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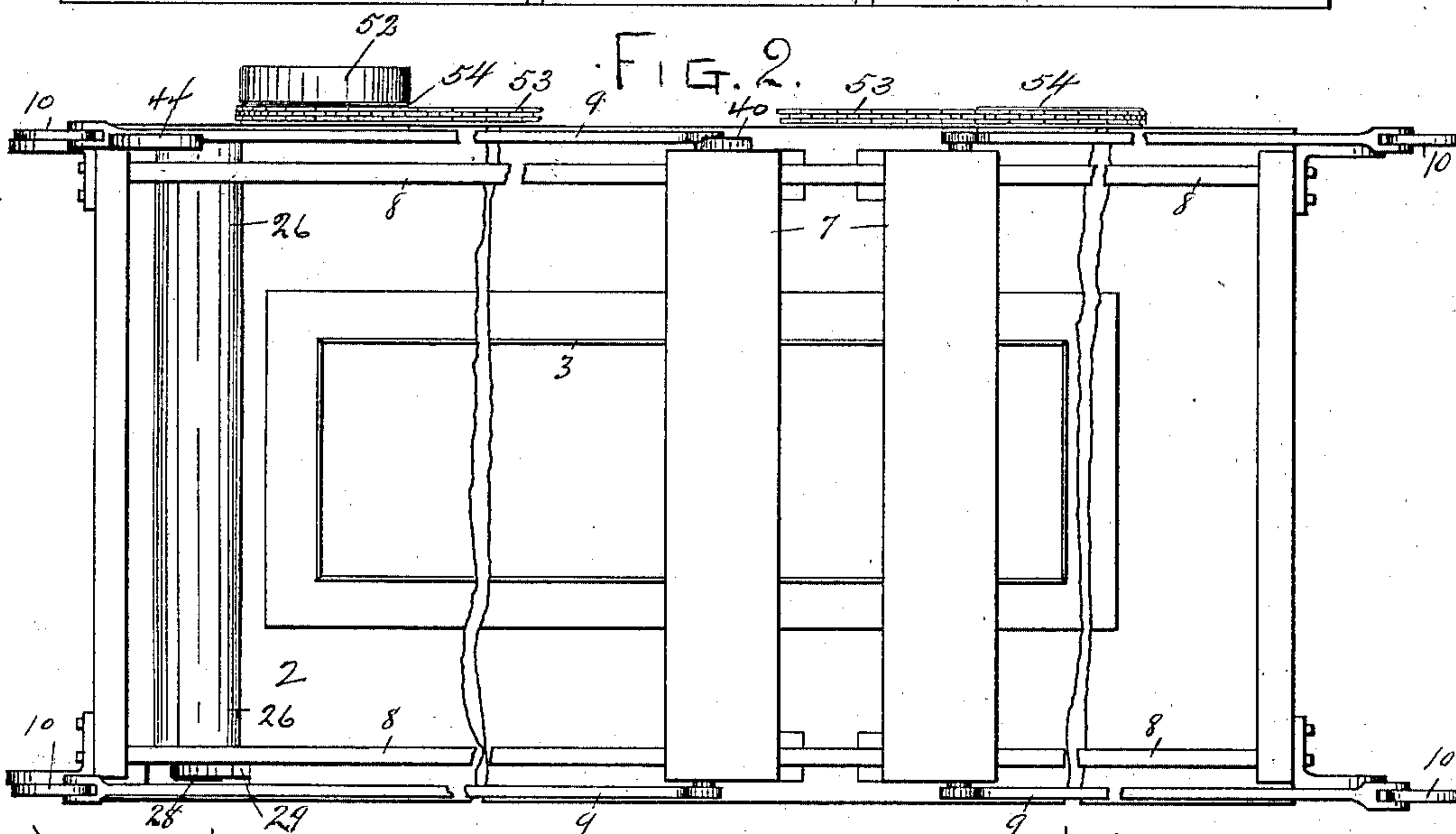
