No. 874,036. PATENTED DEC. 17, 1907.

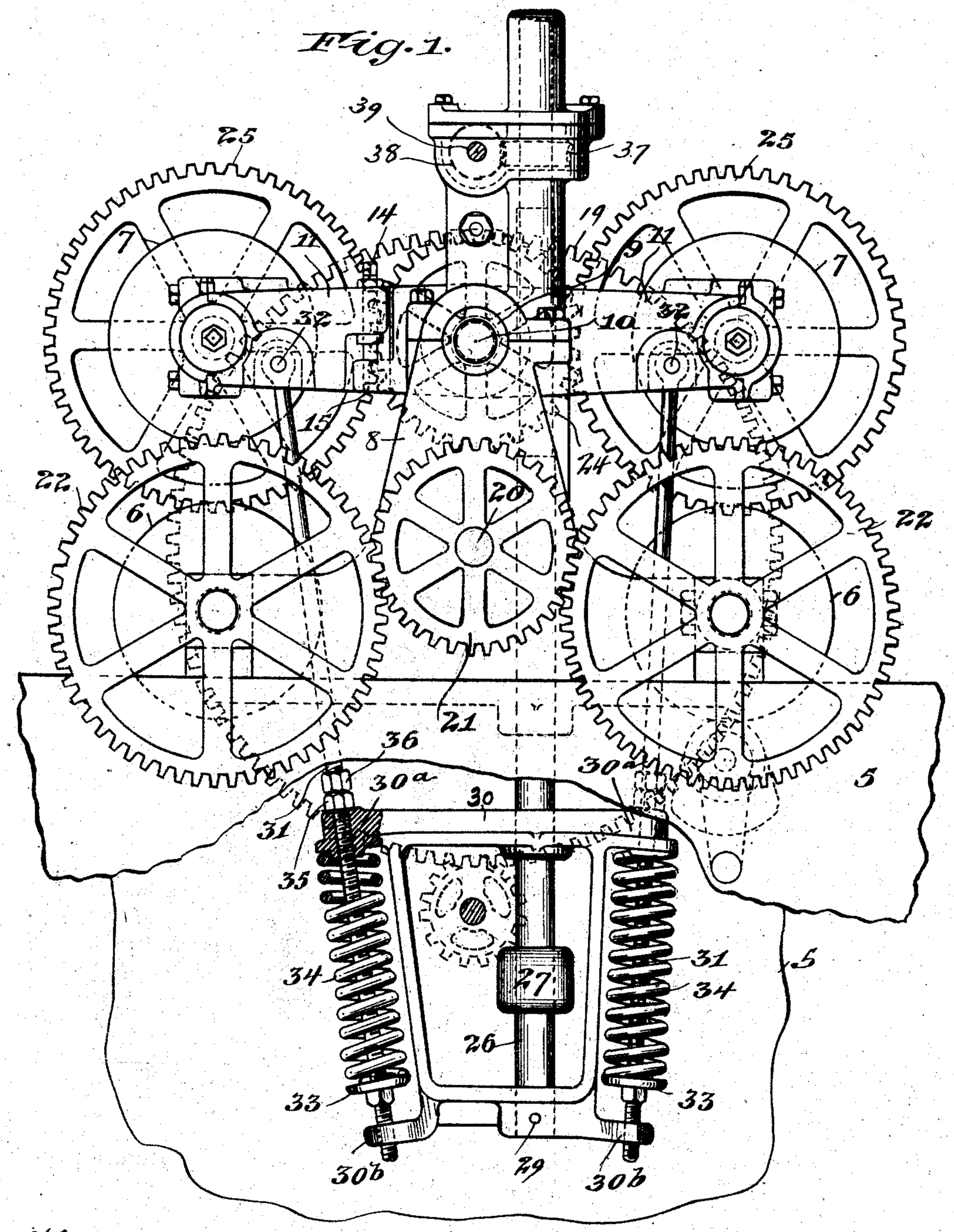
H. B. ROSS.

FEED MECHANISM FOR PLANING MACHINES.

