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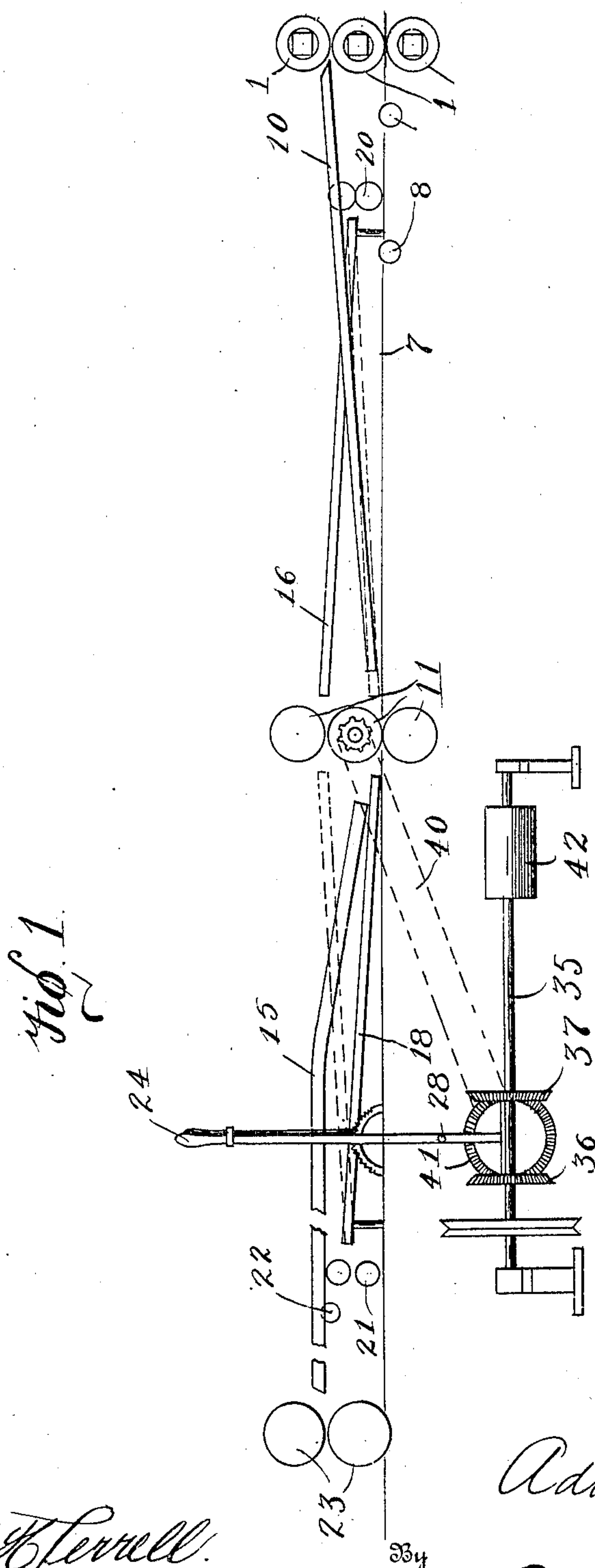
PATENTED FEB. 5, 1907.

A. J. HOAK.

MECHANISM FOR HANDLING METAL IN ROLLING MILLS.

APPLICATION FILED SEPT. 12, 1905.

