

No. 667,450.

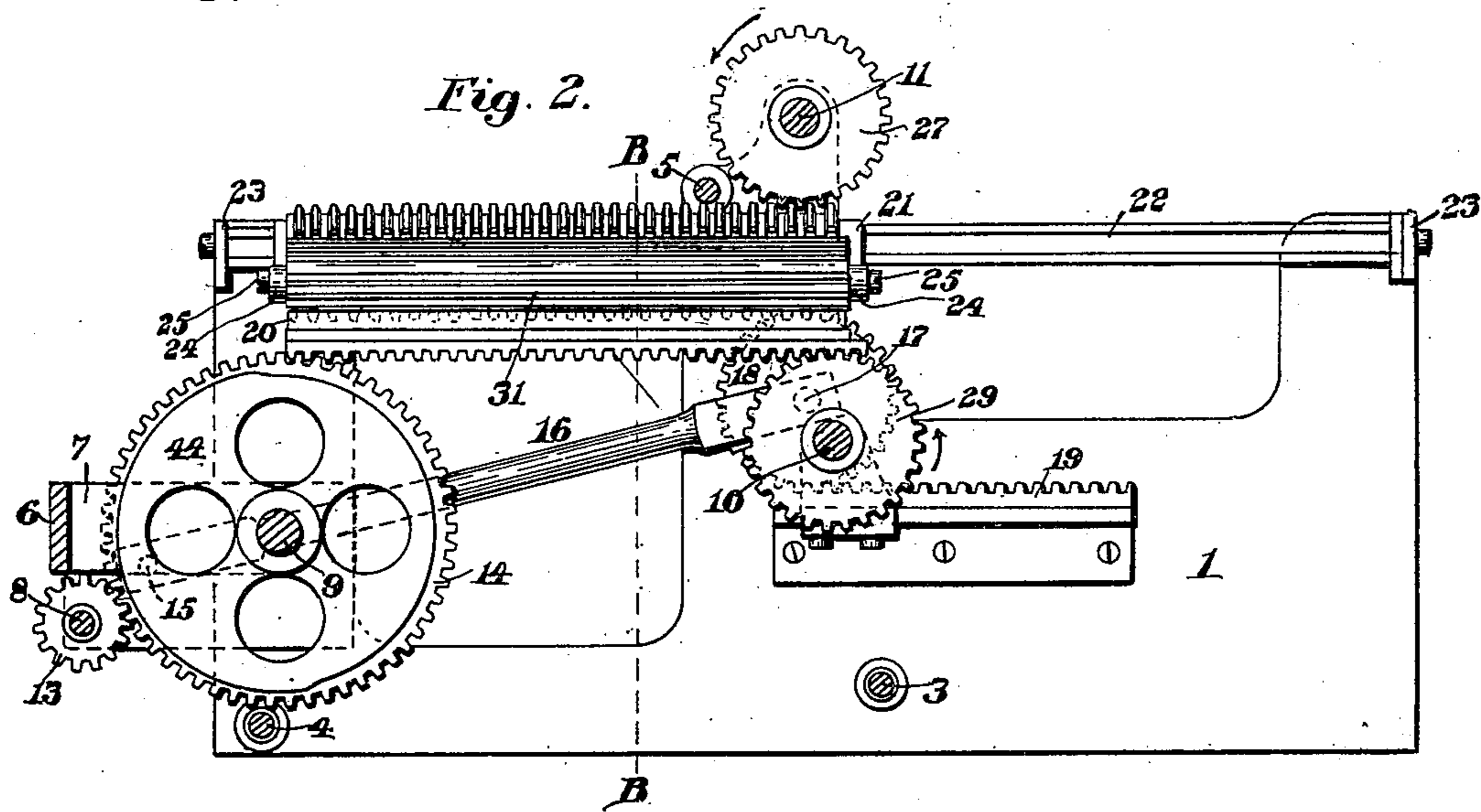
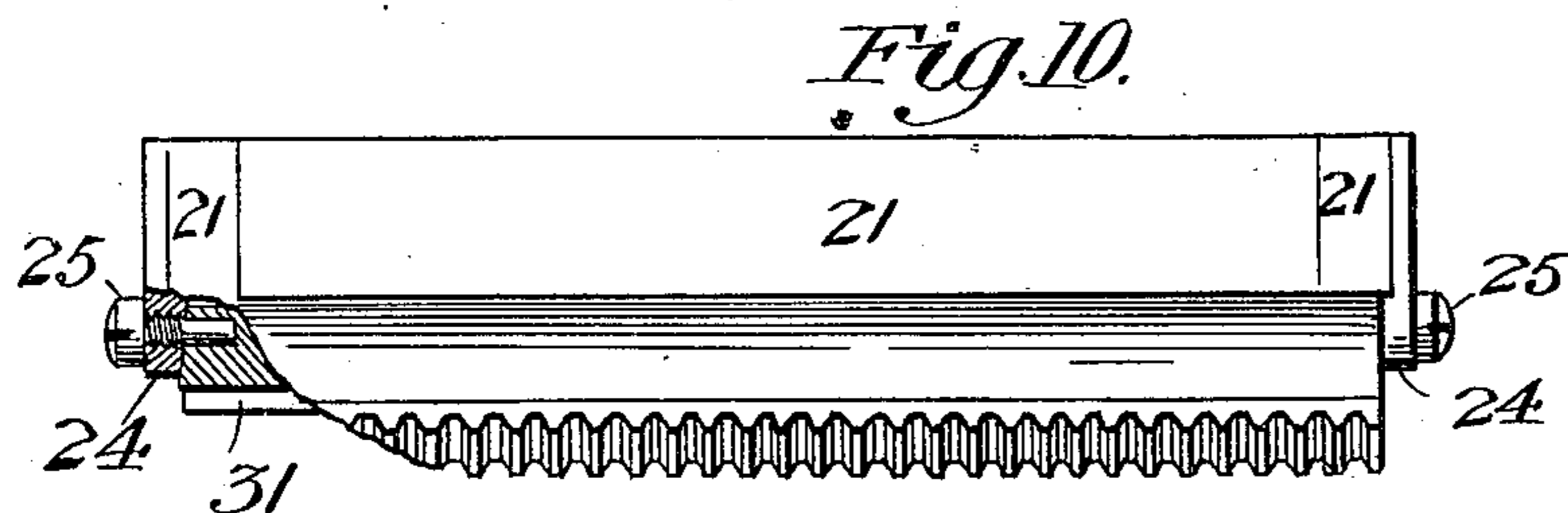
