C. W. H. BLOOD.

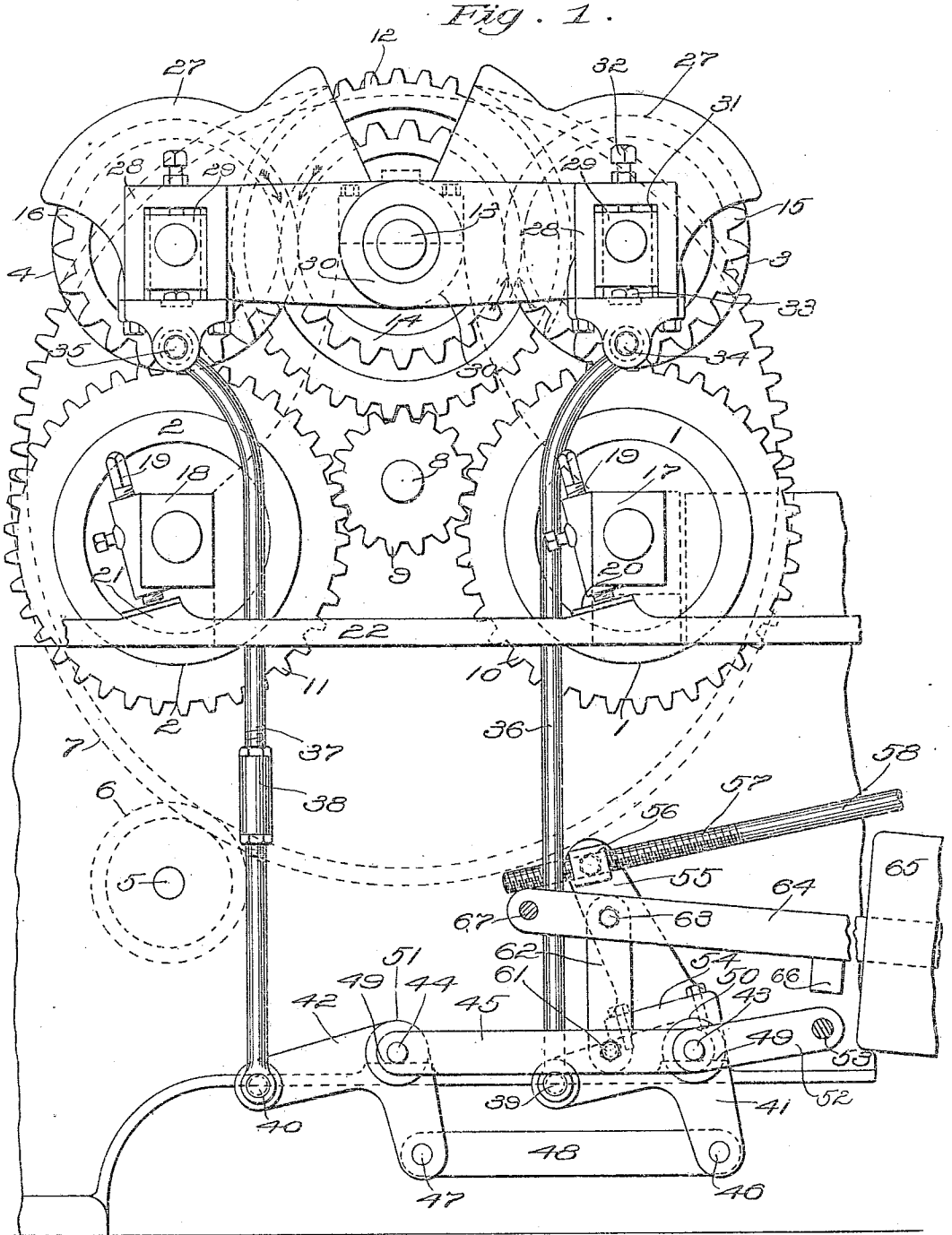
WORK FEEDING APPARATUS FOR WOOD PLANING MACHINES.

APPLICATION FILED APR. 16, 1908.

953,814. Patented Apr. 5, 1910.

