

E. A. LANE.  
STRAIGHTENING MACHINE.  
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928,672.

Patented July 20, 1909.

Fig. 1.

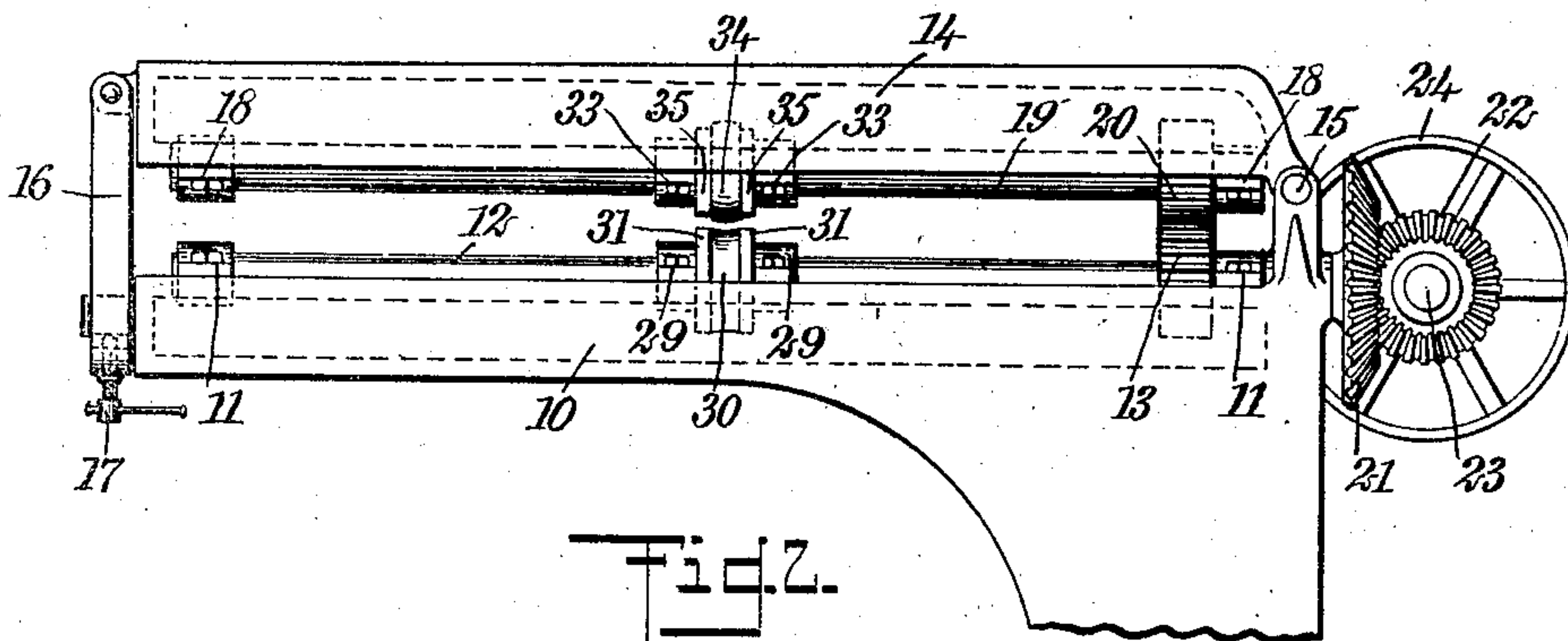


Fig. 2.