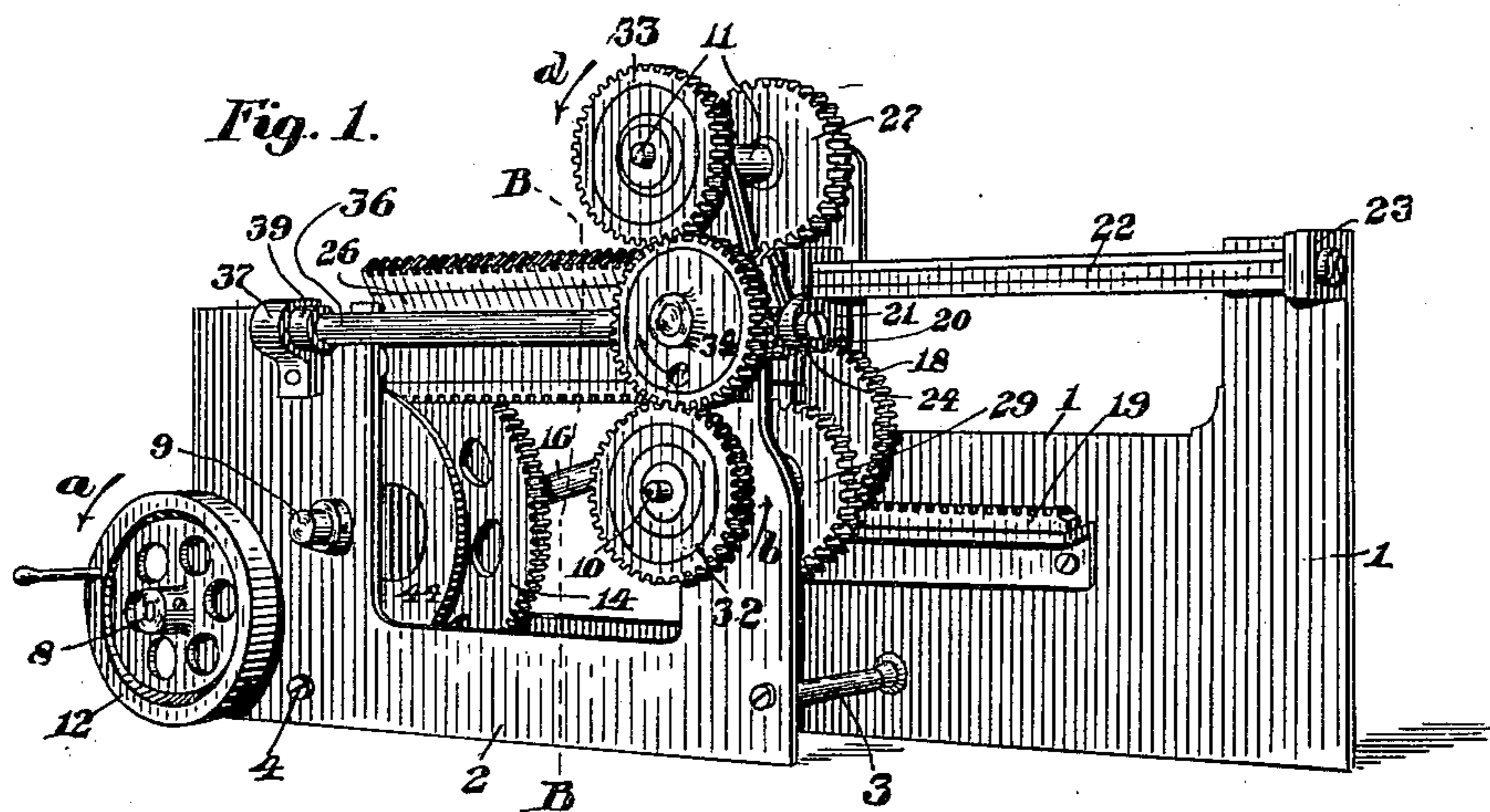
Patented Feb. 5, 1901.

G. F. McINDOE.
MECHANICAL MOVEMENT.

