No. 694,096. Patented Feb. 25, 1902.

M. P. FILLINGHAM.

SAFETY STOP MOTION FOR GRINDING MACHINES.

(Application filed Oct. 24, 1901.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

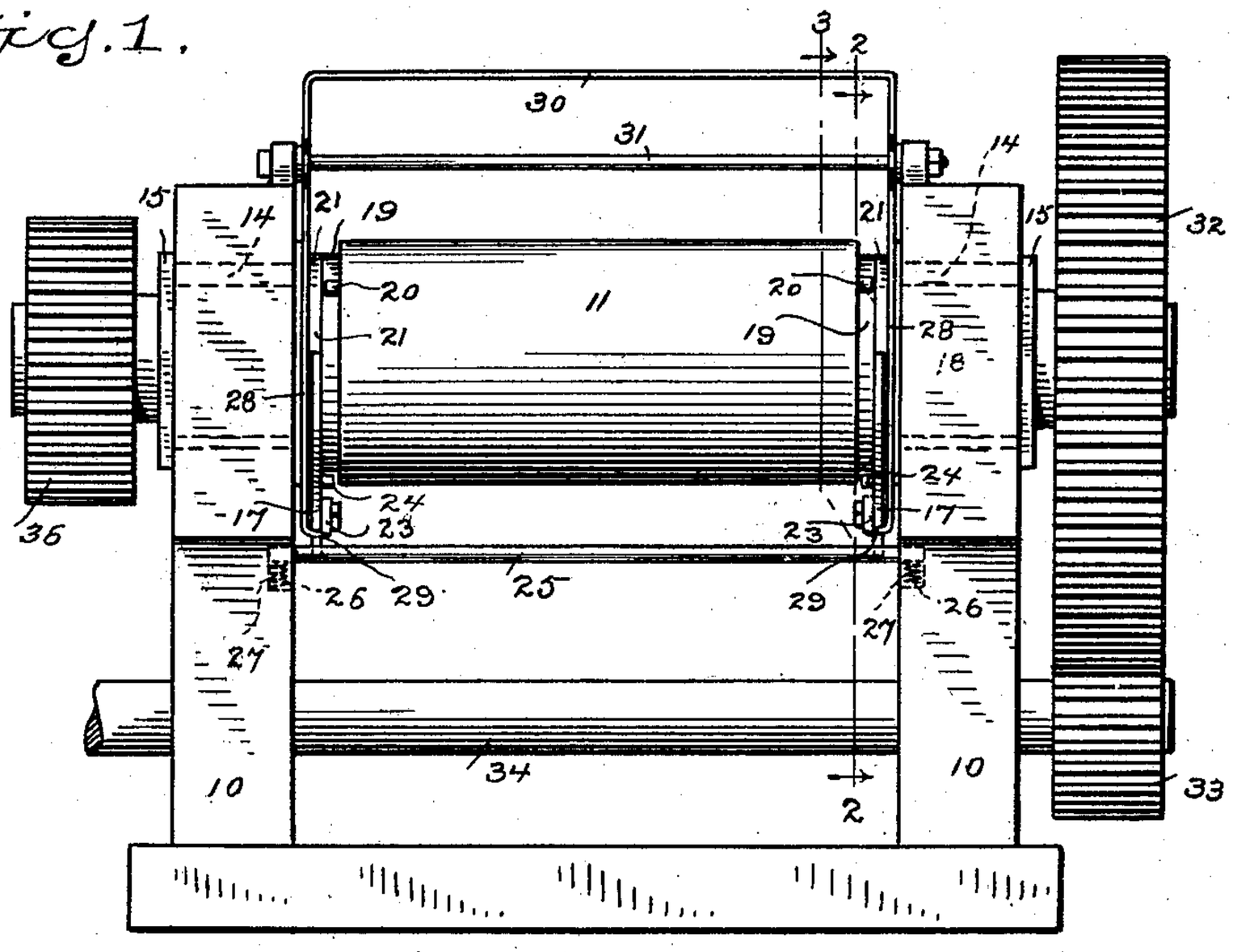
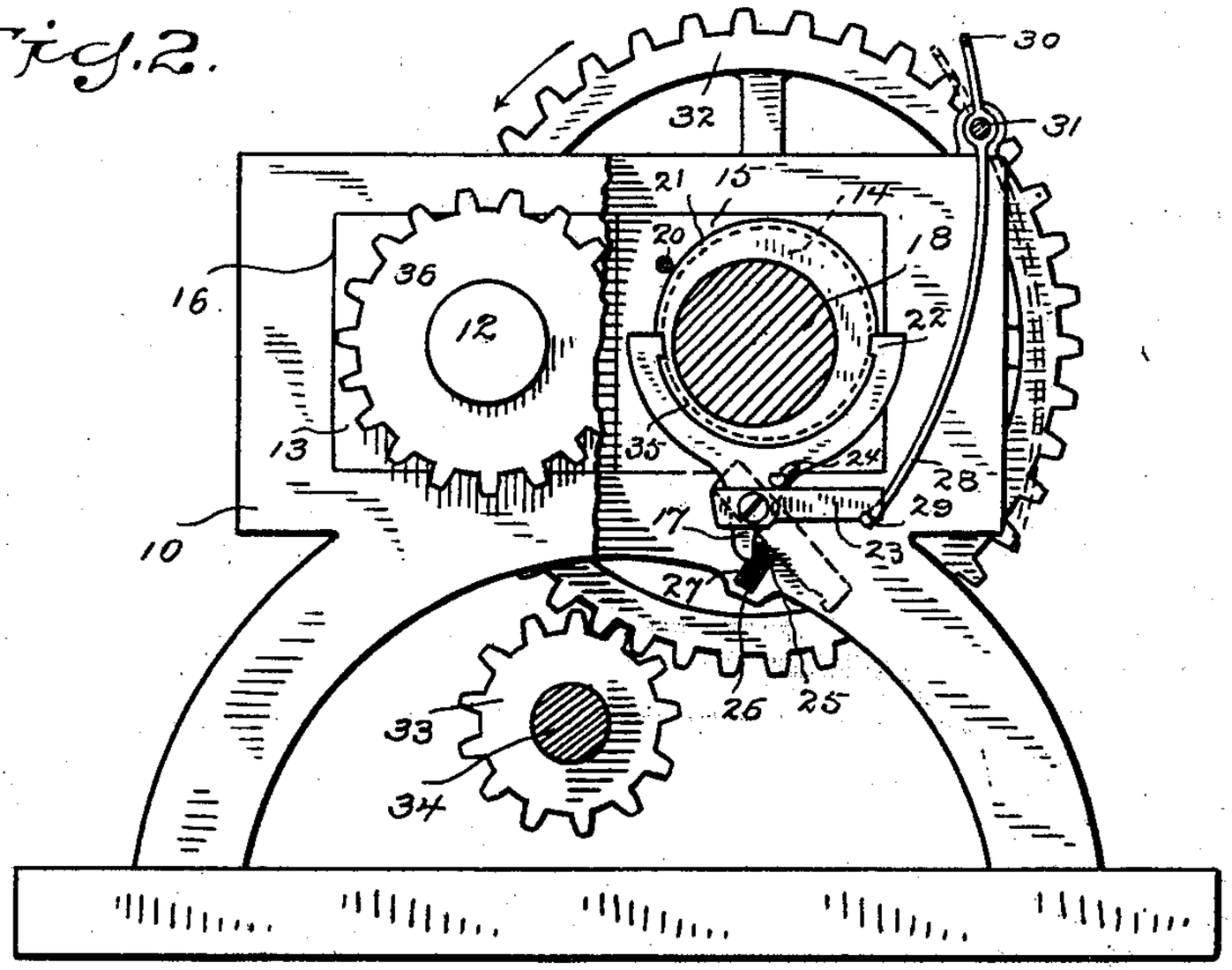