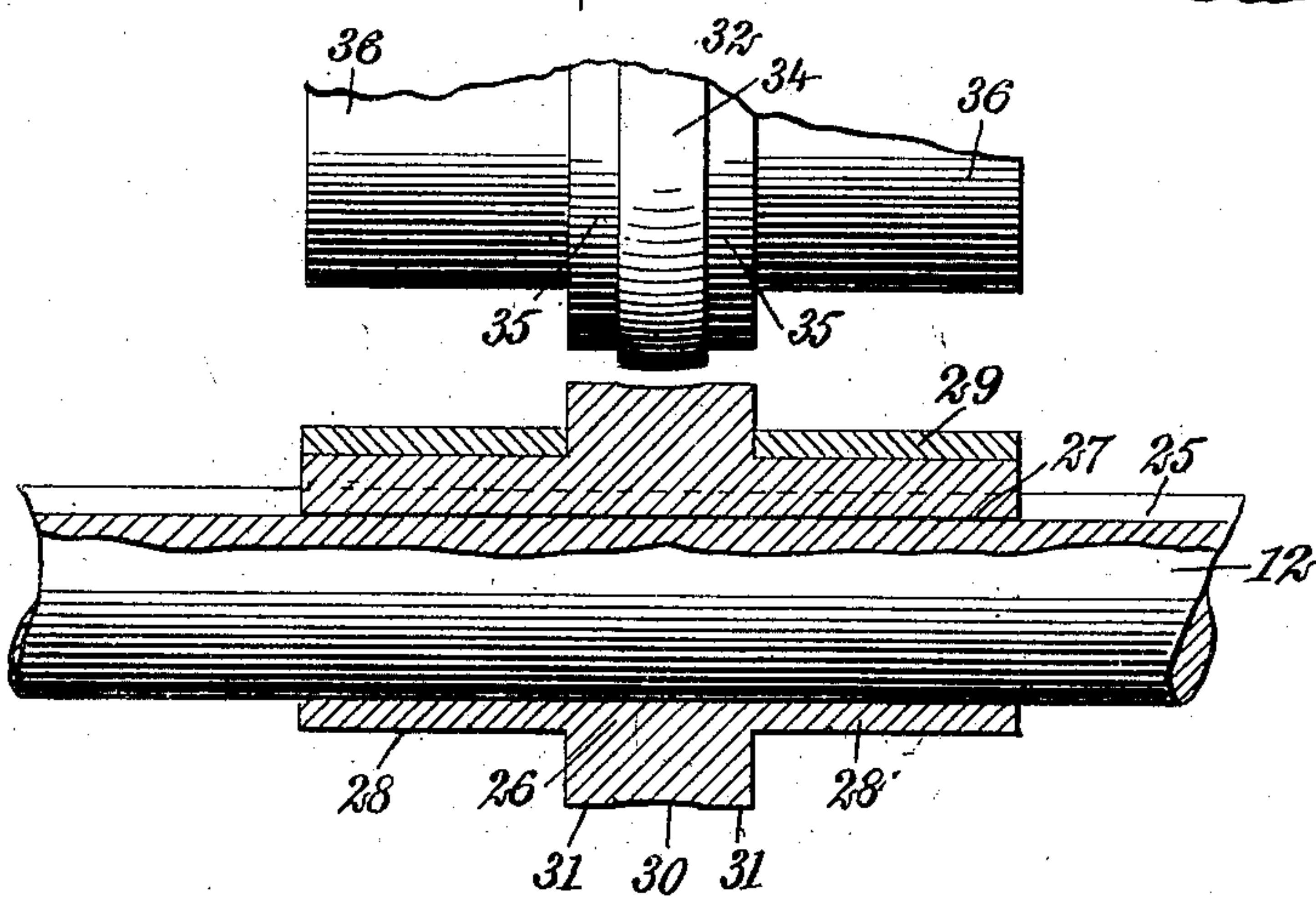
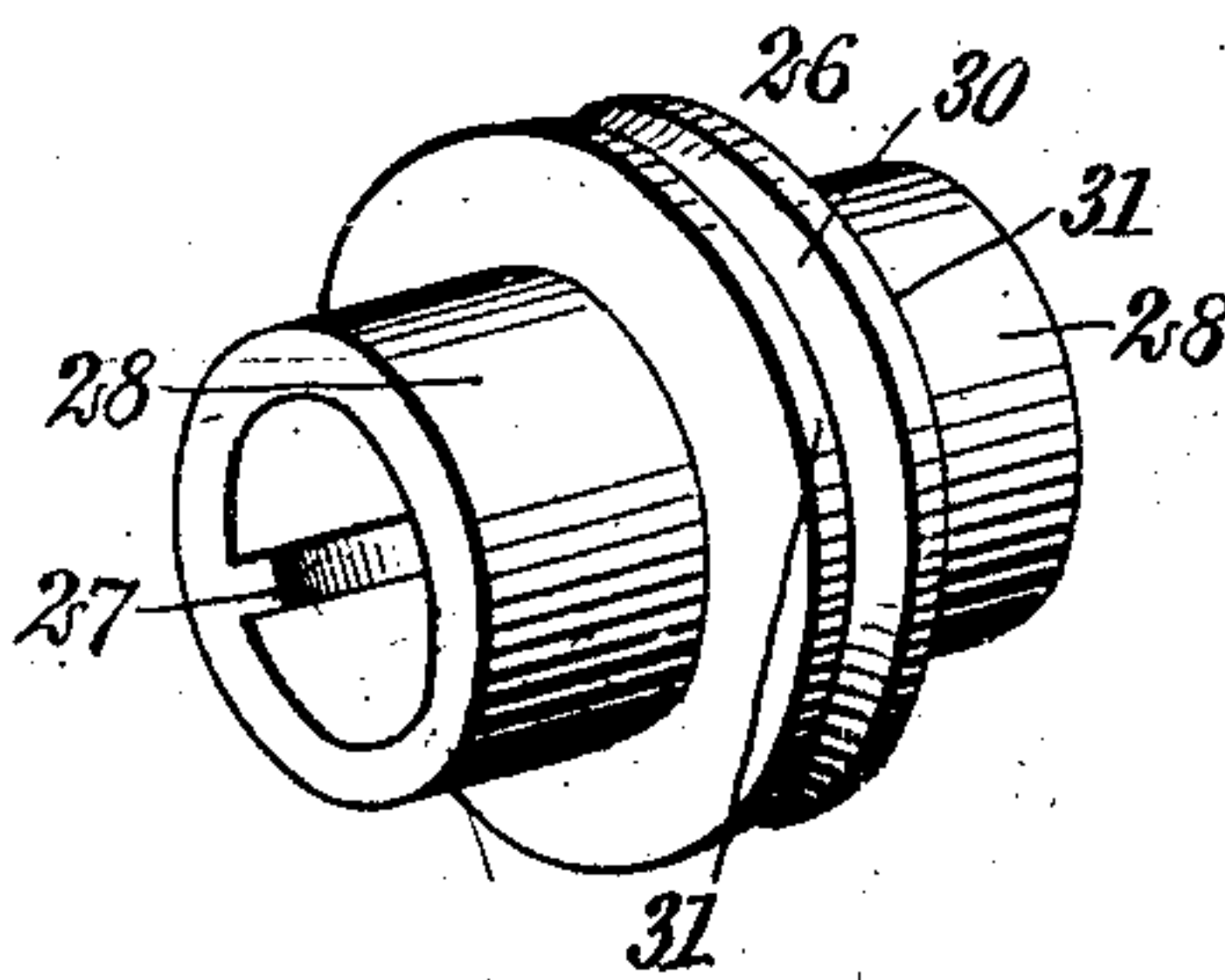