APPLICATION FILED JULY 25, 1904.

4 SHEETS—SHEET 1.

Fig. 1.



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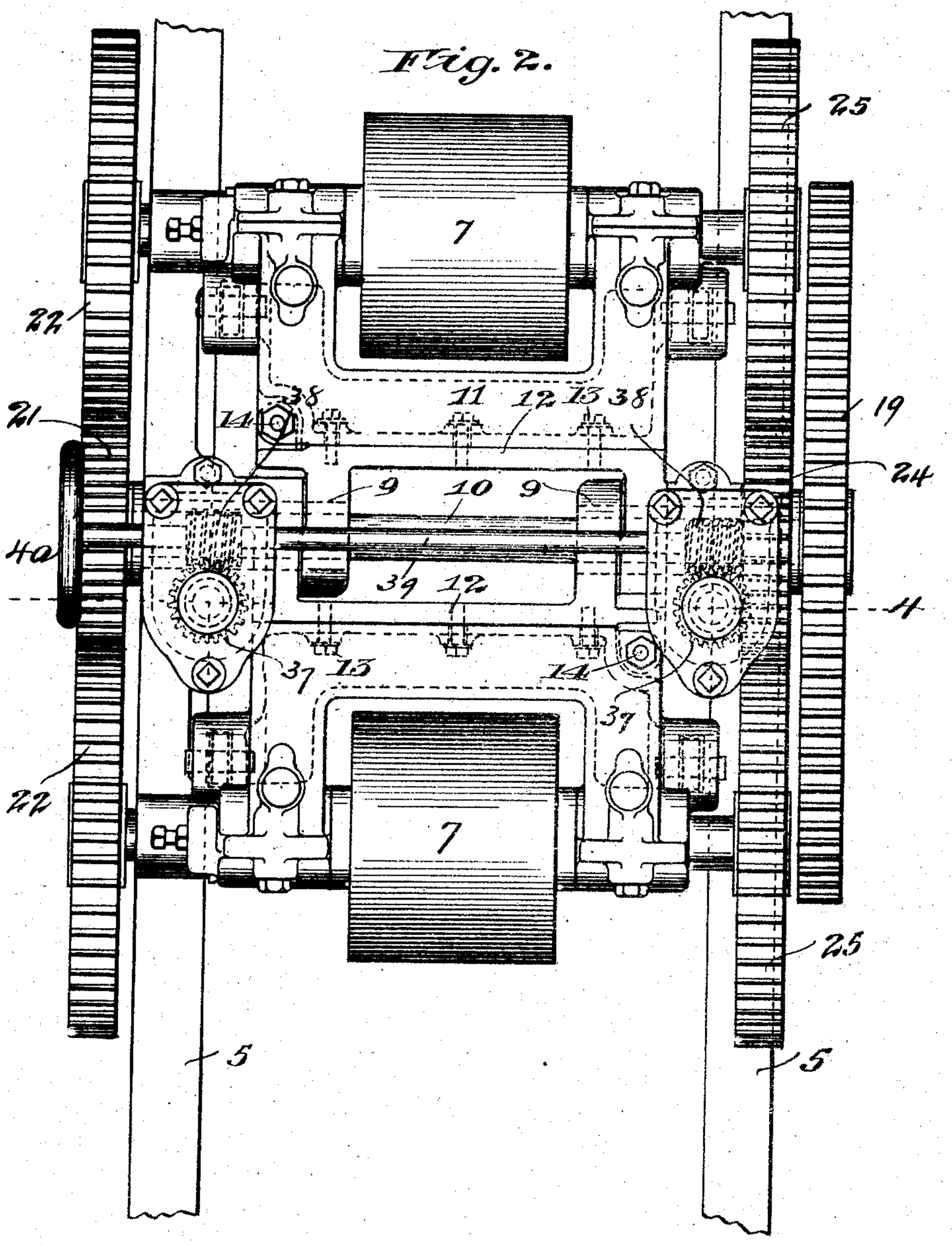
4 SHEETS—SHEET 2.

Fig. 2.