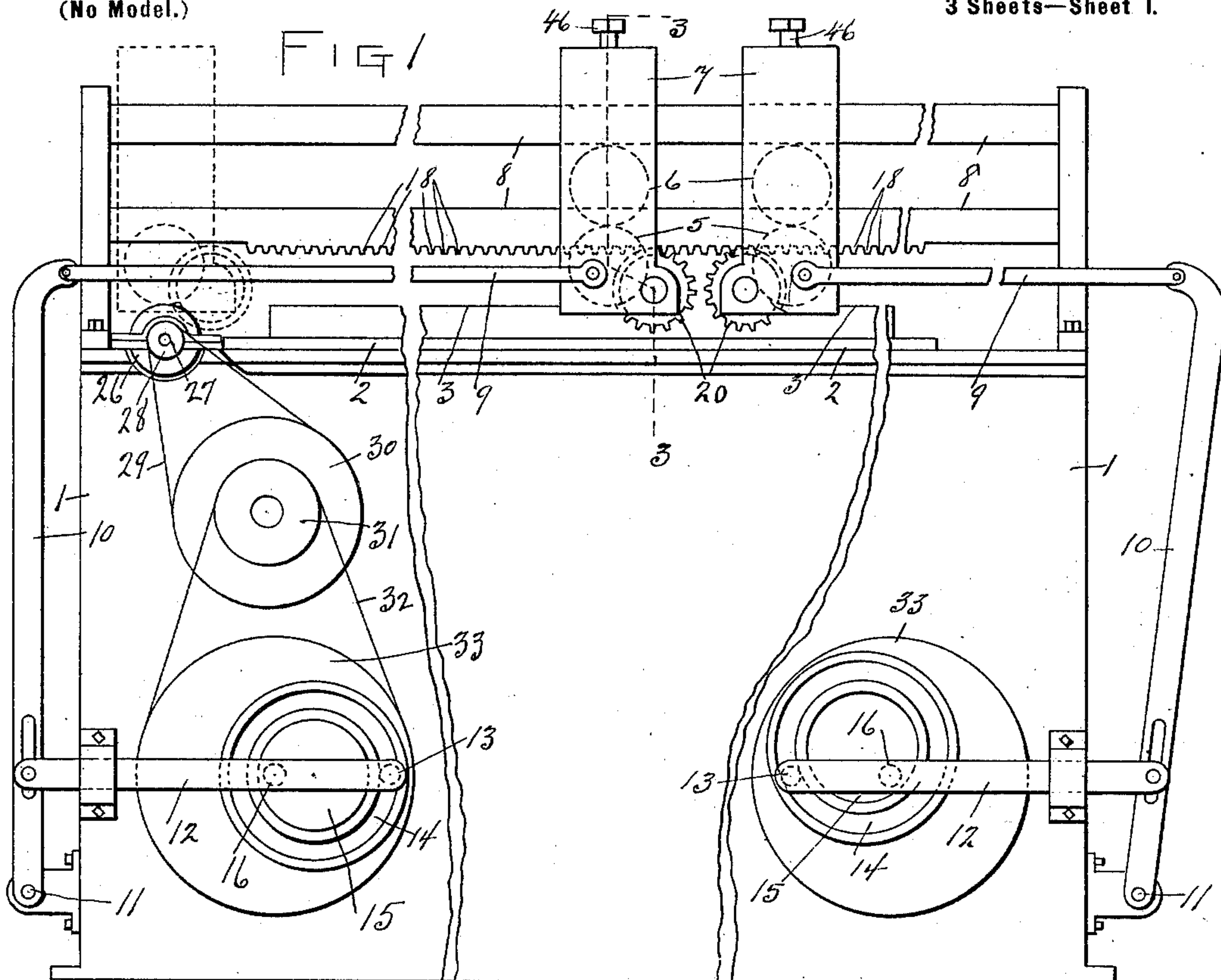
Patented Dec. 23, 1902.