4 SHEETS—SHEET 1.



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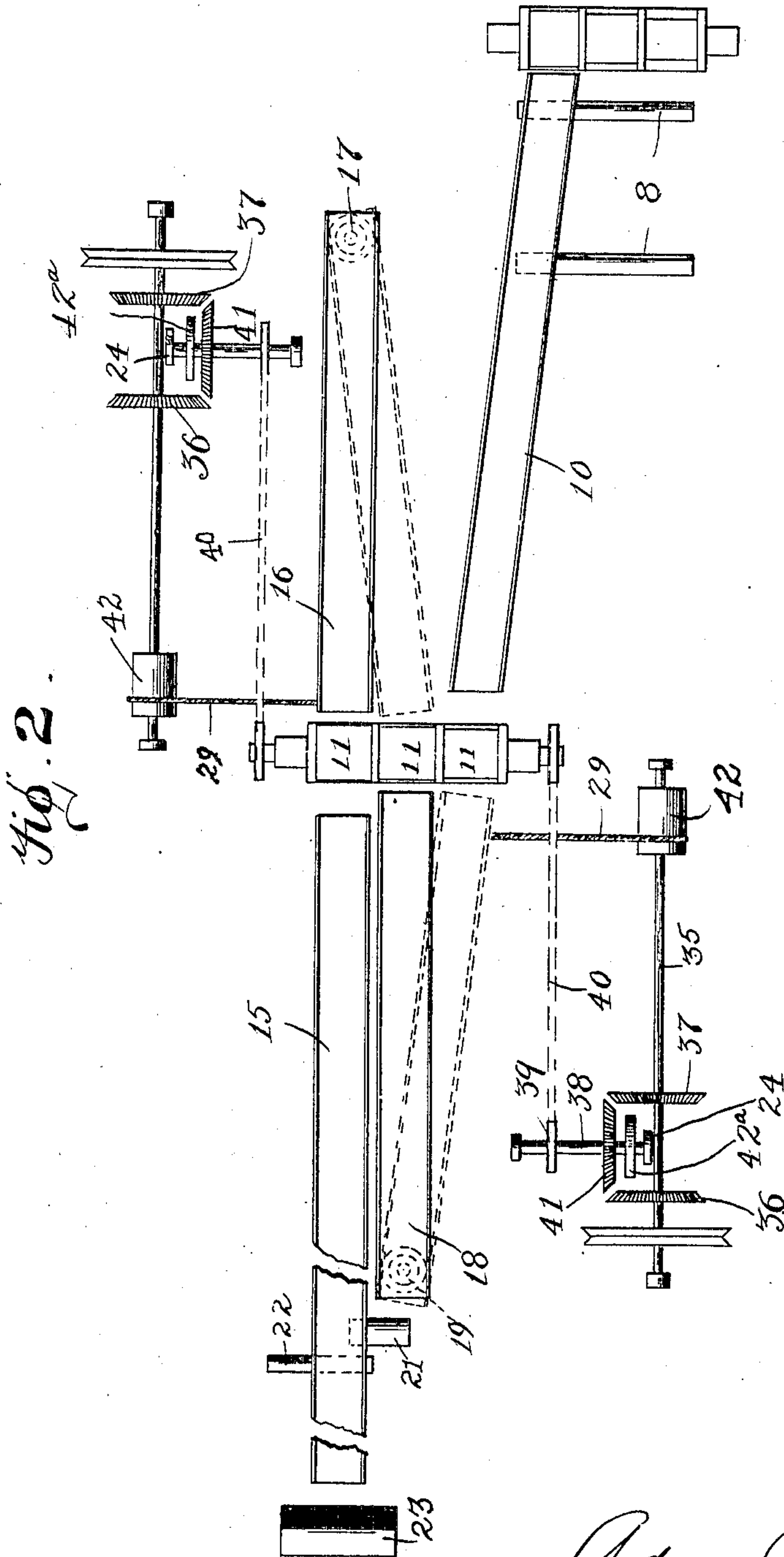
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4 SHEETS—SHEET 2.



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4 SHEETS—SHEET 3

Fig. 4.