Fig. 3.



WITNESSES

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# UNITED STATES PATENT OFFICE.

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## STRAIGHTENING-MACHINE.

No. 928,672.

Specification of Letters Patent.

Patented July 20, 1909.

Application filed January 13, 1909. Serial No. 472,060.

*To all whom it may concern:*

Be it known that I, ERNEST A. LANE, a citizen of the United States, and a resident of Fulda, in the county of Placer and State of California, have invented a new and Improved Straightening-Machine, of which the following is a full, clear, and exact description.

This invention relates to straightening machines for removing bulges, dishes, dents and the like from metal, and especially from band saws, and relates more particularly to a machine of this class having removable rolls, one of which has an annular concave part spaced inwardly from the edges of the roll whereby the latter has flat parts at each side of the concave part, and a second roll having a convex part adapted to fit into said concave part, the second roll having at each side of the convex part, flat portions.

The object of the invention is to provide a simple, efficient and durable straightening machine for removing dishes, bulges, dents and other irregularities from sheet metal, and particularly from band or other saws, which does not affect the tension of the metal upon which it operates, and which does not draw the metal nor flatten the swage of the teeth when the saws are being straightened close to the edges, and in which the rolls are removable so that they can be applied to machines for this purpose and of different types.

The invention consists in the construction and combination of parts to be more fully described hereinafter and particularly set forth in the claims.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views, and in which—

Figure 1 is a front elevation showing an embodiment of my invention; Fig. 2 is an enlarged elevation showing a portion of the convex roll, and the concave roll, the latter being partly in section and being shown mounted adjustably upon a shaft; and Fig. 3 is a perspective view of the concave roll.

Before proceeding to a more detailed explanation of my invention, it should be clearly understood that in certain industries and for various purposes, it is necessary to straighten sheet metal and the like by removing therefrom, dents, bulges, dishes and

other irregularities which have been caused accidentally, or by the exigencies of certain mechanical operations. For example, in sawing lumber with band saws, the saws are held movably in place by means of guides, which are spaced inwardly from the edges of the saw a distance of approximately one and one-half inches, and as it often happens that a board is set out before the log clears the saw, the latter is bent or dished over the edges of the guides. Again, the log-holding dogs often break or pull out and thereby permit the log to turn on the saw and thus dish the same. In these and various other ways, the saws are dished, with the result that their operation is seriously interfered with. Hitherto, saws have usually been straightened with a hammer, for as far as was known there was no machine that would straighten them without stretching the steel. By means of my concave rolls a saw can be straightened in one-quarter of the time necessary to perform this operation with a hammer. The concave rolls will not stretch the steel, and I have found that saws when straightened thereby, instead of by means of a hammer, will usually last longer.