3 SHEETS—SHEET 1.

Fig. 1.



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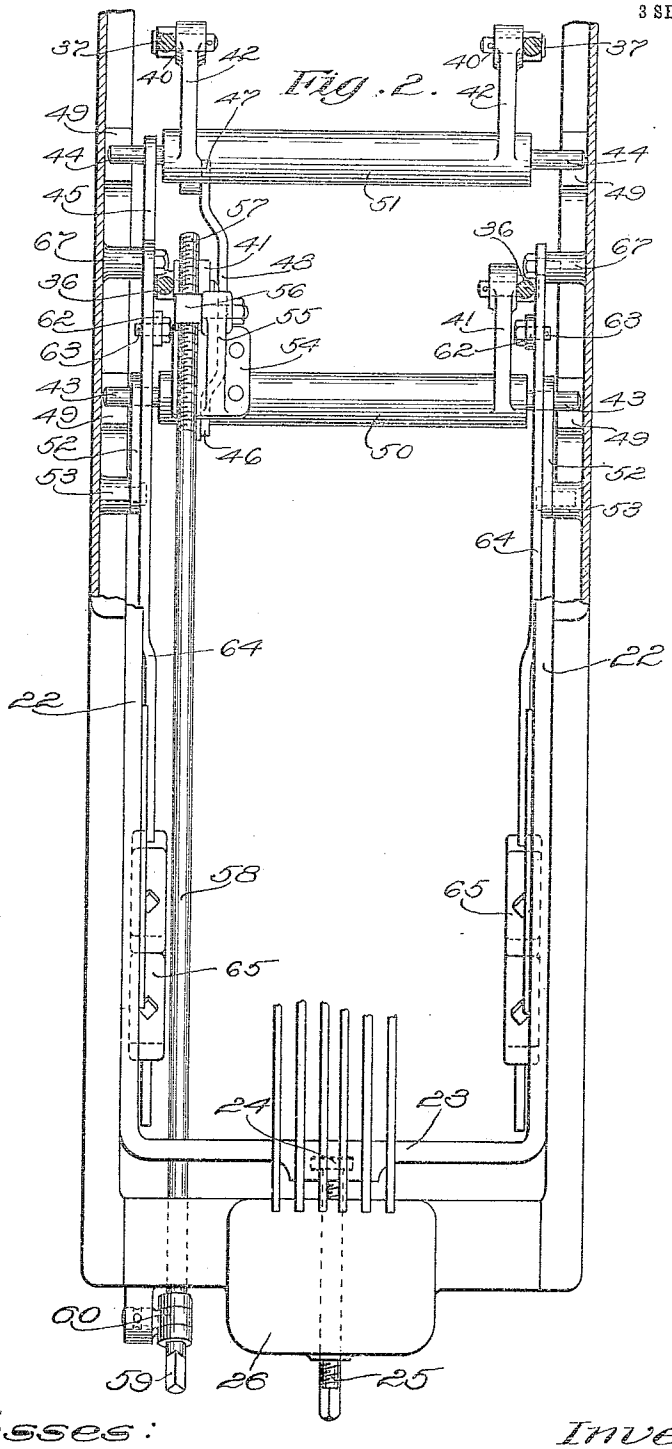
3 SHEETS—SHEET 2.

Fig. 2.