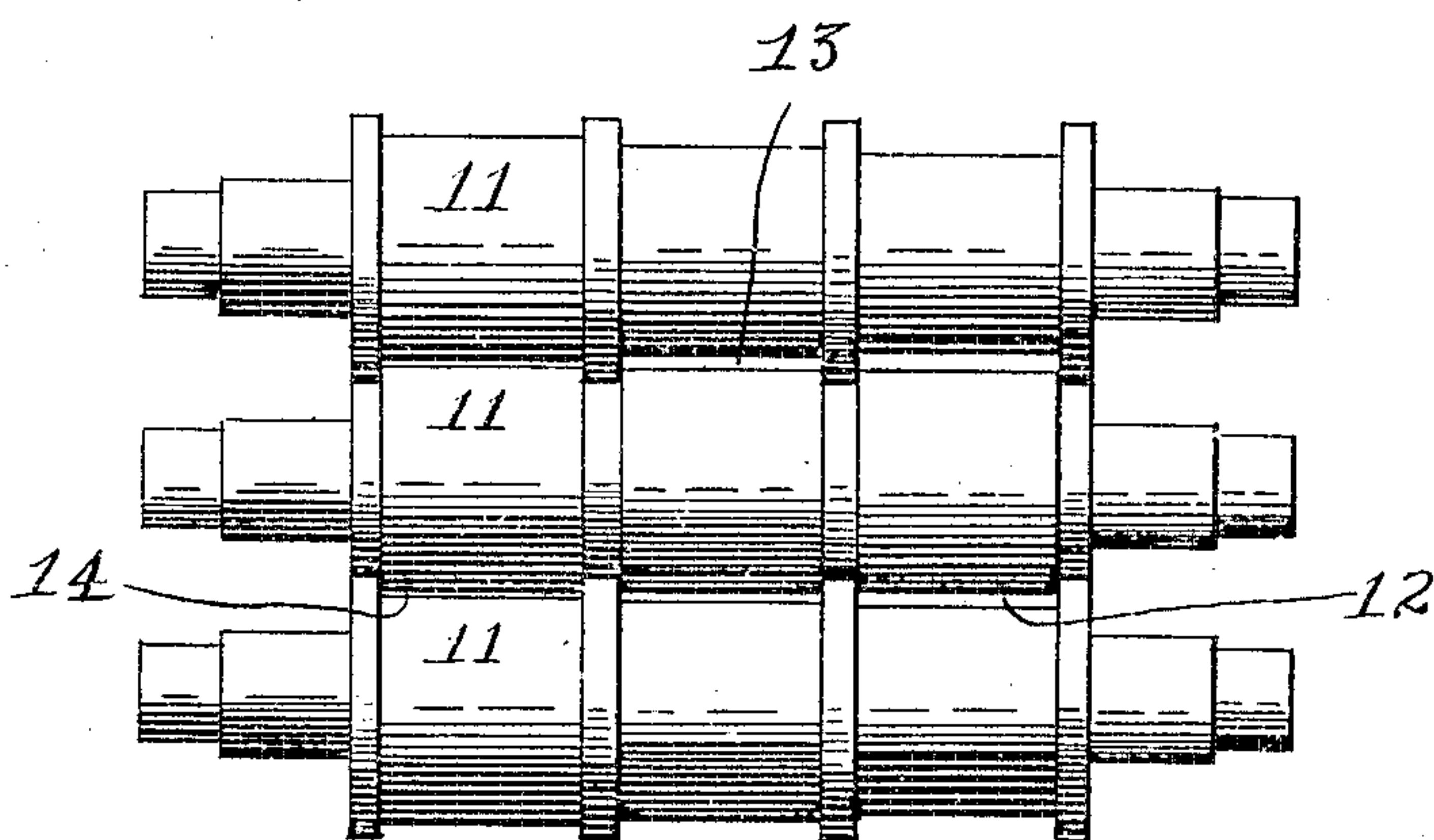