T. D. ROBINSON & R. D. VIELE.  
CUTTING MACHINE.

(Application filed Apr. 5, 1902.)

(No Model.)

3 Sheets—Sheet 1.



WITNESSES

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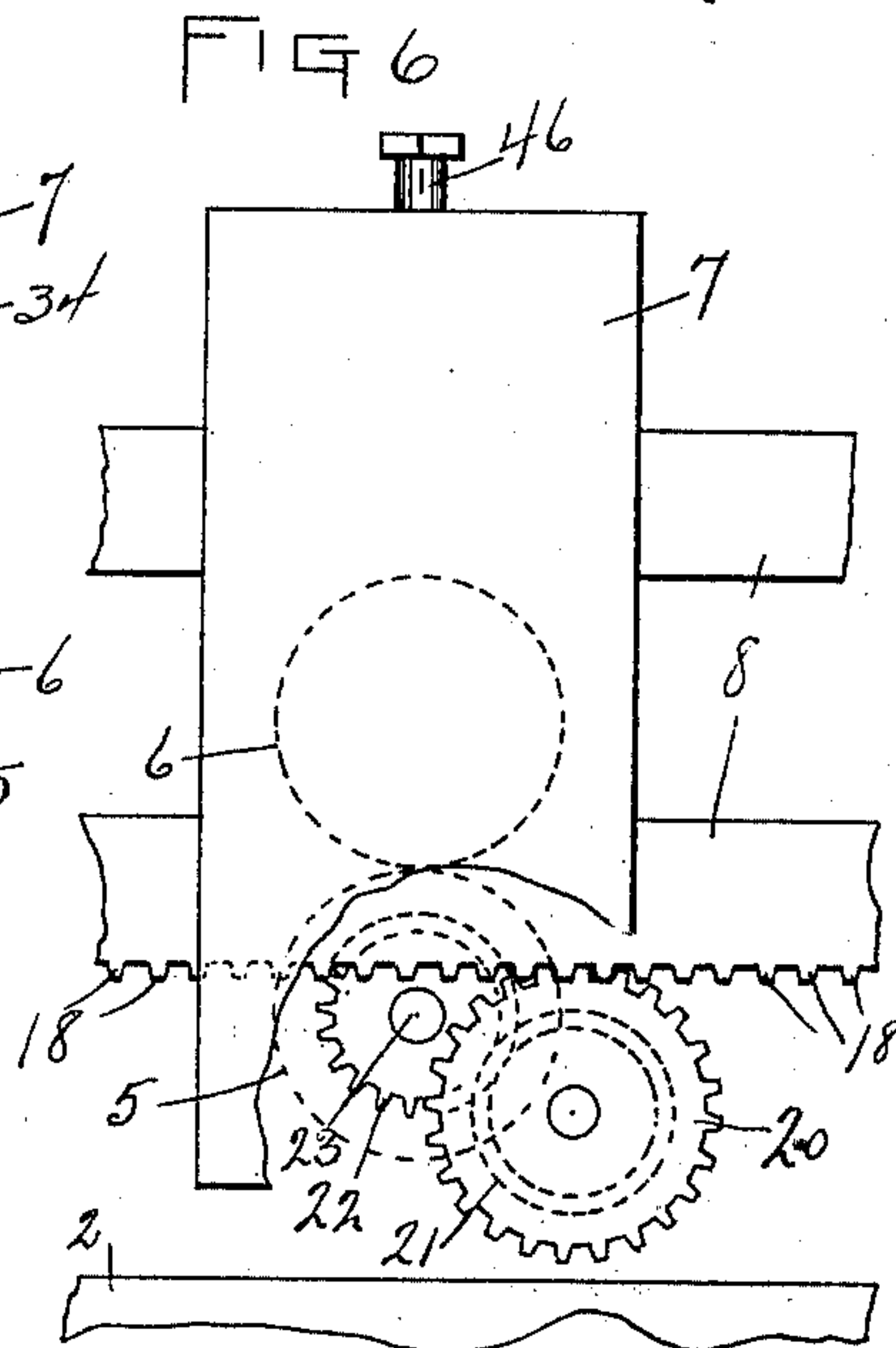
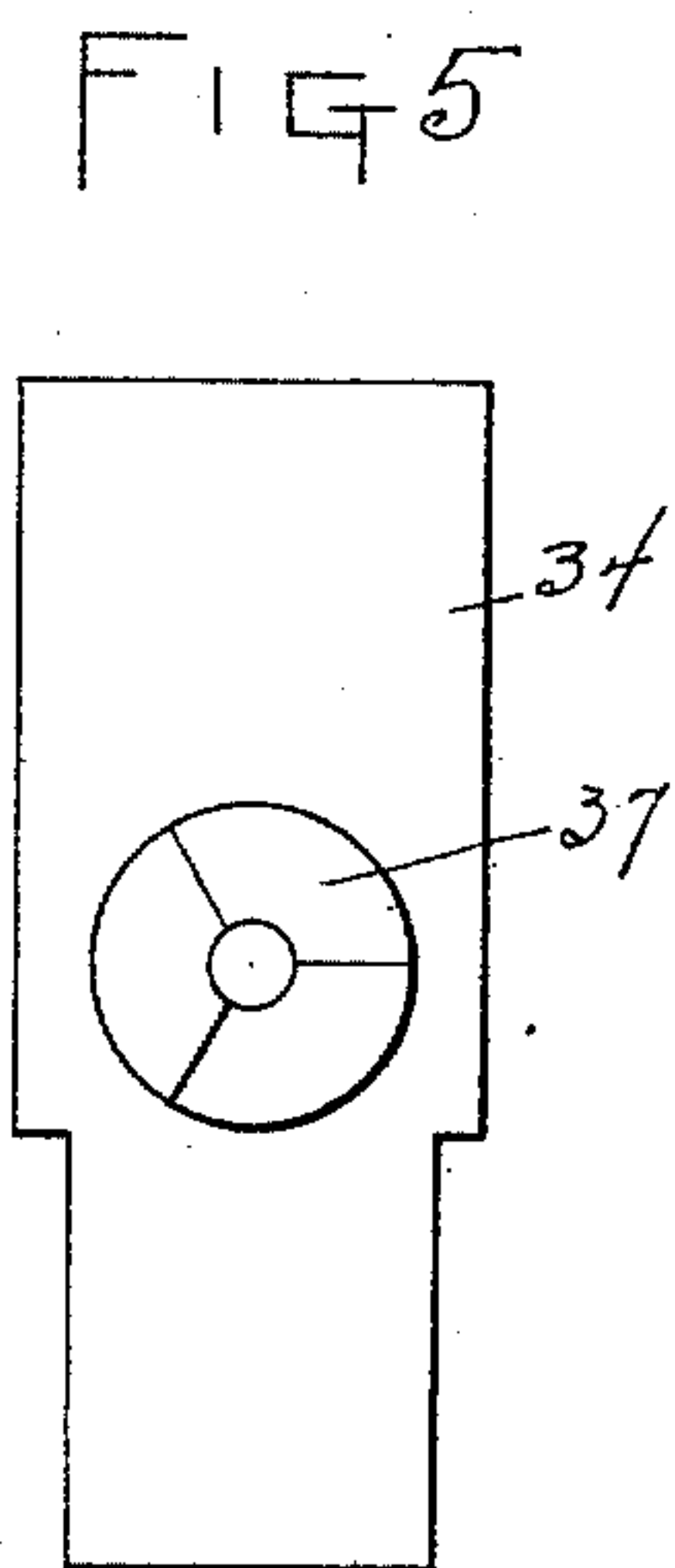