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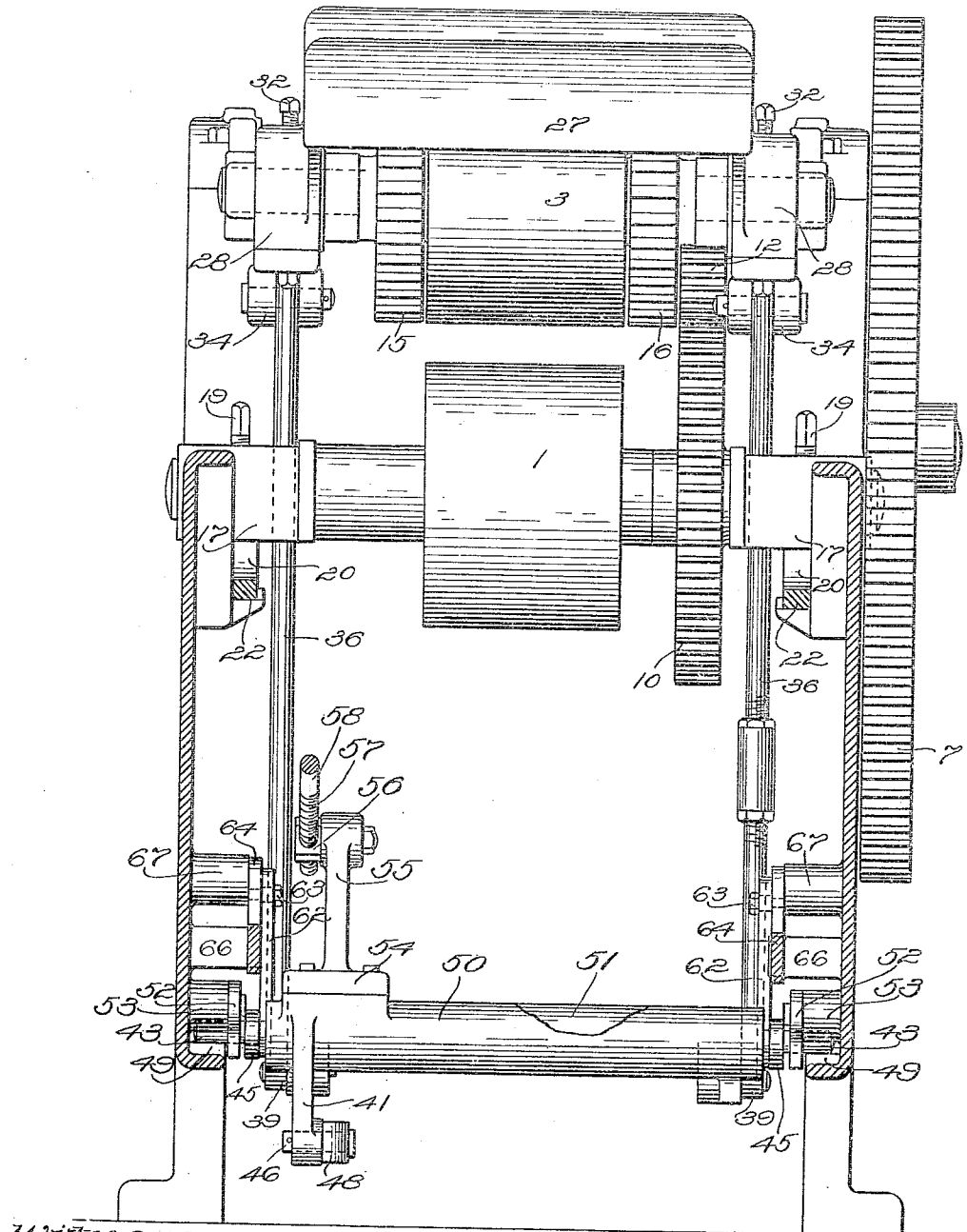
3 SHEETS—SHEET 3.

Fig. 3.



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UNITED STATES PATENT OFFICE.

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WORK-FEEDING APPARATUS FOR WOOD-PLANING MACHINES.

953,814. Specification of Letters Patent. Patented Apr. 5, 1910.

Application filed April 16, 1908. Serial No. 427,314.

To all whom it may concern:

Be it known that I, CHARLES W. H. BLOOD, a citizen of the United States, and resident of Winthrop, in the county of Suffolk and State of Massachusetts, have invented an Improvement in Work-Feeding Apparatus for Wood-Planing Machines, of which the following description, in connection with the accompanying drawings, is a specification, like numerals on the drawings representing like parts.

In wood-planing machines it is a common practice to feed the boards or timbers to the rotary cutters by means of four positively driven feed rolls, arranged in opposite pairs, two of the rolls engaging the timber on its upper side and the other two rolls on its lower side.