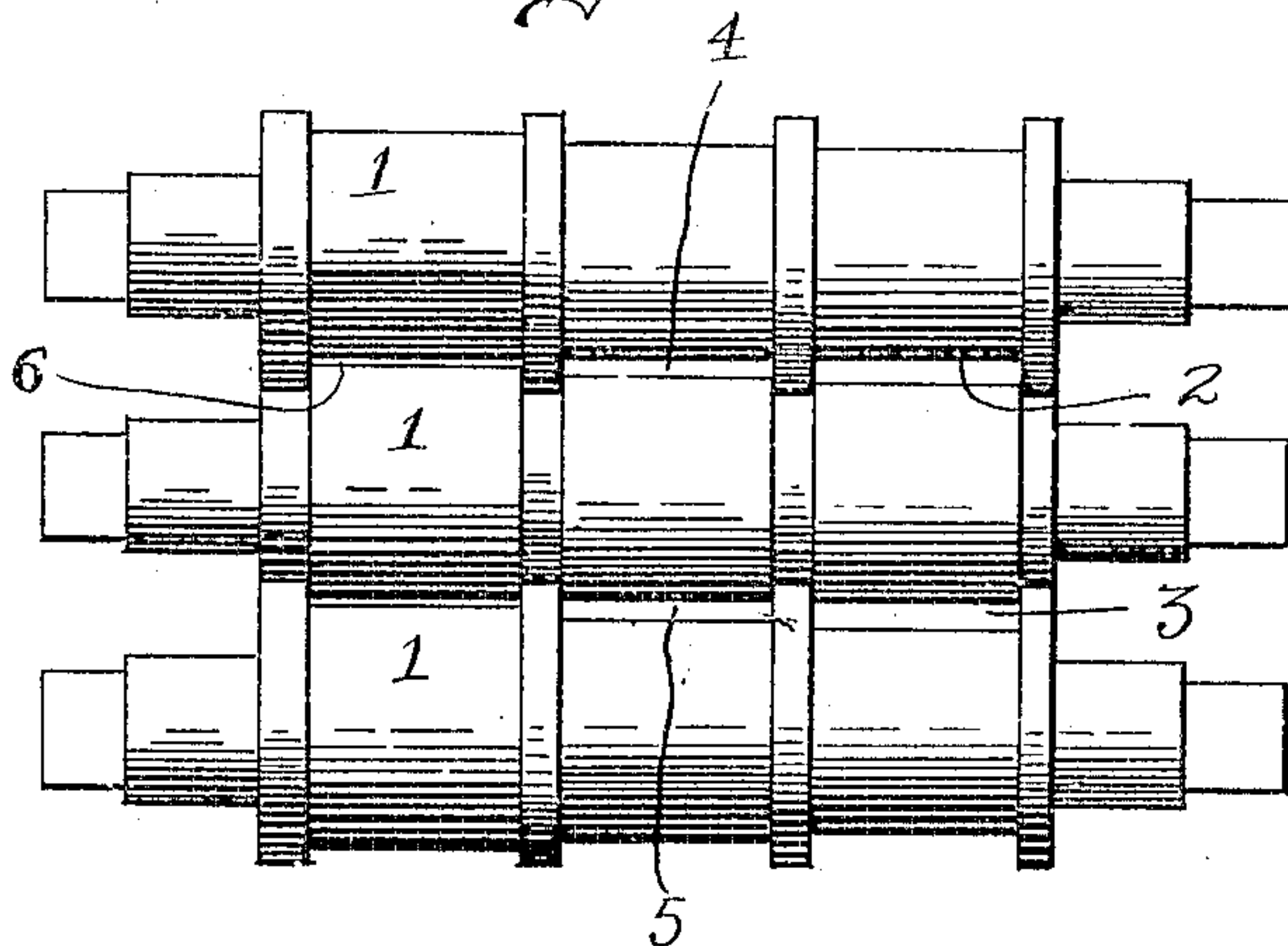