Fig. 2.



WITNESSES.

H. A. Lamb.

S. K. Atherton.

INVENTOR.

Myles P. Fillingham

By A. M. Wooster

Atty

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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Fig. 3.

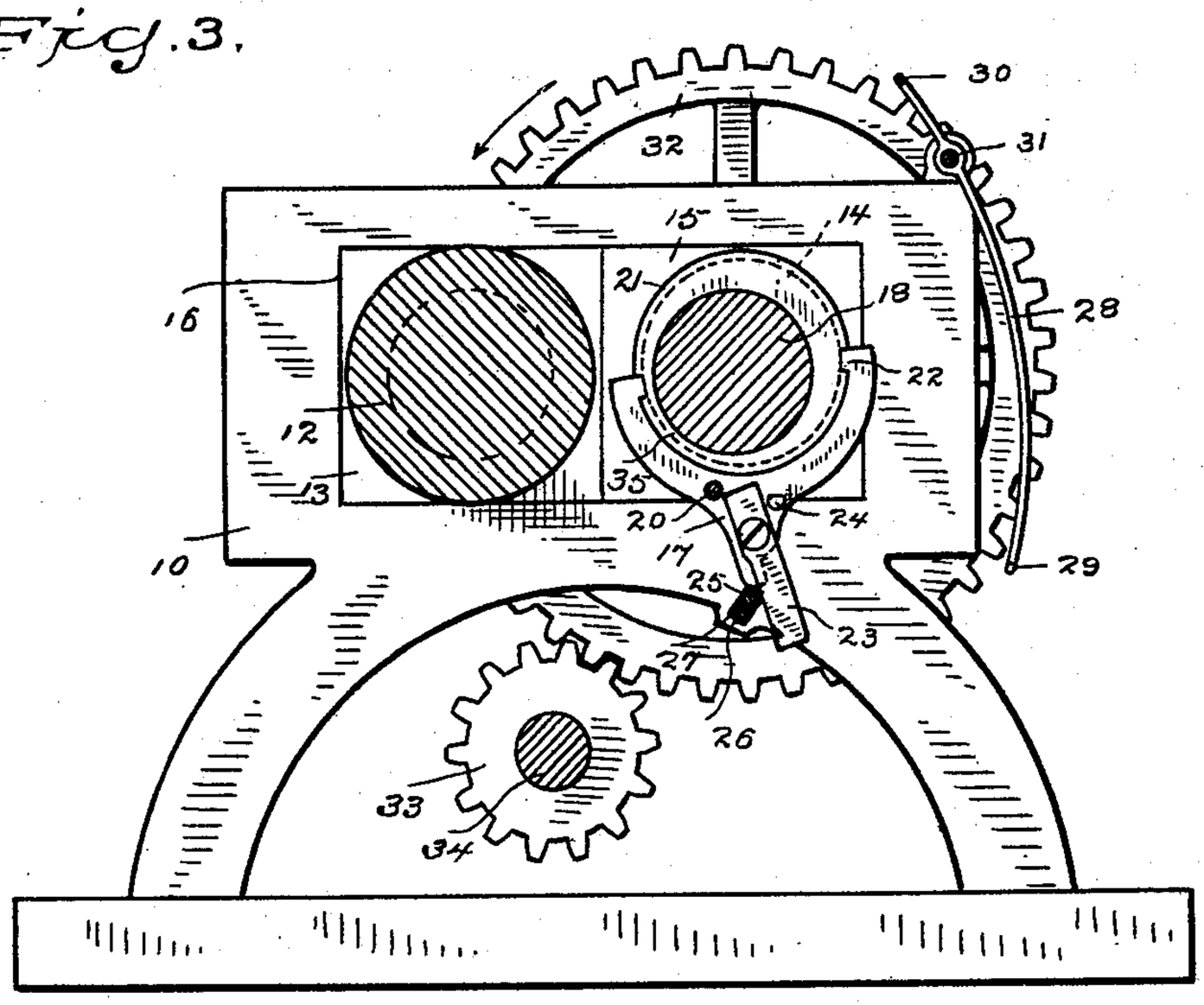
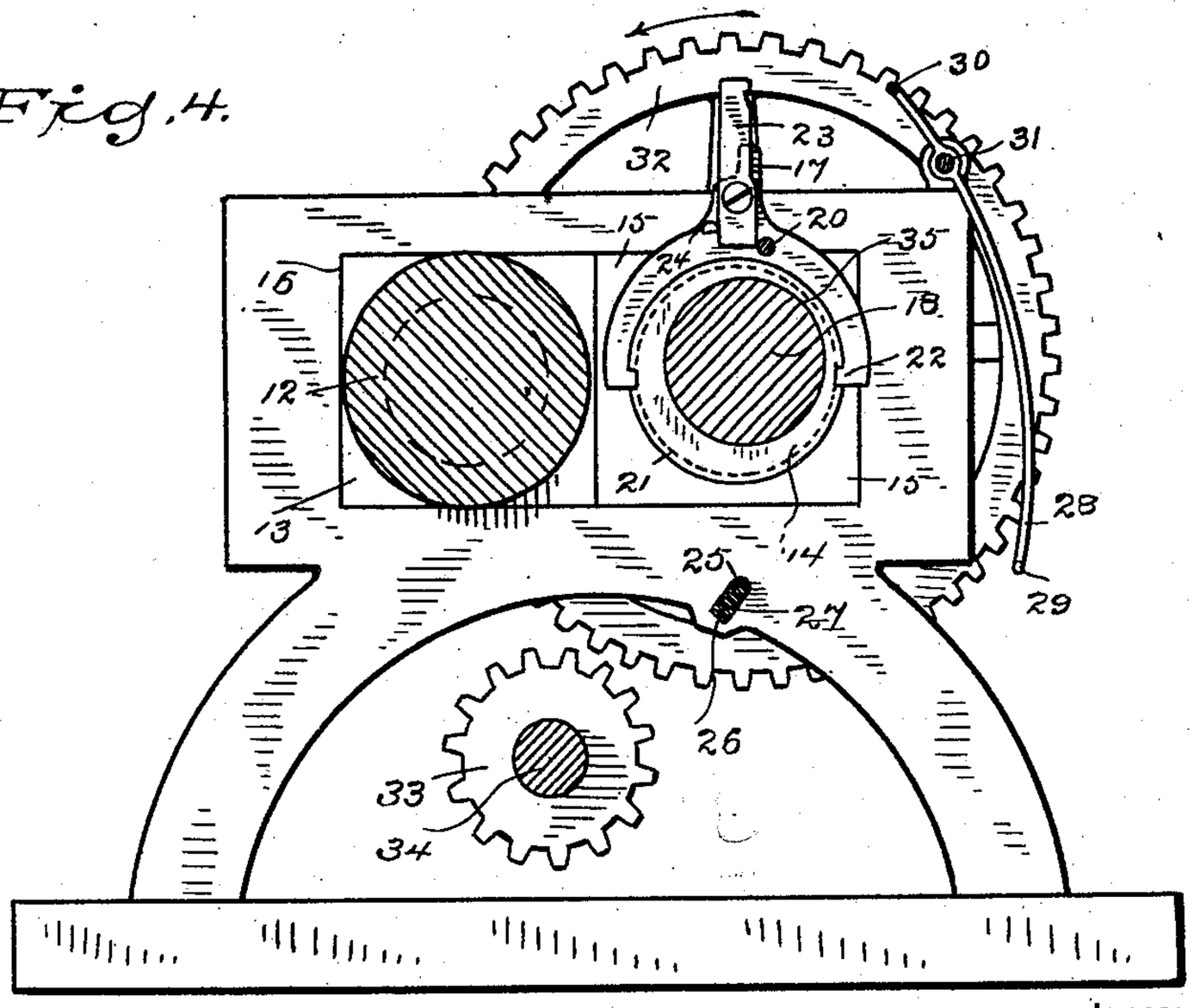