My present invention relates to the adjustment and mutual relations of these feed rolls, whereby the lower rolls may be either individually or simultaneously adjusted toward and from the upper rolls, and the upper rolls may be uniformly weighted at all times with a minimum movement of the weighting levers. Besides this I provide simple means for adjusting the upper rolls for different thickness of timber.

I provide an arrangement of levers and pivot links such that the weight lever remains in fixed position for all adjustments for thickness of timber, *i. e.* the movement of the hoisting or adjusting screw or device does not move the weight lever, the latter moving only in accordance with the yielding of the upper rolls to inequalities as the work passes through the machine. This yielding to inequalities of work is accomplished by a lifting movement of the weighting mechanism, *i. e.* by a movement bodily upward parallel to itself. Also my mechanism is preferably constructed so that it maintains an absolutely uniform pull on each of the two upper rolls, being so constructed as to compensate for or offset the pulling tendency of the driving gears which drive the rolls. By this means I get the same weight on both rolls,—a result of much practical value in modern high speed work.

In the drawings, in which I have shown a preferred embodiment of the invention, Figure 1 represents in side elevation a portion of the bed of a planing machine provided with my improved feeding mechanism; Fig. 2 is a top plan view thereof, the top portion being broken away and removed, in order to show the arrangement of the weighting mechanism; and Fig. 3 is a transverse sectional view showing the main portions of my apparatus in end elevation, as viewed standing at the ingoing end of the machine.

The lower feed rolls are indicated at 1, 2, and the upper feed rolls at 3, 4, being all positively driven from a power shaft 5 whose pinion 6 meshes with a large driving gear 7 on whose shaft 8 is a central pinion 9 meshing with gears 10, 11, fast on the shafts of rolls 1 and 2 respectively, and a gear 12 fast on a shaft 13 to which are also keyed gears 14 in mesh with gears 15, 16 fast on the shaft of the rolls 3, 4 respectively. The journal boxes 17, 18 of the two lower rolls carry adjusting bolts 19, shown in Fig. 1 as set obliquely and engaging inclines or wedge blocks 20, 21 of a U-shaped frame or plate 22 mounted to slide longitudinally on the top of the bed of the machine. The transverse end 23 of the frame 22 is engaged by the headed end 24 of a heavy adjusting bolt 25 threaded in the adjacent ingoing end 26 of the bed of the machine. By this means the lower rolls may be adjusted toward and from the upper rolls either individually or simultaneously, the individual adjustment being accomplished by tightening or loosening the bolts 19 and the simultaneous adjustment by tightening or loosening the bolt 25. By reason of these wedge inclines under the journal boxes of the lower rolls, the latter may be simultaneously adjusted at both ends. The initial leveling up of the rolls is accomplished by the screws 19, and the latter are relied upon also to compensate for wear. The screws 19 point upward, and are so located as to be easily accessible, so that not only the adjustment of these bolts 19 but also the bolt 25 is very convenient for the operator.

In working very heavy timber the under rolls need to be higher above the bed level than in working thin stock and hence it is

desirable to have means for simultaneously adjusting both of the under rolls without disturbing the individual adjustment given said rolls when the machine was originally leveled up. Each top roll is supported in a top yoke 27, which consists of a heavy casting extending across the width of the machine and provided at its opposite ends with a housing or guide 28 for the journal boxes 29 of the top rolls and a rearwardly extending ear 30 pivoted on the shaft 13. Both top yokes are constructed alike so that they can swing about the shaft 13 as a center in accordance with the required movements of the rolls 3, 4.