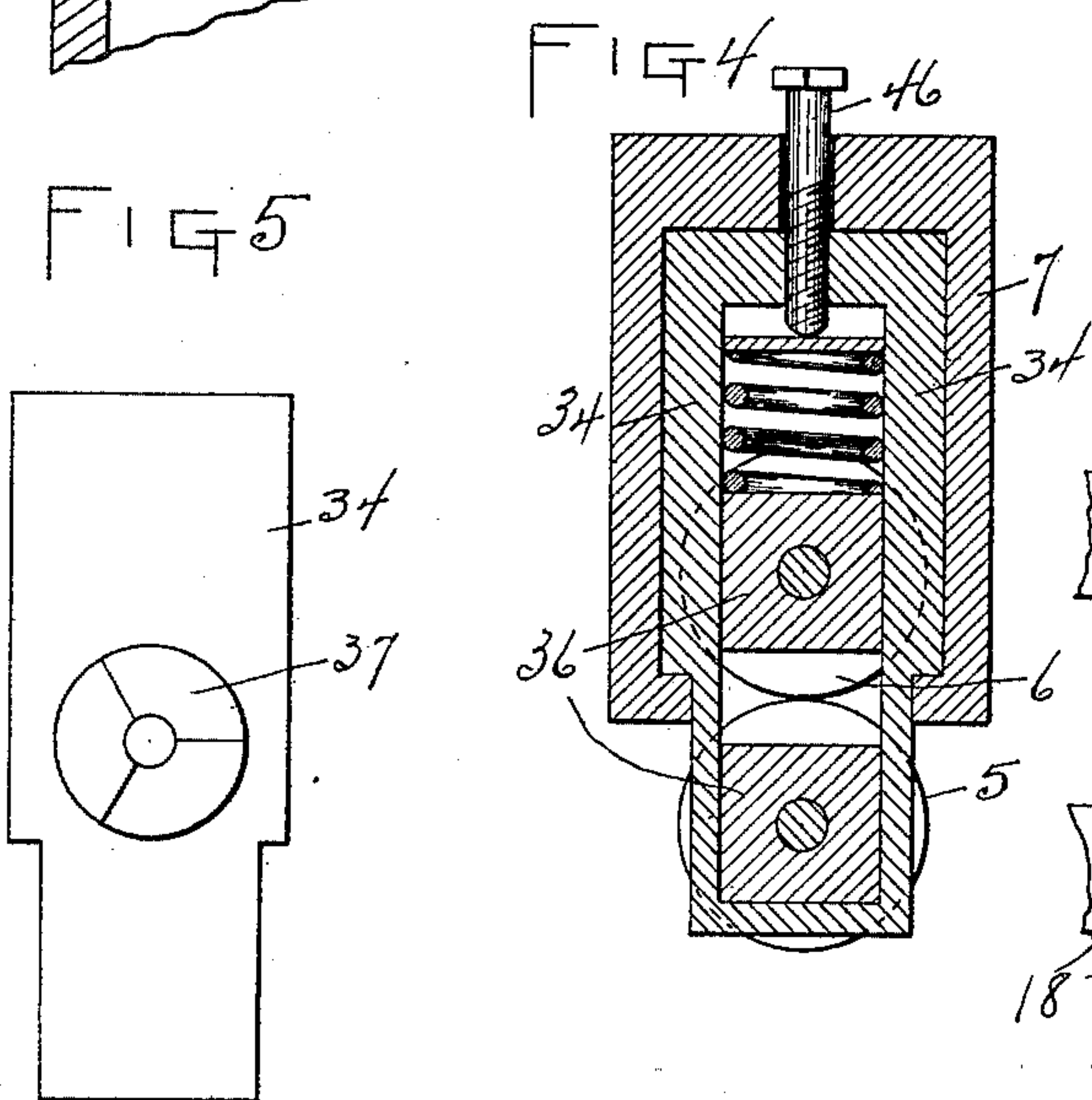
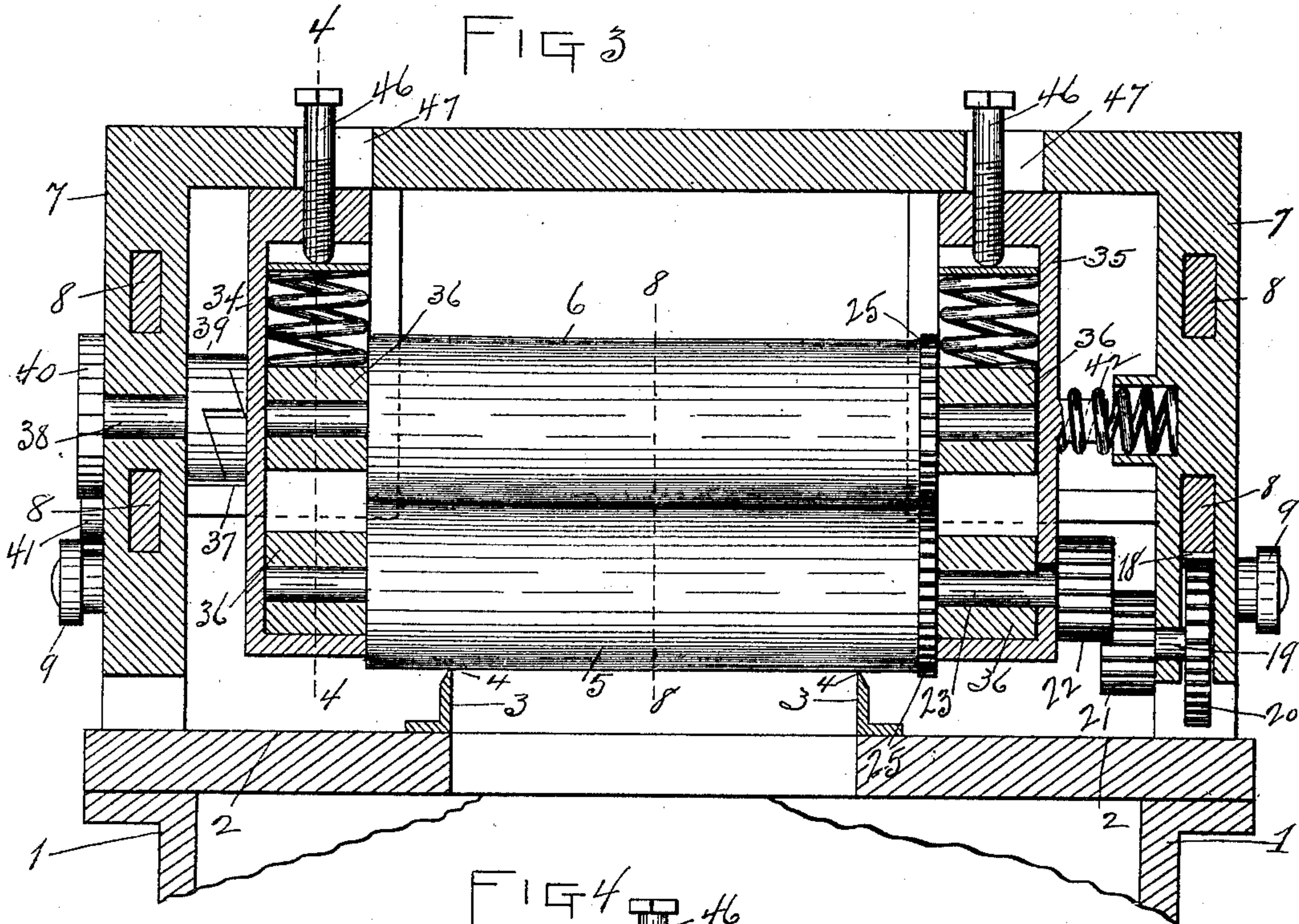
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3 Sheets—Sheet 2.