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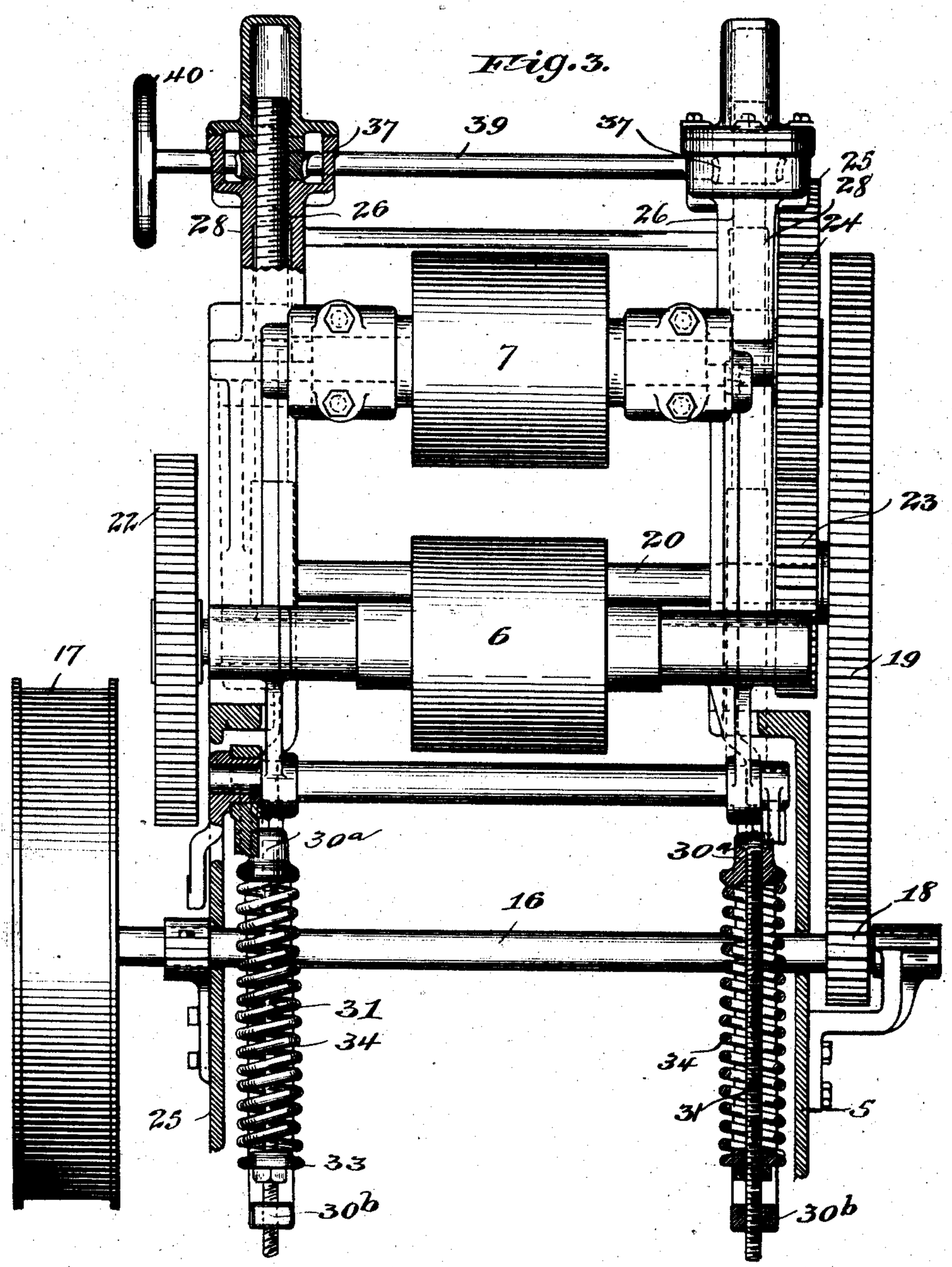
4 SHEETS—SHEET 3.

Fig. 3.