Fig. 4.



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By A. W. Wooster Atty.

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UNITED STATES PATENT OFFICE.

MYLES P. FILLINGHAM, OF ANSONIA, CONNECTICUT.

SAFETY STOP-MOTION FOR GRINDING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 694,096, dated February 25, 1902.

Application filed October 24, 1901. Serial No. 79,800. (No model.)

To all whom it may concern:

Be it known that I, MYLES P. FILLINGHAM, a citizen of the United States, residing at Ansonia, county of New Haven, State of Connecticut, have invented a new and useful Safety Stop-Motion for Grinding-Machines, of which the following is a specification.

My invention relates generally to machines using two heavy rolls between which the hand of an operator is liable to be caught while feeding or tending the machine—as, for example, the invention is admirably adapted for use upon "rubber grinding-machines," so called, although the principle is equally applicable to various other types of machines not necessarily grinders; and my invention has for its object to provide a safety stop-motion applicable generally to two-roll machines.

With this end in view my invention consists in the novel construction and combination of parts, as hereinafter set forth and then specifically pointed out in the claims.

In the accompanying drawings, forming part of this specification, Figure 1 is an elevation of a two-roll grinding-machine, showing the application thereto of my novel stop-motion; Fig. 2, a view showing a portion of the machine in end elevation as seen from the left in Fig. 1, the neck of the front roll as seen in Fig. 1 being in section on the line 2 2 and the parts comprising the stop-motion being in the normal—that is, the inoperative—position, as when the machine is in use, the position of the lever after it is tripped being indicated by dotted lines; Fig. 3, a similar view showing the front roll as seen in Fig. 1 in section on the line 2 2 and the back roll in section on the line 2 3, the rolls having made approximately a quarter-turn from the position shown in Fig. 2 and the rotary movement of the eccentric bearing-sleeves, one only being shown, having commenced; and Fig. 4 is a view similar to Fig. 3, except that the rotary movement of the eccentric bearing-sleeves, one only being shown, has raised the roll and placed the gear-wheel out of engagement with the driving-pinion.

10 denotes the framework, which may be of any ordinary or preferred construction; 11, the front roll, and 12 the back roll.

I have used the terms "front" and "back" for convenience only, my novel stop-motion being applicable to either roll and it being wholly immaterial which is made movable. In the present instance I have shown the stop-motion as applied to the roll which I have termed the "front" roll. The back roll is journaled in boxes 13, and the front roll is journaled in eccentric bearing-sleeves 14, which are rotatable in boxes 15.

By the term "eccentric" as applied to the bearing-sleeves I mean sleeves having an internal circumference eccentric to their external circumference, so that the walls of the sleeves increase in thickness in both directions from their thinnest portion to a point diametrically opposite to the thinnest portion. Boxes 13 and 15 are shown as lying side by side in recesses 16 in the framework. It should be understood, however, that these details of construction are wholly unimportant so far as the principle of the invention is concerned and, furthermore, that both ends of the front roll are journaled in eccentric bearing-sleeves and that both bearing-sleeves are turned together, as will be more fully explained one only of the bearing-sleeves, however, appearing in the drawings.

It is of course not important, so far as my novel stop-motion is concerned, by what special style of gearing the rolls are driven. I have shown one of the necks 18 of the front roll as provided with a gear-wheel 32, which meshes with a pinion 33 on a shaft 34, which may be driven in any suitable manner. The necks at the opposite ends of the rolls from the gear-wheel and the driving-pinion are provided with intermeshing pinions 36, by means of which the back roll is driven from the front roll.

The important feature of my invention is that the rolls may be stopped easily and quickly without stopping the rotation of the driving-shaft and that simultaneously the rolls are separated. This result I accomplish by means of the eccentric bearing-sleeves, to which rotary movement is imparted in the manner I shall presently describe. The necks of the front roll rotate in the usual manner in the eccentric bearing-sleeves, the roll being moved toward or from the back roll by rotation of these sleeves in boxes 15. In the operative position of the rolls the bearing-sleeves lie with the thinnest portions of their walls,

which I have specifically indicated by 35, in direct line with pinion 33, (see Fig. 2,) so that the instant the sleeves commence to rotate constantly-thickening walls will pass between the necks and the boxes in which they are seated at a point in line with the driving-pinion. The eccentricity of the walls of the sleeves is sufficient so that in less than a revolution of the rolls the gear-wheel will be moved upward and outward wholly out of engagement with pinion 33, as clearly shown in Fig. 4, and the rolls will also be separated an equal distance, thus relieving the pressure should a hand be caught between them, the separation of the rolls commencing the instant the eccentric bearing-sleeves commence to turn.

The eccentric bearing-sleeves are provided with arms 17, which lie between the ends of the rolls and the framework and may be made detachable from the sleeves.

18 denotes the necks of the rolls, and 19 shoulders between the necks and the operative portion of the rolls, the shoulders being of less diameter than the operative portions of the rolls.

20 denotes pins, one at each end of the front roll, which extend from the ends of the operative portions of said roll above the shoulders and the purpose of which will presently be explained. In the present instance I have shown the eccentric bearing-sleeves as provided with flanges 21 and have shown arms 17 as made separate from the flanges and attached thereto by lug-and-notch connections, as at 22.