WITNESSES

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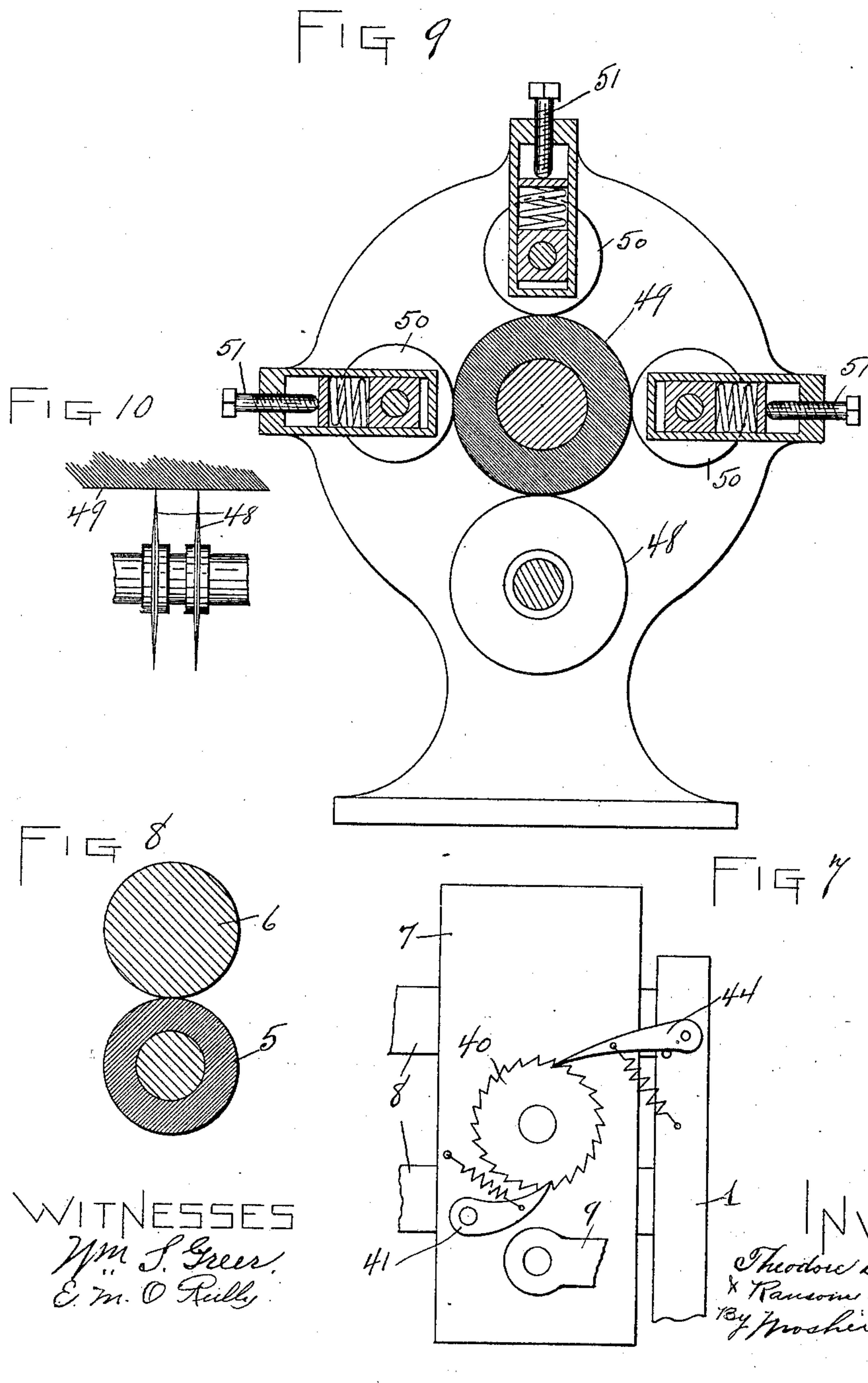
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3 Sheets—Sheet 3.





# UNITED STATES PATENT OFFICE.

THEODORE D. ROBINSON, OF ALBANY, AND RANSOM D. VIELE, OF TROY,  
NEW YORK.

## CUTTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 716,479, dated December 23, 1902.

Application filed April 5, 1902. Serial No. 101,467. (No model.)

*To all whom it may concern:*

Be it known that we, THEODORE D. ROBINSON, residing at Albany, county of Albany, and RANSOM D. VIELE, residing at Troy, county of Rensselaer, State of New York, citizens of the United States, have invented certain new and useful Improvements in Cutting-Machines, of which the following is a specification.

10 The invention relates to such improvements; and it consists of the novel construction and combination of parts hereinafter described and subsequently claimed.

Reference may be had to the accompanying 15 drawings, and the reference characters marked thereon, which form a part of this specification.

Similar characters refer to similar parts in the several figures.

20 Figure 1 of the drawings is a view in side elevation of our improved cutting-machine, partly broken away. Fig. 2 is a top plan view of the same. Fig. 3 is a vertical cross-section of the same, taken on the broken line 3 3 in Fig. 1. Fig. 4 is a vertical cross-section of 25 the carriage and the housing for the roller-bearings. Fig. 5 is an end elevation of the cam-engaging housing. Fig. 6 is a view in side elevation of the carriage and its supporting-ways, on an enlarged scale, viewed as seen in Fig. 1. Fig. 7 is a view of the same as seen from the opposite side of the machine. Fig. 8 30 is a vertical cross-section of the die-engaging roller and swaging-roller, taken on the broken line 8 8 in Fig. 2. Fig. 9 is a view showing our invention applied to a rotary edged cutter. Fig. 10 is a view showing a part of said rotary cutter in elevation.

40 The object of our invention is to provide simple and efficient mechanism for cutting sheet material, such as cloth, paper, &c.

45 The invention is applicable to machines adapted for cutting various kinds of sheet material and is particularly adapted for cutting woven fabric into strips, patterns, or blanks for use in the manufacture of shirts, collars, and cuffs.

Referring to the drawings, 1 represents the frame of the machine, having the bed 2, upon 50 which is supported a cutting-die 3, having its cutting edge 4 presented upwardly, which die

may be of any known form. The pressure-roller 5 is supported above said die and is adapted to be moved back and forth to traverse the cutting edge thereof and to force 55 against said cutting edge fabric or other sheet material interposed between said die and roller, causing the fabric to be severed along the lines of said cutting edge of the die, whereby a blank is cut from the fabric corresponding 60 in form and size with the die-aperture. The material to be cut may be placed, in the form of sheets or strips, between the die and roller by hand or in any known manner and may consist of one or more plies or thick- 65 nesses. The roller 5 is preferably provided with a highly-malleable metal surface capable of yielding to the pressure of the cutting edge of the die as such edge is caused by the pressure of the roller to sever the fibers of the 70 interposed fabric. This malleable surface may be obtained by making the outer portion of the roller of Babbitt metal or other comparatively soft and malleable metal or alloy. As the roller traverses the die its surface will 75 thus become indented along its lines of engagement with the cutting edge of the die. For the purpose of erasing the indentations so formed and restoring the surface of the roller to its normal approximately smooth 80 condition we provide a swaging-roller 6, engageable with the malleable surface of the die-engaging roller as said rollers are rotated in contact with each other adapted to swage or work into shape the indented portions of such 85 surface between their successive engagements with such cutting edge of the die.