(Application filed Aug. 14, 1900.)

(No Model.)

2 Sheets—Sheet 1.



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2 Sheets—Sheet 2.

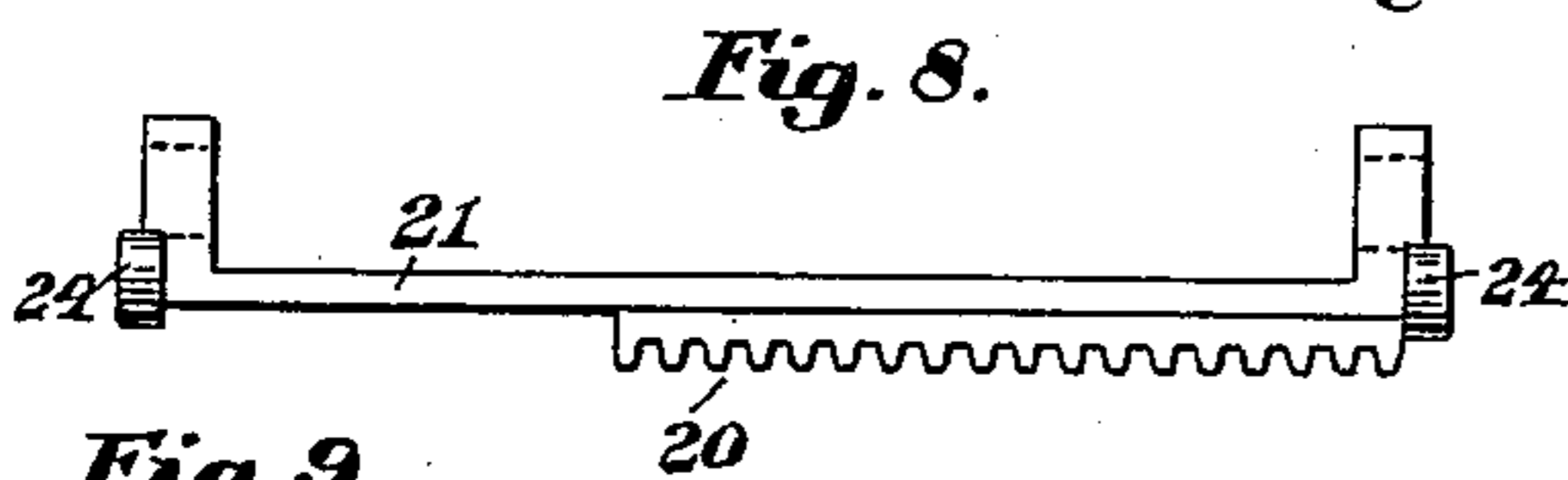