Fig. 5.



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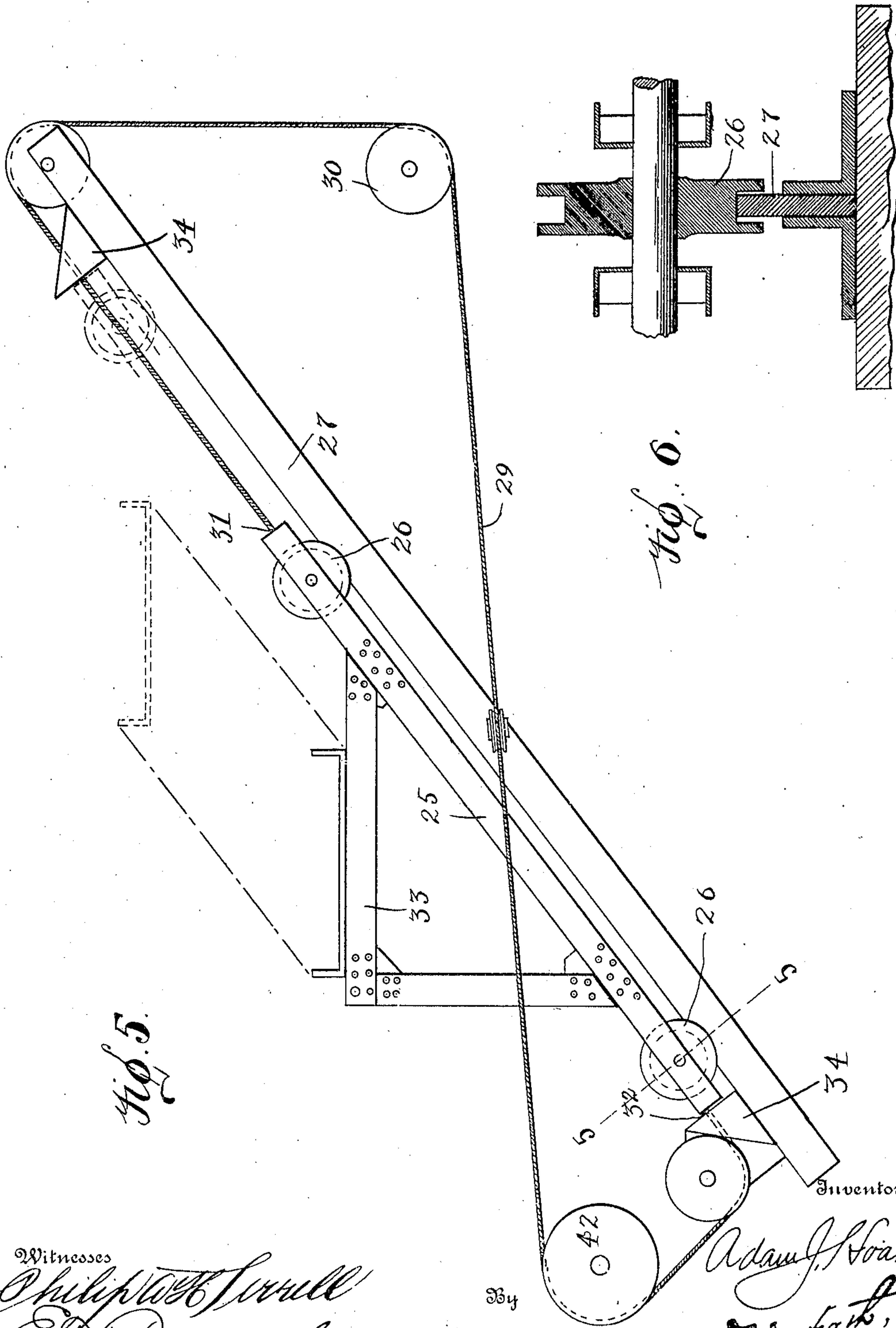
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MECHANISM FOR HANDLING METAL IN ROLLING MILLS.

APPLICATION FILED SEPT. 12, 1905.

4 SHEETS—SHEET 4.



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UNITED STATES PATENT OFFICE.

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MECHANISM FOR HANDLING METAL IN ROLLING-MILLS.

No. 843,395.

Specification of Letters Patent.

Patented Feb. 5, 1907.

Application filed September 12, 1905. Serial No. 278,117.

To all whom it may concern:

Be it known that I, ADAM J. HOAK, a citizen of the United States, residing at Kewanee, in the county of Henry and State of Illinois, have invented certain new and useful Improvements in Mechanism for Handling Metal in Rolling-Mills; and I do hereby 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.

The object of my invention is generally the provision of tables for handling and conveying skelp and flat bar-iron in rolling-mills. More specifically the object is by the peculiar and novel construction of movable in connection with fixed tables to facilitate the handling of material going through the rolls, thus to minimize labor and save the work of a number of men employed in the usual methods of handling such material, consequently saving much money and enabling mill owners to sell their output at a much lower figure and still realize the customary profit.

With these objects in view and others appearing as the specification proceeds the invention consists in the novel construction, combination, and arrangement of parts, as hereinafter fully described in the specification, summed up in the claims, and illustrated in the drawings.