The two rollers 5 and 6 are rotatively mounted in a frame or carriage 7, mounted upon 90 tracks or ways 8, erected from the frame of the machine on opposite sides thereof. The carriage is adapted to travel back and forth along said ways and may be operated thereupon in any known manner. We have shown the opposite ends of the carriage connected 95 by links 9, respectively, with levers 10, fulcrumed at 11 upon the frame of the machine, and each connected on its side of the machine by a sliding arm 12 with a cam-follower 13, adapted to travel in the cam-raceway 14 in 100 the cam-disk 15, fixed upon the shaft 16, to which power may be applied in any known



manner, as by the belt-pulley 52. Rotary movements imparted to the shaft 16 and cam-disk 15 cause the arm 12 to be reciprocated, thereby vibrating the levers 10 and imparting to the carriage through the links 9 back and forth movements along the ways 8, thereby causing the roller 5 to traverse the die 3. During such back and forth movements of translation we prefer to positively rotate said rollers while the roller 5 is in engagement with the die and consider it desirable that the rotary movement of the roller 5 should correspond in direction and speed with its movement of translation. To secure such positive rotary movement, we have provided one of the ways 8 with a toothed rack 18 and the carriage 7 with a spindle 19, rotatively mounted thereupon and having fixed upon its opposite ends the gear 20, engageable with said rack, and the gear 21, engageable with a like gear 22, fixed upon the journal 23 of the roller 5. The gears 21 and 22 are equal in size, and the gear 20 is of the same diameter as the roller 5, whereby as the gear 20 is caused by the movement of the carriage to travel along the rack 18 the roller 5 will be positively driven with a rotary movement corresponding in direction and speed with its movement of translation and the movement of the carriage along the ways 8—that is, precisely the same rotary movement of the roller 5 is secured as if said roller were rotated by frictional contact with the die 3 without slip; but such rotary movement is accomplished without pulling upon or displacing the fabric on the die. Interengaging gears 25 on the rollers 5 and 6, respectively, cause such positive rotary movements to be imparted to the swaging-roller. We have shown the toothed rack 18 extended along only a part of the path traversed by the carriage, so that as the carriage nears the end of the movement toward the left, as shown in Fig. 1, the gear 20 will pass out from engagement with said rack, leaving the rollers 5 and 6 free to respond to any rotary movement which may be imparted to them. Just beyond the end of said rack 18 is placed a swaging-roller 26, fixed upon the shaft 27, adapted to be rotated at a high rate of speed by means of the pulley 28, belt 29, and pulley 30, which may be driven in any known manner, as by the pulley 31, fixed to the pulley 30, belt 32, and pulley 33, fixed upon the power-shaft 16, the pulleys 30 and 33 being relatively large and the pulleys 28 and 31 relatively small. The swaging-roller 26 is located in the path of the roller 5 approximately at the end of its movement of translation to the left, as shown in Fig. 1, and said roller 5 is adapted to engage and be rapidly rotated by said swaging-roller 26 after being released from the control of the gear-rack 18. The roller 5 is thus maintained in engagement with the swaging-roller 26 during a brief interval while the dead-point of the cam 15 is being passed, during which interval the malleable surface of the roller 5

is swaged or re-formed, erasing the indentations formed by the cutting edge of the die.

In order to distribute the wear upon the surface of the roller 5 and to secure the more effective swaging and re-forming of such surface, we provide means for shifting the roller 5 endwise from time to time in order to bring different portions of its surface into line with the cutting edges of the die. Such means comprise, preferably, housings 34 35 for the bearing-boxes 36 for the respective roller-journals, which housings are shiftably mounted upon and capable of a shifting slide movement upon the carriage longitudinally of the rollers. The housing 34 at one end of the rollers is provided with a stationary cam-block 37, and rotatively mounted in the frame of the carriage in line with said cam-block is a spindle 38, having fixed upon its inner end a cam-block 39, adapted to rotate therewith in engagement with the cam-block 37, fixed upon the housing. On the outer end of this spindle 38 is fixed a ratchet-wheel 40, engaged by a dog 41. Interposed between the other housing 35 and the frame of the carriage is a coil-spring 42, which tends to yieldingly force the housings and the rollers in the direction of the rotary cam-block 39, causing the cam-surfaces on the cam-blocks 39 and 37 to be held in engagement with each other. The cam-surfaces on these blocks are in the form of teeth gradually beveled on one side and having an abrupt descent from the highest to the lowest point of the cam, so that as the ratchet-wheel 40 is gradually rotated the position of the rollers will be gradually shifted endwise until the highest points of the cams 37 and 39 pass each other, whereupon the spring 42 will cause an immediate return movement of the rollers to their initial position. Step-by-step rotary movements are imparted to the ratchet-wheel by means of the pawl 44, fixed upon the frame of the machine in the path traversed by said ratchet-wheel near the end of the movement of the carriage to the left, as seen in Fig. 1. It will thus be seen that each time the roller 5 is moved back and forth over the die the engagement of the pawl 44 with the ratchet 40 will cause a slight shifting movement of the roller, so that at the next operation the die will engage a different portion of the roller-surface. The use of such shifting mechanism in connection with the swaging mechanism renders it comparatively easy to maintain the malleable surface of the roller in proper condition to successively coöperate with the cutting-die.