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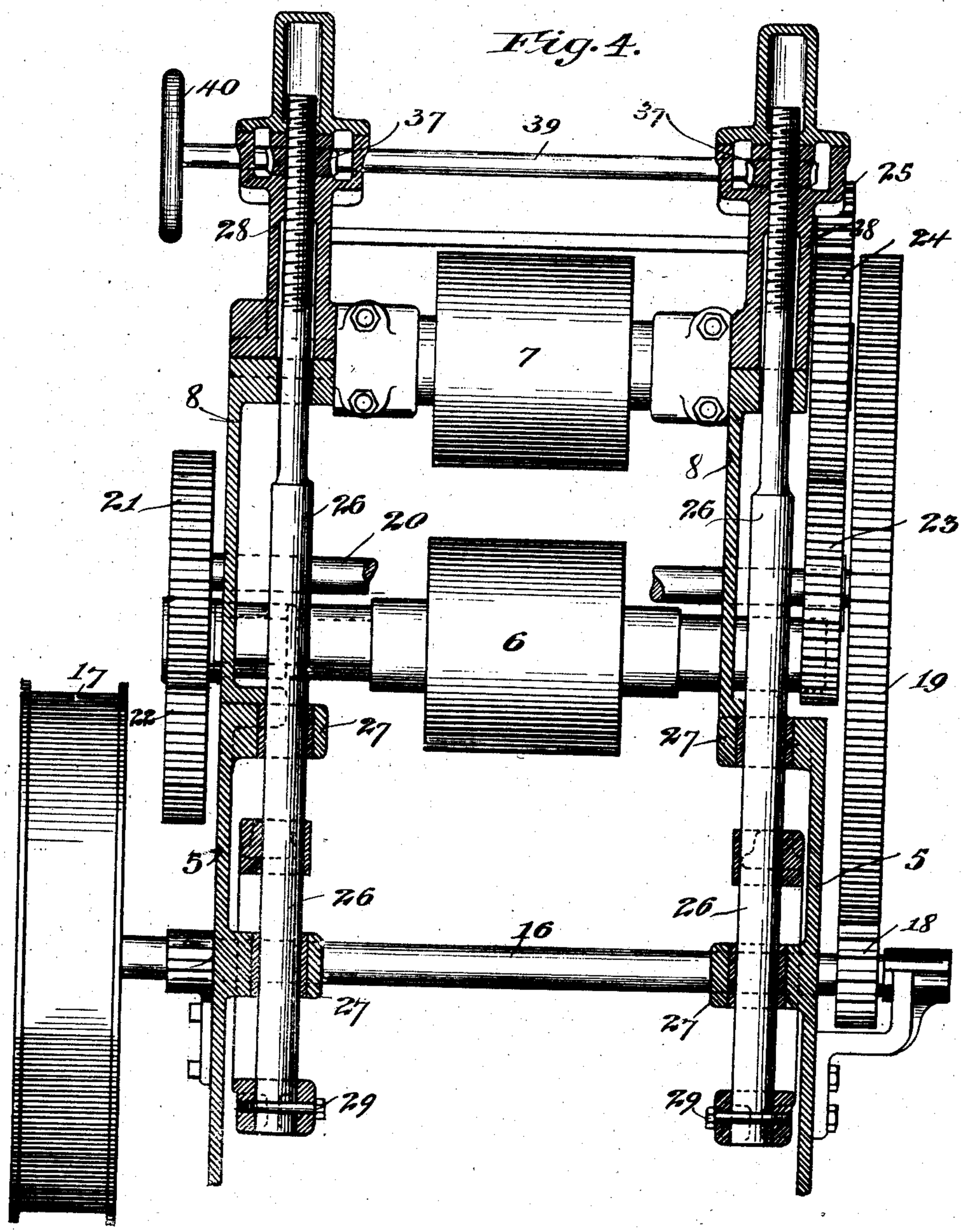
4 SHEETS—SHEET 4.

Fig. 4.



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UNITED STATES PATENT OFFICE.

HARRY B. ROSS, OF BELOIT, WISCONSIN, ASSIGNOR TO THE BERLIN MACHINE WORKS, OF BELOIT, WISCONSIN, A CORPORATION OF WISCONSIN.