The housing or guide 28 of the journal boxes is machined to receive the journal boxes 29 and provide a shoulder 31 for said journal boxes to bear against, the latter being adjusted by top bolts 32 and bottom bolts 33. This provides for the individual adjustment of the top rolls. The provision for their simultaneous adjustment will now be described. At the under side of the yokes beneath the journal boxes are pivoted at 34, 35 bent rods or weight-supporting connections 36, 37, a turnbuckle being preferably interposed in one or the other of them for securing quick and accurate adjustment one with relation to the other. At their lower ends these connecting members 36, 37 are pivoted at 39, 40 to elbow levers 41, 42 connected by pivots 43, 44 to an equalizer link 45 and by pivots 46, 47 to a connecting link 48, the pivots 43, 44 projecting in the form of pins to rest at times on ledges 49 formed on the adjacent frame-sides, said pins being carried at the ends of transverse shafts 50, 51 extending between the two side frames of the machine, and pivoted on the pivots 43 are links 52 fixedly pivoted at 53 to the frame of the machine, these links 52 being arranged approximately horizontally so as to be capable of swinging to a limited extent up or down without materially affecting the longitudinal position of the adjacent parts. Bolted to the shaft 50 as indicated at 54, is a heavy upright or standard 55 to which is pivoted or swiveled a nut 56 engaged by the threaded end 57 of an adjusting screw 58 extending diagonally upward to the rear end of the machine at 59 in a guide or holder 60 in position to be engaged by a crank or other turning means for proper adjustment. Pivoted to the link 45 at 61 is a vertical link 62 which is pivoted at 63 to a weight lever 64 carrying a weight 65 at one end, adapted to engage a stop 66 projecting from the frame of the machine, said weight lever 64 being pivoted at 67 to the frame of the machine. Thus it will be seen that simultaneously adjusting the top rolls 3, and 4 up or down by turning the adjusting or hoisting screw 58 one way or the other, simply rocks the elbow levers or bell cranks 41, 42 on their pivots without moving the weight lever in any way. The primary object of this portion of my invention is to maintain the weight lever in fixed position for all adjustments for thickness of timber, *i. e.* for all the hand adjustments as distinguished from the automatic adjustments or yielding of the rolls for inequalities of work.

By providing a construction which permits the rolls to be adjusted without disturbing the weight or the weight lever, much strain and wear and tear on the machine are avoided. Not only is the adjusting screw 58 itself saved from an unnecessary and continuous strain (to which it would be subjected if the weight of the weight lever came upon it continuously), but so likewise are all the rest of the connecting parts. On the other hand, when an inequality is met with in the timber as it passes between the rolls, the entire weight of the weight lever 64 and its weight 65 is brought directly upon the roll or rolls affected, so that, for example, if the roll 3 moves upward because of an inequality in the work, it lifts bodily the elbow levers 41 and their pivots 43, link 62, weight lever 64 and weight 65, all of which are compelled to move vertically and bodily upward by reason of the links 52 swinging on their fixed pivots 53. So likewise if the roll 4 is compelled to move upward by an inequality, the adjacent elbow levers and weight lever are likewise compelled to move bodily vertically upward as they cannot move in any other direction because of the links 52 and their fixed pivots 53. And finally if both rolls 3 and 4 are compelled by the presence of a thick timber to move upward, all the mechanism below is compelled to move bodily upward. The parallel links 45, 48 permit one set of elbow levers to move vertically independently of the other set, the link 52 prevents longitudinal movement of either or both of said elbow levers, and the upright 55, being prevented from swinging because of its engagement with the threaded rod 58, prevents either of the elbow levers 41, 42 from having pivotal or swinging action. In other words, the yielding or automatic movement of the top rolls in response to the passage of work results in simply moving the weight and weight lever vertically so that they transmit their weight uniformly, directly, and the same in all cases to the upper rolls 3, 4. The pivotal point 61 is nearer the pivot 43 than it is to the pivot 44 to compensate for the driving or fighting action of the gears. In explanation of this point, it will be observed that,

inasmuch as the gears 14, 15 move upward at the point of mutual engagement, the gear 14 therefore gives a resulting lifting action on the roll 3, but as the engagement of the gears 14 and 16 is with an opposite direction of motion, the gear 14 therefore gives the roll 4 a resultant downward tendency, and hence to counteract this tendency of the gear 14 to force the roll 4 downward and the roll 3 upward, I place the pivot or fulcrum 61 of the vertical link 62 on the equalizer links 45 nearer to their fulcrum point 43 than to their fulcrum point 44, with the result that the same weight effect is produced on both rolls. In other words, by locating the pivot point 61 on the equalizer link nearer to the ingoing end, so as to give an excess of weight at this point over the weight at the outgoing end, the disturbing effect of the driving gear on the two rolls 3, 4 is counterbalanced and said rolls are equally weighted. As the top rolls 3, 4 swing either together or independently, their top yokes swing about the shaft 13 as a pivot, and because of their heavy solid construction, extending across from one end of the rolls to the other, they give stability against twisting tendency, thereby coöperating with the weighting mechanism in securing evenness and uniformity of vertical movement.