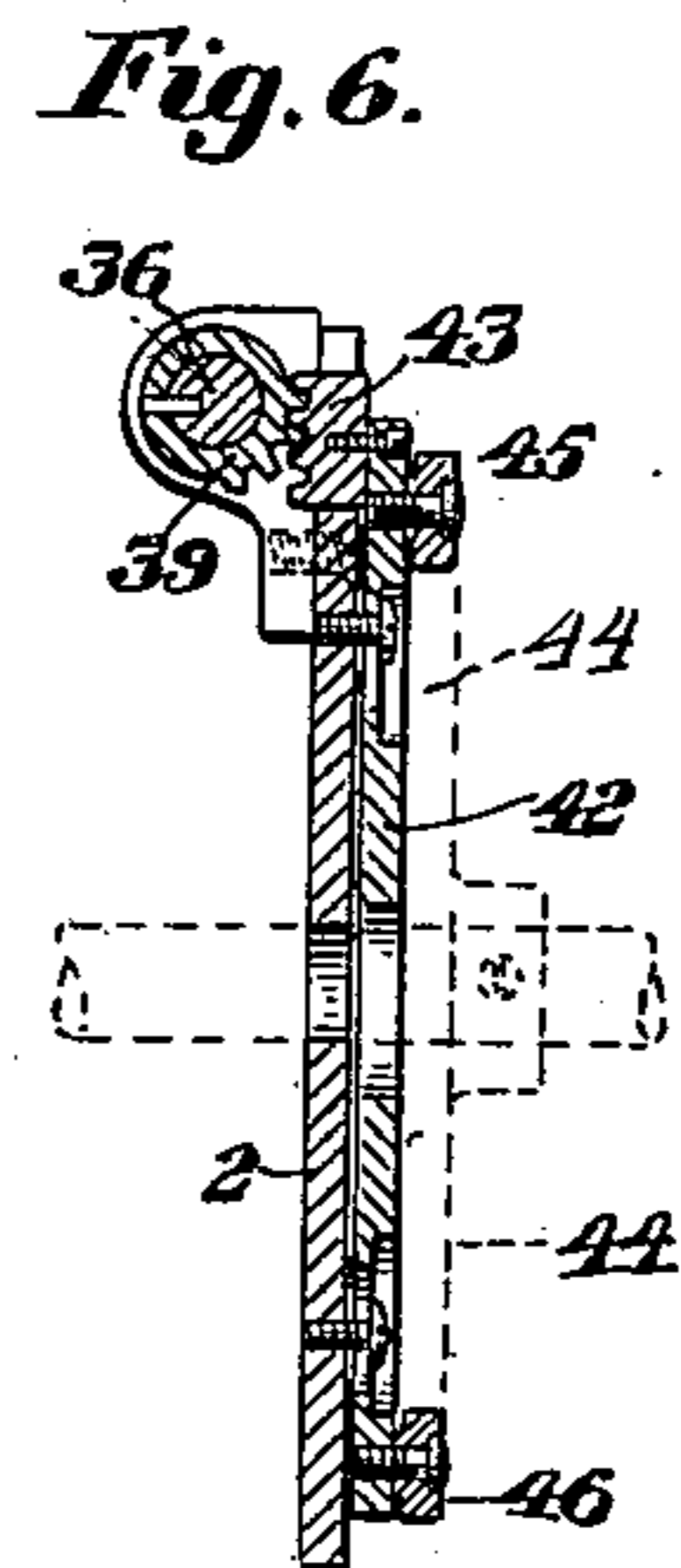
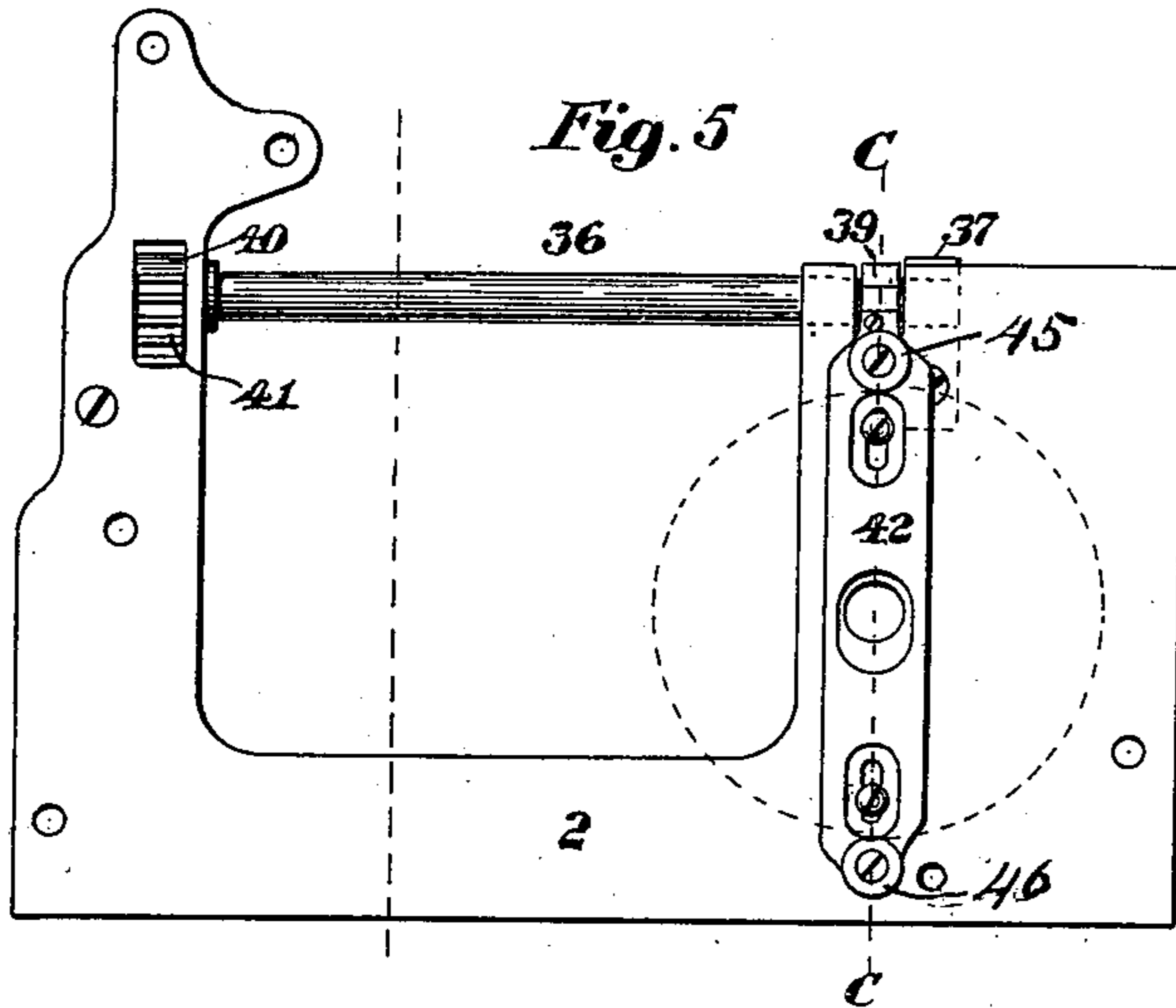


Fig. 4.