The pressure of the swaging-roller 6 upon the roller 5 can be varied by means of the screw-bolts 46, which pass through slots 47 in the carriage, wherein they are free to move in accordance with the movements of the respective housings.

In Figs. 9 and 10 we have shown our invention applied to a machine employing rotary edge cutters 48 and a coöperative roller



49, having a highly-malleable surface, which is engaged by a plurality of swaging-rollers 50, forced against said surface with pressure regulated by means of the screw-bolts 51.

5 Rotary movements may be imparted to the rotary cutter and several rollers in any known manner.

In applying our invention to a stationary edged cutter any desired number of cutter-engaging rollers may be employed, with means for operating the same.

We have shown in Fig. 1 two traveling carriages 7, both adapted to travel upon the tracks or ways 8, one of said carriages with its 15 contained rollers and its operating mechanism being a counterpart of the other. The throw of the cams 15 is such that each of said carriages is moved over more than one-half of the cutting-die, the paths of the two carriages overlapping each other; but the cams are so arranged upon their respective shafts 16 that the movements of the carriages accord with each other. The shafts 16 may be connected together to rotate in unison in any 20 known manner, as by the chain 53 and sprocket-wheels 54. Any known means may be employed for moving a plurality of die-engaging rollers successively over portions of the cutting edge in the same direction or in 25 different directions.

What we claim as new, and desire to secure by Letters Patent, is—

1. In a cutting-machine, the combination with an edged cutter; a roller coöperative therewith; bearings for said rollers; means 35 for positively imparting to said bearings movements of translation whereby said roller is caused to traverse said edged cutter; and means for positively rotating said roller while traversing said edged cutter, substantially as described.

2. In a cutting-machine, the combination with an edged cutter; a roller coöperative therewith; bearings for said rollers; means 45 for positively imparting to said bearings movements of translation whereby said roller is caused to traverse said edged cutter; and means for imparting to said roller while traversing said edged cutter a rotary movement 50 corresponding in direction and peripheral speed with said movement of translation, substantially as described.

3. In a cutting-machine the combination with an edged cutter; of a coöperative roller 55 having a highly-malleable metal surface; and a plurality of swaging-rollers engageable respectively with said malleable roller-surface.

4. In a cutting-machine, the combination with a stationary cutting-die; and a coöperative roller having a highly-malleable surface; of means for causing said roller to traverse said die; and swaging mechanism engageable with said roller-surface. 60

5. In a cutting-machine, the combination with a pair of coöperative members comprising an edged cutter and a roller; of means 65 for shifting at certain times one of said members relatively to the other in a direction parallel with the axis of said roller.

6. In a cutting-machine, the combination 70 with a cutting-die; and a roller coöperative therewith; of means for moving the roller over the cutting edge of the die; and means for shifting the roller endwise at certain times. 75

7. In a cutting-machine, the combination with a cutting-die; and a roller coöperative therewith; of a movable frame; bearings for said roller shiftably mounted on said frame; means for moving said frame to cause the 80 roller to traverse the die; and means for shifting the roller-bearings endwise at certain times.

8. In a cutting-machine, the combination with an edged cutter; and a swaging-roller; 85 of a roller adapted to engage alternately said edged cutter and swaging-roller.

9. In a cutting-machine, the combination with an edged cutter; a swaging-roller; and means for imparting to the swaging-roller 90 continuous high-speed rotary movements; of a roller coöperative with said edged cutter; and means for moving said coöperative roller into engagement with said cutter and swaging-roller alternately. 95

10. In a cutting-machine, the combination with an edged cutter; and a coöperative roller having a highly-malleable surface; of swaging mechanism engageable with said roller-surface; and means for shifting the 100 roller endwise at certain times.

11. In a cutting-machine, the combination with an edged cutter; a coöperative roller having a highly-malleable surface; and means 105 for shifting said roller endwise at certain times; of a swaging-roller engageable with said malleable roller-surface.

In testimony whereof we have hereunto set our hands this 31st day of March, 1902.

THEODORE D. ROBINSON.

RANSOM D. VIELE.

Witnesses:

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E. M. O'REILLY.