It will be understood that various changes in proportion, arrangement, and combination of parts may be resorted to without departing from the spirit and scope of my invention.

Having described my invention, what I claim as new, and desire by Letters Patent, is:

1. In a planing machine, upper feed rolls, lower feed rolls, means for positively driving said rolls, weighting mechanism for the upper feed rolls including a weight lever and supporting rods pivoted to said rolls at their upper ends and pivotally connected to the weight lever at their lower ends, and hand adjusting means operating on said weighting mechanism for simultaneously moving said rods longitudinally for adjusting said upper rolls for different thicknesses of timber, said weighting mechanism including a weight lever unaffected in position by said adjustment.

2. In a planing machine, vertically movable upper feed rolls, each provided with a driving gear, intermediate driving means engaging one of said gears with an upward lifting tendency and the other of said gears with a downward tendency, thereby tending to lift one roll and push downward on the other roll, and weighting mechanism for said rolls, including transmitting devices for compensating for said lifting and downward tendencies and maintaining a uniform and even pull of the weighting mechanism upon said two rolls.

3. In a planing machine, independently movable upper feed rolls, and weighting mechanism therefor, comprising elbow levers, a suspending connection from each roll to the corresponding arm of the adjacent elbow lever, parallel links spaced apart and pivotally connecting said elbow levers to permit said arms to swing with relation to said links, a weight lever pivoted to a fixed part and pivotally connected to one of said links, and means permitting said elbow levers and links to move vertically while preventing them from moving longitudinally of the machine.

4. In a planing machine, independently movable upper feed rolls, and weighting mechanism therefor, comprising elbow levers, a suspending connection from each roll to the corresponding arm of the adjacent elbow lever, parallel links spaced apart and pivotally connecting said elbow levers to permit them to have similar movement, a weight lever pivoted to a fixed part and pivotally connected to one of said links, and a third link pivotally connected at one end to the aforesaid portion of the weighting mechanism and at its other end pivoted to a fixed part of the machine.

5. In a planing machine, independently movable upper feed rolls, and weighting mechanism therefor, comprising elbow levers, a suspending connection from each roll to the corresponding arm of the adjacent elbow lever, parallel links spaced apart and pivotally connecting said elbow levers to permit them to have similar movement, a weight lever pivoted to a fixed part and pivotally connected to one of said parallel links, a third link pivotally connected at one end to the aforesaid portion of the weighting mechanism and at its other end pivoted to a fixed part of the machine, an adjusting screw, and connections from said screw to rock said elbow levers by the turning of the adjusting screw.

6. In a planing machine, independently movable upper feed rolls, and weighting mechanism therefor, comprising elbow levers, a suspending connection from each roll to the corresponding arm of the adjacent elbow lever, parallel links spaced apart and pivotally connecting said elbow levers to permit them to have similar movement, a weight lever pivoted to a fixed part and pivotally connected to one of said parallel links, a third link pivotally connected at one end to the aforesaid portion of the weighting mechanism and at its other end pivoted to a fixed part of the machine, a laterally projecting member rigidly secured to move

with one of said elbow levers, and an adjusting screw for moving said member and the connected parts.

7. In a planing machine, a feed roll, and its journal box, an upwardly projecting adjusting bolt very nearly vertical but inclined slightly forward at its upper end in said journal box, and a horizontally movable plate beneath said adjusting bolt, said plate having an inclined top surface approximately perpendicular to said inclined adjusting bolt.

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

CHARLES W. H. BLOOD.

Witnesses:
CARL G. OSTERMAN,
GEO. H. MAXWELL.