FEED MECHANISM FOR PLANING-MACHINES.

No. 874,036. Specification of Letters Patent. Patented Dec. 17, 1907.

Application filed July 25, 1904. Serial No. 218,021.

To all whom it may concern:

Be it known that I, HARRY B. ROSS, a citizen of the United States, residing at Beloit, in the county of Rock and State of Wisconsin, have invented certain new and useful Improvements in Feed Mechanism for Planing-Machines, of which the following is a specification.

My invention relates to feed mechanism for planing and other machines adapted to treat lumber; and has for its principal object to provide a new and improved mechanism for mounting the upper rolls and for adjusting their position relatively to the stationary lower rolls at the same time preserving the elastic yieldable capabilities of the upper rolls which are necessary by reason of variations in thickness of the lumber handled by the machine.

A further object of the invention is to provide a new and improved gearing between the several feed-rolls of the machine so applied as to balance and uniformly distribute the driving strains.

To these ends my invention consists in a new and improved feed-roll mechanism possessing the peculiarities of construction and operation substantially as hereinafter described and more particularly pointed out in the claims.

Referring to the accompanying drawings, wherein I have shown a preferred mechanical embodiment of my invention,—Figure 1 is a side elevational view of the feed-roll mechanism of a planing or similar machine, partly broken away and in section; Fig. 2 is a top plan view of the same parts; Fig. 3 is an end elevational view, partly in vertical section through the yieldable mechanism for supporting the upper roll; and Fig. 4 is a vertical transverse section through the housings of the upright adjusting rods, substantially on the line 4—4 of Fig. 2.

Referring to the drawings, 5 designates a portion of the horizontal machine-frame on which the feed-roll mechanism is mounted. The feed-rolls are usually arranged in front and rear pairs, each pair comprising a stationary lower roll and a yieldable and vertically-adjustable upper roll coöperating therewith.

The stationary lower rolls are designated by 6 and the adjustable upper rolls coöperating therewith by 7. The lower rolls 6 are suitably journaled across the frame of the machine, and between the journals of said rolls on each side of the machine-frame rises a roll-stand 8, in the upper ends of which roll-stands are clamped inwardly-projecting bushings 9, said bushings receiving a cross-shaft 10 journaled therein, and having hinged thereon the inner ends of a pair of oppositely-extending roll-carriers or housings 11 having suitably journaled in their outer forked ends the upper feed-rolls 7. The roll-carriers 11 are hinged on the bushings 9 by hinge members 12 (Fig. 2), said parts being connected at one end by horizontal screw-bolts 13 and at the opposite end by vertical adjusting-bolts 14, the lower ends of which are threaded into lugs 15 on the hinge members 12 so that by turning said vertical bolts that end of the roll-carrier is raised or lowered to effect the leveling of the upper roll with reference to the lower roll.

Describing next the mechanism for driving the rolls, 16 designates the driving-shaft journaled across the machine-frame beneath the feeding mechanism and carrying on one end the driving-pulley 17 and on its opposite end a spur-pinion 18. This latter meshes with a large gear 19 mounted on one end of a shaft 20 journaled in and between the roll-stands 8. The opposite end of the shaft 20 carries a gear 21 meshing with and driving gears 22 on the adjacent ends of the lower rolls 6. These gears are considerably larger in diameter than the diameter of the rolls driven thereby, and in the preferred practice are approximately twice the size of said rolls. On the shaft 20, just inside the large gear 19 is a gear 23 similar to the gear 21, which gear meshes with a superposed gear 24 mounted on one of the bushings 9, said gear 24 engaging and driving gears 25 on the shafts of the upper rolls 7, said gears 25 being similar in dimensions and function to the gears 22. By this arrangement and distribution of driving-gears, the lower rolls being driven on one side of the machine-frame and the upper rolls on the opposite side, the driving strains are distributed across the machine-frame and on both ends of the rolls, thus lessening the tendency to distort and displace the rolls from accurate working positions. Another and important advantage resulting from the described arrangement of gearing resides in the fact that the direct roll-driving gears 22 and 25 are enabled to be made much larger than where both pairs of gears are on

the same side of the machine, this arrangement providing more space for the accommodation of larger gears, and the employment of such larger gears reducing the breaking and wearing strains on the teeth of the gears.

