the same partly in section. Fig. 3 is a rear elevation showing the chain of gearing connecting the power with the shaft for driving the rollers.

To put my invention into practice, I provide a frame 1 of a suitable size and form of construction and provide the same with a series of rollers 2, arranged in bearings side by side and adapted to receive the piece of metal from the rolls. This table 1 is pivoted at the rear by means of a shaft 4 and suitable standards 5 in a manner that the front end of the table may be elevated by the cam-lever 6, arranged on a shaft 6<sup>a</sup>, whereby power is applied. This drive-shaft 4 is provided at one end with a gear-wheel 7, which is in mesh with a gear-wheel 8, and it in turn has connection with a gear-wheel 9, which is of small diameter to obtain an increased speed. This pinion 9 is mounted on one end of a shaft 3', which extends transversely across the table and is fitted with a bevel-pinion 15, which is in mesh with another 15', mounted on a shaft 10, arranged in the direction of the length of the table 1. This shaft 10 is mounted in adjustable bearings 11, which may be moved vertically a short distance to take up the wear of a number of worms 14, attached to the said shaft 10, and this adjustment is also necessary when removing or replacing the worms and worm-wheels upon the shaft 10. These bearings are adjusted by bolts 12 passing through slotted openings and held at the desired position by gibs and keys at the base. This shaft 10 is fitted with a series of worms 14 of very steep pitch, preferably having five distinct threads, which will give a quick rotary movement to the worm-wheels 16, in which they mesh and the said worm-wheels attached to the spindles of the rollers 2 will give the same the required speed, and also the worms, besides giving an increased speed by means of compounded threads, give a greater number of teeth in mesh at one time. Thus no matter when reversed they are always in readiness, without any abrupt jolting or jarring, to come into position. Suitable guides 17 are arranged at the receiving end of the table to keep the same in line.

By thus operating the rollers 2 all jar or knocking of the parts is obviated, as the worms and worm-wheels will give a steady movement in either direction to the rollers, thereby reducing the cost of operating such tables, and as the shaft 10, carrying the worms, may be ad-

justed vertically the wear on the parts may be taken up, thus further insuring the proper working of the apparatus at all times.

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

In combination with a rolling mill table, a shaft on which the table is pivoted, a cam lever arranged on a shaft at the opposite end  
10 of the table and engaging at the under side thereof a series of shafts 3, 3', and 4 carrying gear wheels on one end meshing with each other, a bevel gear 15 carried on the opposite end of the shaft 3', a horizontal shaft carry-

ing a bevel gear 15' meshing with the bevel 15 gear 15, adjustable bearings secured to the side of the table to receive the shaft 10, worms 14 on the shaft, and worm wheels 16 on the shaft of the rollers 2 meshing with the worms of the shaft 10, as and for the purpose de- 20 scribed.

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

SAMUEL E. FORBES.

Witnesses:

HENRY H. ANDERSON,  
JOHN C. THOMPSON.