Fig. 9.

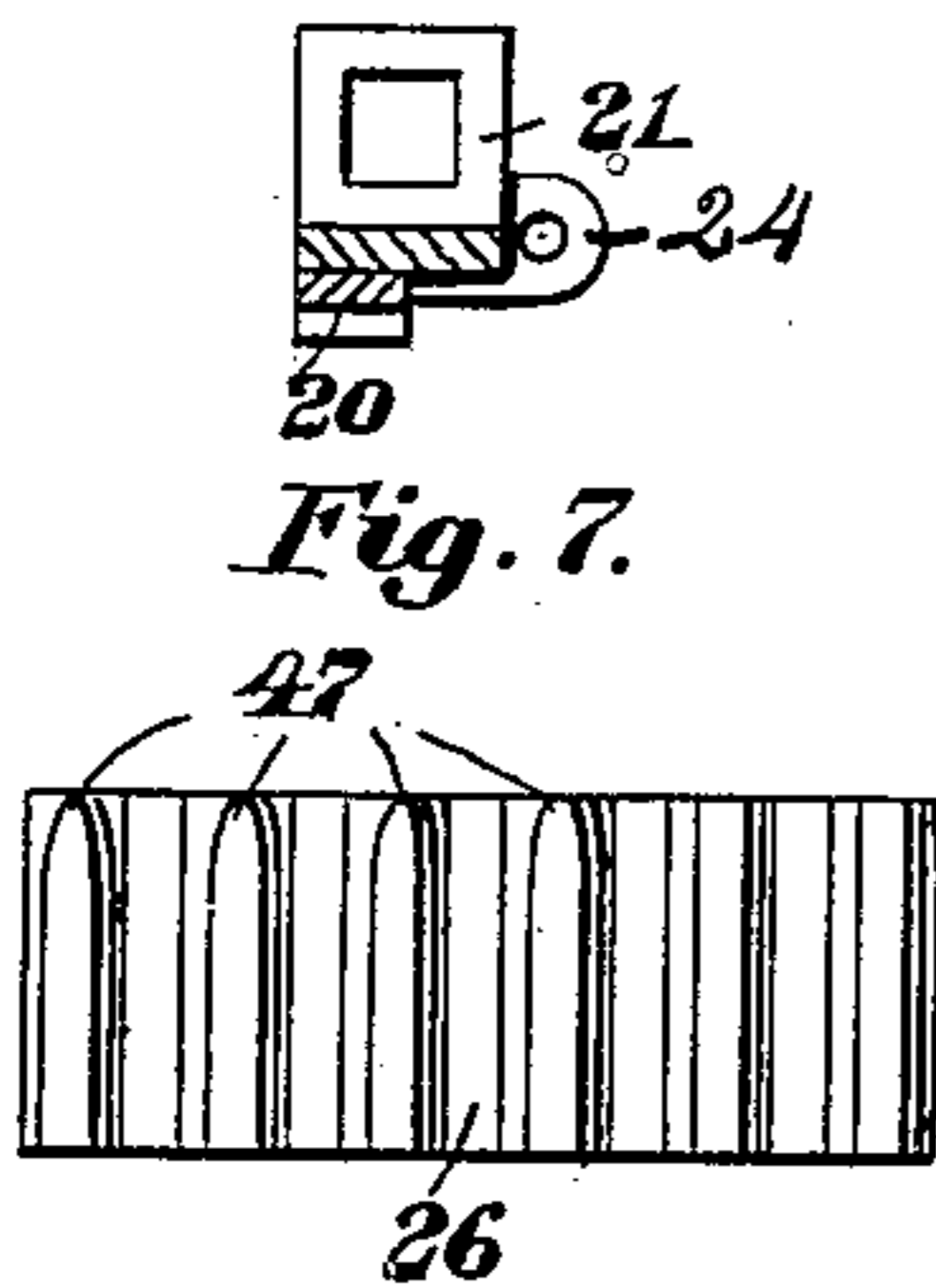