Coming now to the principal feature of the present invention, which resides in the means for yieldingly supporting and adjusting the upper rolls, 26 designates each of a pair of screw rods, arranged one on each side of the machine-frame between the front and rear pairs of rolls, and slidably guided in inwardly-projecting lugs 27 of the machine-frame, their upper threaded ends being confined in vertical housings 28 mounted on the upper ends of the roll-stands 8. On the lower end of each rod 26 is mounted and secured, as by a pin 29 passed through the said parts, a skeleton frame or yoke designated as an entirety by 30, the rod 26 being secured to the lower transverse member thereof and passing through the upper transverse member. At the upper and lower ends of said yoke are edgewise projections 30^a and 30^b, respectively, which are apertured to slidingly receive connecting and supporting-rods 31, the upper ends of which are pivotally connected with the under sides of the roll-carriers 11, as shown at 32. Those portions of the rods 31 within and adjacent to the projections 30^a and 30^b of the yoke are threaded to receive, on their lower ends, adjustable followers 33 for compression-springs 34, and above the projections 30^a adjusting-nuts 35 and locknuts 36, the springs 34 abutting against the under sides of the projecting lugs 30^a. By reason of this mechanism it will be seen that the tension of the springs 34 is readily adjustable by adjusting the followers 33; while the nuts 35 and locknuts 36 constitute stops to limit the minimum distance between the upper and lower feed-rolls, and also constitute a means individual to each pair of rolls for finely adjusting the distance between said rolls. The upper ends of the rods 26 are somewhat reduced in diameter and externally threaded, as shown in Fig. 4, to receive worm-wheels 37 which are engaged and operated by worms 38 on a horizontal shaft 39 actuated by a hand-wheel 40. By turning the latter in one direction or the other the rods 26 are simultaneously and equally raised and lowered, thus simultaneously and equally raising and lowering the yokes 30 carried thereby and the roll-supporting rods 31 carried by said yokes, and thus simultaneously and equally adjusting the distance between the upper and lower rolls of each pair. By adjusting the nuts 35, the upper rolls may be individually set to proper working positions and relations to their coöperating lower rolls.

The mechanism hereinabove described and shown in the drawings pertains to the in-feeding rolls of a planing machine; but it is evident that the same mechanism is equally applicable to the out-feeding or delivery rolls. These latter are frequently constituted by a single pair of rolls instead of the double rolls employed for the in-feeding; and in such a case of course but a single roll-supporting rod would be required, and the frame or yoke carried by the adjusting rods would be correspondingly changed to accommodate a single rod instead of the pair of rods herein shown.

It is evident that variations and modifications in respect to the specific details of the mechanism as herein shown and described would readily occur to the mechanic skilled in this art, and might be made without departing from the principle of the invention or sacrificing any of the advantages thereof. Hence, I do not limit the invention to the particular form of mechanism herein shown and described, except to the extent indicated in specific claims.

I claim:

1. In a feed mechanism for planing and similar machines, the combination with a lower roll, an upper roll, and a hinged carrier for the latter having a fixed hinge-center, of a roll-carrier supporting member, and a slidably-mounted screw adjusting said supporting member, said screw acting as a carrier for said supporting member in its vertical movements, substantially as described.

2. In a feed mechanism for planing and similar machines, the combination with a lower roll, an upper roll, and a hinged carrier for the latter having a fixed hinge center, of a roll-carrier supporting member, connecting-rods between said roll-carrier and supporting member through which the former is supported by the latter, and a slidably-mounted screw adjusting said supporting member, said screw acting as a carrier for said supporting member in its vertical movements, substantially as described.