My invention resides primarily in the provision of rolls which are movably mounted upon the shafts of the machine and which are formed to remove the irregularities from sheet metal when the same is passed therebetween. My rolls can be applied to different types of machines and can be used for example, in connection with saw stretching machines. I wish to emphasize that the purpose of my machine is not to stretch the saw but to remove the irregularities therefrom.

I am aware that concave and convex rolls have hitherto been employed in saw stretching machines, but I provide rolls which have respectively, concave and convex portions, and at each side of these portions flat parts which present no curvature in the direction of the longitudinal axes of the rolls. These flat surfaces receive the surface of the saw or other metal, so that the edges of the concave and convex parts of the rolls cannot injure the metal by impressing grooves or lines therein; such grooves or lines would tend materially to stretch or weaken the saw. The curved rolls hitherto employed in saw stretching machines were usually of considerable width and the curvature, either convex or concave, extends from edge to



edge of the rolls. Owing to the width of the rolls the saw blade is easily pressed to the bottom of the curved roll. Consequently, if the rolls are not pressed together tightly enough to stretch the steel, the saw blade will spring back into the same shape which it had before, whereby it is practically impossible to straighten the saw with a roller of the type described above, without stretching the steel.

I prefer to have the concavity of the one roll quite shallow, as is clearly shown in Fig. 2, so that the convex part of the other roller projects a distance in excess of the depth of the concavity. It is not necessary for the flat parts of both rolls to engage the blade. The primary purpose of these flat parts is to prevent the effective edges of the rolls from injuring the blade.

Referring more particularly to the drawings, 10 represents the body of a straightening or stretching machine of any suitable type, having bearings 11 in which is journaled a shaft 12. The latter has rigid therewith a gear wheel 13. Above the body 10 is arranged a frame 14 having at one end a hinge connection 15 with the body, and being adjustably connected at the other end with the body by means of a link 16. An adjustable screw 17 permits the link to be raised or lowered, for a purpose which will appear more clearly hereinafter. The frame 14 has bearings 18, in which is journaled a second shaft 19, having rigid therewith a gear wheel 20, in mesh with the gear wheel 13.

The shaft 12 at one end projects beyond the machine and carries a bevel gear 21, in mesh with a bevel gear 22, mounted upon a driving shaft 23, journaled at the side of the machine body and adapted to be driven by a pulley 24, belted to a prime mover, or in any other suitable manner.

The shaft 12 has extending longitudinally thereof, a kerf or key-way 25. A roll 26 is slidably arranged upon the shaft 12 and has a key 27 engaging movably within the key-way, so that the roll is constrained to rotate with the shaft but is free to move longitudinally thereof. The roll, at each end, has an extension 28 adapted to be engaged by an adjustable keeper 29 mounted upon the machine body so that the roll can be held movably in place at a plurality of points. Spaced inwardly from the edges of the roll is an annular concave part 30 of any suitable curvature, and at each side of the part 30 is located an annular flat part 31.

The shaft 19 has arranged thereon a roll 32, which, like the roll 26, is slidable longitudinally of the shaft though constrained to rotate therewith. Keepers 33 serve to hold the roll 32 in any one of a plurality of positions, and the roll 32 has a central convex part 34 and at each side thereof a flat part 35. The keepers 33 engage roll extensions or ends 36, as in the case of the lower concave roll.

By means of the adjusting screw 17 the frame 14 can be raised or lowered through the agency of the link 16. In this way the rolls can be brought together or separated in accordance with the necessities of the operation of the machine. When the metal is pressed between the rolls, any bulges or dents or the like are forced by the convex part of the upper roll into the concave part of the lower roll, and are thus straightened out. The flat parts 31 and 35 of the respective rolls prevent the edges of the convex and concave parts from injuring the same.

Having thus described my invention, I claim as new, and desire to secure by Letters Patent:

1. In a machine of the class described, a roll having an annular concave part and at each side of said part and extending to an effective edge of said roll, an annular flat part, and a second roll having an annular convex part, and at each side of said annular convex part an annular flat part extending to an effective edge of said second roll, said convex part projecting a distance exceeding the depth of said concave part.

2. In a machine of the class described, a shaft having a keyway longitudinally thereof, a removable roll slidable upon said shaft and having a key engaging within said keyway, said roll having spaced inwardly from the edges thereof a concave groove, a second shaft having a keyway longitudinally thereof, and a removable roll slidable upon said second shaft, and having a key engaging within said keyway of said second shaft, said last-mentioned roll having spaced inwardly from the edges thereof, a convex, annular extension said extension projecting a distance exceeding the depth of said concave groove of said first roll.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ERNEST ANDREW LANE.

Witnesses:

AUSTIN ERSKINE,  
W. W. LANE.