In the accompanying drawings, Figure 1 is a side elevation of my novel arrangement of tables and rolls, the movable carriages underneath and supporting the inner ends of the movable tables being omitted for clearer illustration of other parts. Fig. 2 is a plan view thereof, the movable carriages being likewise omitted for the same reason. Fig. 3 is a detail view in front elevation of the "roughing-rolls." Fig. 4 is a detail view in front elevation of the "strand-rolls." Fig. 5 is a detail view of one of the carriages for operating the movable tables and of the inclined track on which the carriage moves, (one carriage being provided for each movable table, and Fig. 6 is a section on line 5 5, Fig. 5.

Referring to the drawings in detail, 1 designates a set of three-high roughing-rolls, affording passes 2, 3, 4, 5, and 6, which rolls may be mounted and driven in the usual manner. Journaled in the floor 7 near the lowermost roll are, desirably, small feeding rollers 8, driven by any suitable means.

Leading (desirably in a downward incline) from pass 6 is a fixed table 10. At the end of fixed table 10 is the lowermost of three-high strand-rolls 11, affording passes 12, 13, and 14, which rolls may be suitably driven and are constructed to be interchangeable—that is, when worn by use they can be reversed by placing the top roll at the bottom and the bottom roll at top. On the left-hand end or opposite side of the strand-rolls is another fixed (preferably downward-inclined) table 15, its lower end in proximity to pass 14.

With one end normally in proximity to pass 13 on the right-hand side of strand-rolls 11 is a movable table 16, suitably pivoted, as at 17, at its extreme outer end and constructed for simultaneous downward and sidewise swinging movement and for return to normal position, as will appear more fully in the general description of the operation. With one end normally in proximity to pass 12 on the left-hand side of strand-rolls 11 is another movable table 18, pivoted at 19 and adapted for simultaneous upward and sidewise swinging movement and for return to normal position, as will appear more fully in the general description of the operation.

Located in proximity to the outer end of each movable table 16 and 18 is a set of two-high small feed-rollers 20 and 21, adapted to force iron forward or back into the passes.

In proximity to the outer end of fixed table 15 is preferably a set of two-high "bull-heads" or finishing-rolls 23, suitably mounted and driven, as in the usual manner.

Each movable table 16 and 18 may be actuated (see Fig. 5) by a carriage 25, located beneath and supporting the inner ends thereof, the carriage having wheels 26, running on an inclined track 27, disposed transversely beneath the tables and suitably secured and supported in any preferred manner. The carriage has a raised platform 33, on which rests the free end of the movable table. Buffers 34 may be provided at either end of the track, if desired. An endless cable 29, which passes over a small drum 30 under the floor of the mill, may be connected at 31 and 32 with the carriage. On each side of strand-rolls is a hand-lever 24, (see Fig. 1, only one being shown,) suitably pivoted, as at 28, and connecting toward its lower end with a shaft 35, suitably journaled in supporting-bearings and carrying fast thereon two bevel-gears 36 and 37 and a drum 42, around

which latter passes said cable 29, attached to carriage. Suitably journaled in supporting-bearings in proximity to gears 36 37 is a shaft 38, Fig. 2, carrying fast thereon a sprocket-wheel 39, meshing with an endless sprocket-chain 40 for operating the strand-rollers, as shown, and also carrying fast thereon a bevel-gear 41 (in proximity to gears 36 37) and a pulley 42^a, connecting by belt with any suitable source of power in use at the particular mill, whereby shaft 38 is driven. This novel arrangement for actuating the movable tables I deem an important and essential feature of my invention, as it provides a most easily-operated and efficient device for the purpose desired.