3. In a feed mechanism for planing and similar machines, the combination with a lower roll, an upper roll, and a hinged carrier for the latter, of a roll-carrier supporting member, a rod connecting the latter to the roll-carrier and transmitting the weight of said roll-carrier to said supporting member, means for vertically adjusting said supporting member, and means applied to said rod for yieldably maintaining the relative positions of said roll-carrier and its supporting member, substantially as described.

4. In a feed mechanism for planing and similar machines, the combination with a lower roll, an upper roll, and a hinged carrier for the latter, of a roll-carrier supporting member, a connecting-rod between the latter and the carrier through which said carrier is supported by said supporting member, a vertically-adjustable rod carrying said supporting member, and means applied to said con-

necting-rod for yieldably maintaining the relative positions of said roll-carrier and its supporting member, substantially as described.

5. In a feed mechanism for planing and similar machines, the combination with two pairs of upper and lower rolls, and hinged carriers for said upper rolls, of a yoke, connecting-rods between said yoke and each of said carriers, respectively through which the weight of the latter is transmitted to said yoke, a vertically-adjustable rod carrying said yoke, and means applied to said connecting-rods for yieldably maintaining the relative positions of said roll-carriers and yoke, substantially as described.

6. In a feed mechanism for planing and similar machines, the combination with two pairs of upper and lower rolls, and hinged carriers for said upper rolls having fixed hinge-centers, of a yoke disposed beneath and between said pairs of rolls, connecting-rods between said carriers and the opposite sides of said yoke, respectively, a vertically-adjustable rod on the lower end of which said yoke is suspended, and connections between said connecting-rods and the yoke for yieldingly maintaining the relative positions of said carriers and yoke, substantially as described.

7. In a feed mechanism for planing and similar machines, the combination with two pairs of upper and lower rolls, and hinged carriers for said upper rolls having fixed hinge-centers, of a yoke disposed beneath and between said pairs of rolls, connecting-rods between said carriers and the opposite sides of said yoke, respectively, elastic connections between said connecting-rods and said yoke, stops on said rods coöperating with said yoke to limit the downward movement of the former relative to the latter, and a vertically-adjustable rod on the lower end of which said yoke is bodily supported, substantially as described.

8. In a feed mechanism for planing and similar machines, the combination with upper and lower feed-rolls, of a spur-gear on one end of the lower roll exceeding in diameter the distance between the axes of said rolls, a similar spur-gear on the opposite end of the upper roll, a driving shaft, and driving connections between the latter and said roll-gears, substantially as described.

9. In a feed mechanism for planing and similar machines, the combination with two pairs of upper and lower feed-rolls, of spur-gears on one end of the lower rolls each having a diameter exceeding the diameter of the roll driven thereby, similar spur-gears on the opposite ends of the upper rolls, a driving shaft, and spur-gear driving connections between the latter and said roll-gears, substantially as described.

10. In a feed mechanism for planing and similar machines, the combination with two pairs of upper and lower feed-rolls, of spur-gears on one end of the lower rolls each having a diameter approximately equaling twice the diameter of the roll driven thereby, similar spur-gears on the opposite ends of the upper rolls, a counter-shaft disposed between said pairs of rolls, gearing between the ends of said counter-shaft and the respective roll-gears adjacent said ends common to both roll-gears, a driving shaft, and driving connections between the latter and said counter-shaft, substantially as described.

11. In a feed mechanism for planing and similar machines, the combination with upper and lower feed-rolls and a suitably supported hinge-pivot, of a carrier or housing for the upper roll, a hinge member mounted on said hinge-pivot, and connections between said hinge member and roll-carrier permitting relative vertical adjustment of the opposite ends of the latter for the purpose of leveling the upper roll, substantially as described.

12. In a feed mechanism for planing and similar machines, the combination with upper and lower feed-rolls and a suitably supported hinge-pivot, of a carrier or housing for the upper roll, a hinge member mounted on said hinge-pivot, and connections between said hinge member and said roll-carrier, said connections comprising a horizontal pivot-bolt at one end of said parts and a vertically-adjustable vertical connecting-bolt at the other end of said parts whereby one end of said roll-carrier may be raised or lowered relatively to its opposite end to level the upper roll, substantially as described.

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