23 denotes levers pivoted to arms 17, and 24 pins on arms 17, which are adapted to be engaged by the short arms of the levers when the stop-motion is operated, as will be more fully explained.

25 denotes a cross-rod extending between the inner sides of the framework, the ends of said cross-rod lying in oblique recesses 26 in the framework. Within recesses 26 are springs 27, which normally hold the cross-rod at the upper ends of the recesses, as in Figs. 2 and 4. Arms 17 lie normally in engagement with the cross-rod, and the eccentric bearing-sleeves are thereby locked in the inoperative position, as shown in Fig. 2. Levers 23 are normally held in approximately a horizontal position, as in Fig. 2, by means of trips 28, which engage the long arms of the levers, the lower ends of the trips being shown as provided with inwardly-extending lugs 29, and the long arms of the levers being provided in their under sides with notches to receive the lugs and hold the levers in such a manner that they may be disengaged from the lugs by slight movement of the trips. The trips are suitably pivoted to the upper portion of the framework, as by means of a cross-rod 31, and extend upward and are connected together above the framework by a cross-rod 30.

The operation is as follows: In Figs. 1 and 2 the parts of the stop-motion are in the normal—*i. e.*, inoperative—position. When the rolls are rotating, pins 20 upon the rolls clear pins 24 upon the arms without engagement. Should the operator in feeding or tending the machine get his hand caught between the rolls or should any other accident happen or should it be desired for any purpose whatever to stop the rotation of the rolls as quickly as possible and without stopping the driving mechanism, the operator or any person by slight movement of the cross-rod connecting the trips may cause the trips to release the long arms of the levers, which will instantly drop by gravity to the position shown in dotted lines in Fig. 2. In Fig. 3 the pins 20 are shown as having engaged the levers and pressed the short arms of the levers against the pins 24 upon the arms, oscillating the arms, so that continued movement of the rolls has caused the long arms of the levers to press cross-rod 25 backward against the power of springs 27 and allowed the ends of arms 17 to pass said cross-rod. The instant the arms pass the cross-rod the front roll will commence to carry the eccentric bearing-sleeves through the engagement of pins 20 upon the roll with the levers, which are themselves now locked between pins 20 and pins 24 upon the arms, as will be readily understood from Fig. 4. As the necks of the front roll are journaled in these eccentric bearing-sleeves and the normal or inoperative position of the parts is with the thinnest portion of the walls of the sleeves in direct line with the driving-pinion, it follows that rotation of the sleeves must carry the front roll outward and upward away from the back roll, which movement will continue until the gear-wheel upon the front roll is placed wholly out of engagement with the driving-pinion and the pinion at the opposite end of the front roll is placed out of engagement with the pinion upon the back roll, so that rotation of both rolls will stop instantly, leaving the front roll separated appreciably more than the normal distance from the back roll, such a position of the parts being clearly indicated in Fig. 4. In starting the rolls again after they have been stopped through the operation of the stop-motion shaft 34 is preferably stopped and arms 17, and with them the eccentric bearing-sleeves, are either moved forward or backward to the position shown in Figs. 1 and 2, the effect of which is to restore the front roll to its operative position, as in Fig. 2, arms 17 being now locked against forward movement by engagement with cross-rod 25. As soon as the parts are placed in this position and the long arms of the levers placed in engagement with the trips power may again be applied to the driving-shaft. I have shown the rear faces of arms 17 as rounded, so that the cross-rod may be pressed downward against the power of the springs by the arms themselves if the latter are moved backward to place. It will be obvious that when returned to the normal position the eccentric bearing-sleeves must

remain locked until again released by movement of the cross-rod in the manner described.

Having thus described my invention, I claim—

1. In a machine of the character described the combination with rolls, of eccentric bearing-sleeves in which one of said rolls is journaled and means for imparting the rotary movement of the roll to said sleeves, whereby said roll may be moved outward and upward away from the other roll.

2. In a machine of the character described the combination with rolls and driving connections therefor, of pins 20 extending from the ends of one of the rolls, eccentric bearing-sleeves in which said roll is journaled, arms extending from the bearing-sleeves and having pins 24, levers pivoted to the arms, a spring-controlled cross-rod engaged by said arms to lock the bearing-sleeves, and trips for holding the levers out of engagement with the cross-rod, the parts being so arranged that pins 20 will clear pins 24 and when the levers are released pins 20 and 24 will lock the levers and cause them to retract the cross-rod and release the arms, continued movement of the rolls carrying the eccentric bearing-sleeves and lifting the roll carried thereby upward and outward and detaching the driving connections.