In the operation of the mechanism of my invention the iron or steel bloom or ingot enters pass 2 from the right-hand side and is forced through by the operation of the roughing-rolls 1, from whence it drops down onto the small feeding-rollers 8, which then cause the iron or steel ingot again to approach the roughing-rolls from the left-hand side and to go through pass 3. The iron at this point after leaving pass 3 is caught up by men with hooks or tongs and delivered to pass 4 from the right-hand side, and when forced through pass 4 by the operation of the roughing-rolls 1 it drops down onto the feeding-rollers 8 and is by them delivered to pass 5 and forced therethrough by the operation of the roughing-rolls. It is then again caught up by men with hooks to pass 6, and after traveling through pass 6 the bloom or ingot is delivered onto downward-inclined fixed table 10, from whence it goes to pass 12 in strand-rolls 11 and by the operation thereof is forced therethrough. After going through pass 12 the bloom is delivered onto movable table 18. Hand-lever 24 is then moved in the proper direction, to the right or to the left, which causes connected shaft 35 to move, throwing the proper bevel-gear 36 or 37, fast thereon, into mesh with bevel-gear 41, which is driven through the medium of pulley 42, connecting by belt with a suitable source of power. Drum 42, over which passes the carriage-operating cable 29, is thus caused to revolve, the cable pulling carriage 25 upward on the inclined track, thereby swinging movable table 18 (one end of which is supported upon the platform 33 of said carriage 25) simultaneously upward and from right to left in a position to permit passage of the iron or steel on the table to pass 13, the iron being forced therethrough by the operation of the strand-rolls and onto movable table 16. The other carriage 25 is then caused to move, (in the manner just described,) permitting table 16 to drop or swing simultaneously downward and from right to left in position to deliver the iron or steel to pass 14, being drawn therethrough by the operation of the strand-rolls. After

going through pass 14 the iron or steel is delivered onto fixed table 15 and is driven along this table by feed-rollers 22, suitably driven, being finally delivered to the bull-heads or finishing-rolls 23.

When the carriage reaches the upper or the lower position, the gears are automatically disconnected by means of wedge-shaped lugs on the gears or the like.

It will be noted that I do away with cogs, gears, and other like devices usually employed for elevating the movable tables at both ends, as is customary, and in lieu thereof construct my novel form of movable tables and mechanism for operating the same, whereby the tables are pivoted at one end and swung on an incline from right to left at the other end by means of the carriage running on the inclined track disposed transversely of and underneath the tables. This greatly simplifies the usual construction and renders the operation more easy and perfect. In other words, my tables are moved with less machinery, power, and damage to workmen than those in ordinary use.

As previously noted, my strand-rolls are interchangeable—that is to say, it will be observed that I use only three out of the six passes provided in the strand-rolls, (as shown by the arrows in Fig. 4)—namely, passes Nos. 12, 13, and 14, (being the lower right-hand pass, the central upper pass, and the lower left-hand pass,) so that when these passes become worn in use I interchange the rolls—that is, what has been the lower roll I place on top and remove what has been the upper roll and place it on the bottom, whereby three previously-unused passes are brought into play, whereby the usual length of life of the ordinary form of strand-rolls is exactly doubled by my method and means, and this feature of interchangeability and the use of but three out of the six passes I deem an important and valuable feature of my invention.

Minor details may be changed without departing from the spirit of my invention—as, for instance, drum 42 may be operated directly by means of an electric motor stopping automatically when the carriage reaches the upper or the lower position. All such changes in the details of construction I deem to come strictly within the scope and purview of my invention.

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

1. In rolling-mill apparatus, a set of three-high rolls, formed with passes therebetween, a movable table, the inner end of which is in proximity to one of the passes in the rolls and the outer end of which is pivotally supported, an inclined track disposed transversely of and beneath the table, means movable on the track and supporting said inner end of the table, whereby to bring the table from a posi-

tion in line with a lower end pass to a position in line with the upper pass, and vice versa, and a power-driven mechanism connecting both with the rolls and with the supporting means for the table for moving the same.

2. In rolling-mill apparatus, a set of three-high rolls, formed with passes therebetween, a movable table, the inner end of which is in proximity to one of the passes in the rolls and the outer end of which is pivotally supported, an inclined track disposed transversely of and beneath the table, a truck supporting said inner end of the table and movable on the

track, whereby to bring the table from a position in line with a lower end pass to a position in line with the upper pass, and vice versa, and a power-driven mechanism connecting both with the rolls and with the truck for moving the same.

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

ADAM J. HOAK.

Witnesses:

EDWIN J. FAULL

C. C. WILSON.