3. In a machine of the character described the combination with rolls, of eccentric bearing-sleeves in which one of said rolls is journaled, arms extending from said sleeves, a spring-controlled cross-rod which is engaged by the arms to lock the sleeves and means at the control of the operator whereby movement of the roll is caused to release the arms, and rotate the eccentric bearing-sleeves, which lift the roll journaled therein outward and upward away from the other roll.

4. In a machine of the character described the combination with rolls and driving connections therefor, of eccentric bearing-sleeves in which one of said rolls is journaled, arms extending from said sleeves, a spring-controlled cross-rod which is engaged by the arms to lock the sleeves and means at the control of the operator whereby movement of the rolls is caused to retract the cross-rod, which releases the arms, and rotate the eccentric bearing-sleeves which lift the roll outward and upward and detach the driving connections.

5. In a machine of the character described the combination with rolls, of eccentric bearing-sleeves in which one of said rolls is journaled, said sleeves having flanges 21, arms detachably connected to said flanges, a spring-controlled cross-rod engaged by the arms to lock the sleeves and means at the control of the operator whereby movement of the roll is caused to release the arms and rotate the sleeves, substantially as and for the purpose set forth.

6. In a machine of the character described the combination with rolls, of eccentric bearing-sleeves in which one of said rolls is journaled, means for normally locking said sleeves against rotation and means whereby the movement of the rolls is caused to release and rotate the sleeves.

7. In a machine of the character described the combination with rolls, of eccentric bearing-sleeves in which one of said rolls is journaled, arms extending from said sleeves, means whereby the arms are locked and means whereby said arms are released and the rolls and sleeves are connected.

8. In a machine of the character described the combination with framework having recesses 26, rolls and eccentric bearing-sleeves in which one of said rolls is journaled, of arms extending from said sleeves, a cross-rod extending between the recesses, springs in said recesses which hold the cross-rod in position to be engaged by the arms and means for retracting the cross-rod against the power of the springs and for connecting the rolls and the sleeves.

9. In a machine of the character described the combination with rolls, one of which is provided with pins extending from the ends thereof and eccentric bearing-sleeves in which said roll is journaled, of arms extending from said bearing-sleeves and also provided with pins, levers pivoted to the arms, means for locking the bearing-sleeves and means for normally holding the levers out of operative position.

10. In a machine of the character described the combination with rolls, one of which is provided with pins extending from the ends thereof, and eccentric bearing-sleeves in which said roll is journaled, of arms extending from said bearing-sleeves and also provided with pins, levers pivoted to the arms, means for locking the bearing-sleeves and pivoted trips acting to normally hold the levers out of operative position and provided with a cross-rod in position to be engaged by the operator.

11. In a machine of the character described the combination with rolls, one of which is provided with a gear-wheel, of a driving-pinion adapted to engage the gear-wheel, eccentric bearing-sleeves in which the roll carrying the gear-wheel is journaled and means for connecting the roll and the bearing-sleeves whereby the roll journaled therein is lifted and the gear-wheel is disengaged from the driving-pinion.

12. In a machine of the character described the combination with rolls, one of which is provided with a gear-wheel, of a driving-pinion adapted to engage the gear-wheel, eccentric bearing-sleeves in which the roll carrying the gear-wheel is journaled and means at the control of the operator whereby the roll and the bearing-sleeves are connected.

13. In a machine of the character described the combination with rolls, one of which is provided with a gear-wheel and which are

provided at their opposite ends with intermeshing pinions, of a driving-pinion adapted to engage the gear-wheel, eccentric bearing-sleeves in which the roll carrying the gear-wheel is journaled, means for normally locking the sleeves and means at the control of the operator whereby movement of the rolls will unlock the sleeves and connect the roll and the sleeves, whose forward movement will disconnect the gear-wheel from the driving-pinion and also disconnect the pinions at the other ends of the rolls.

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

MYLES P. FILLINGHAM.

Witnesses:

ALFRED BARNETT,

DAVID R. BOWEN.