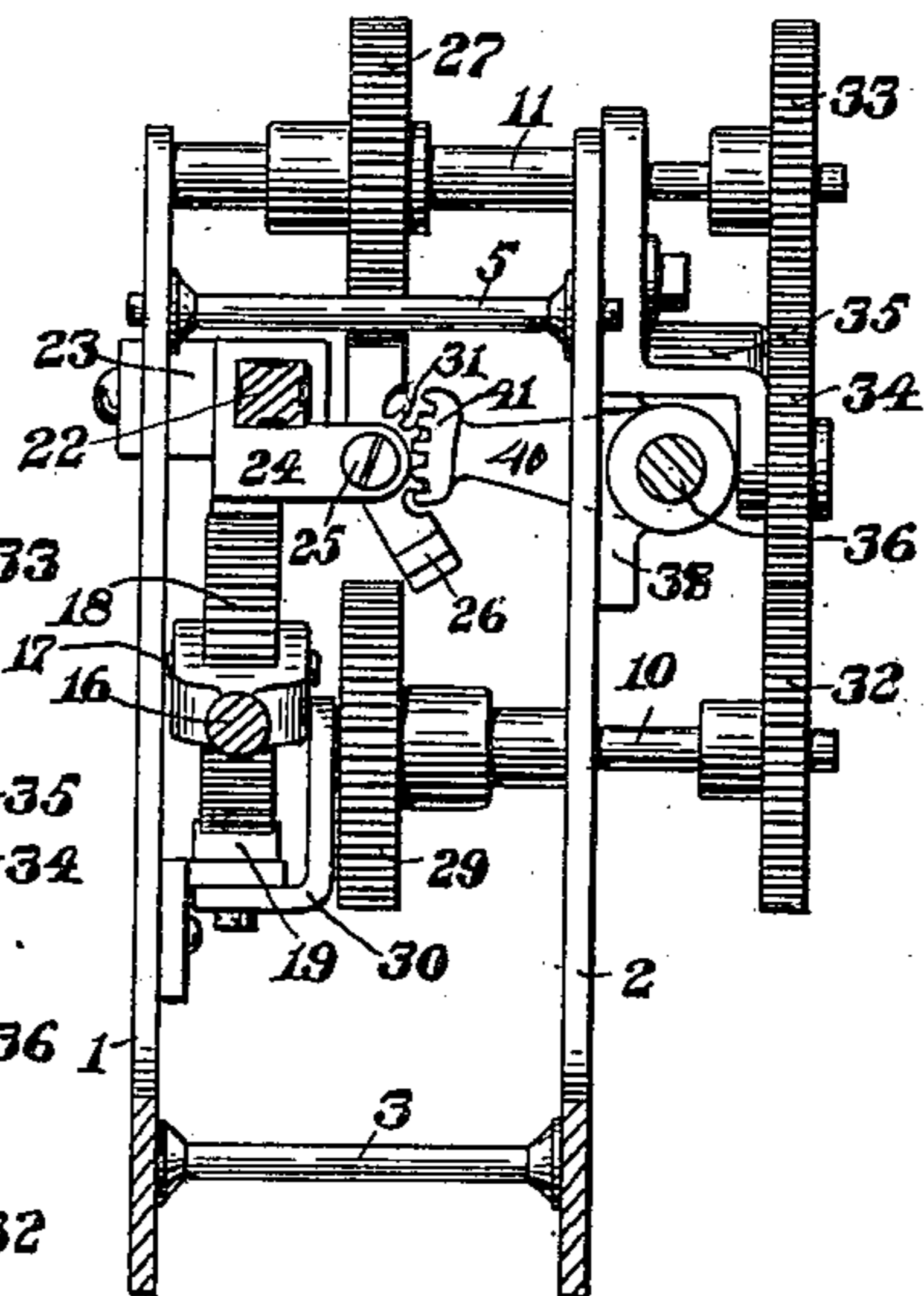
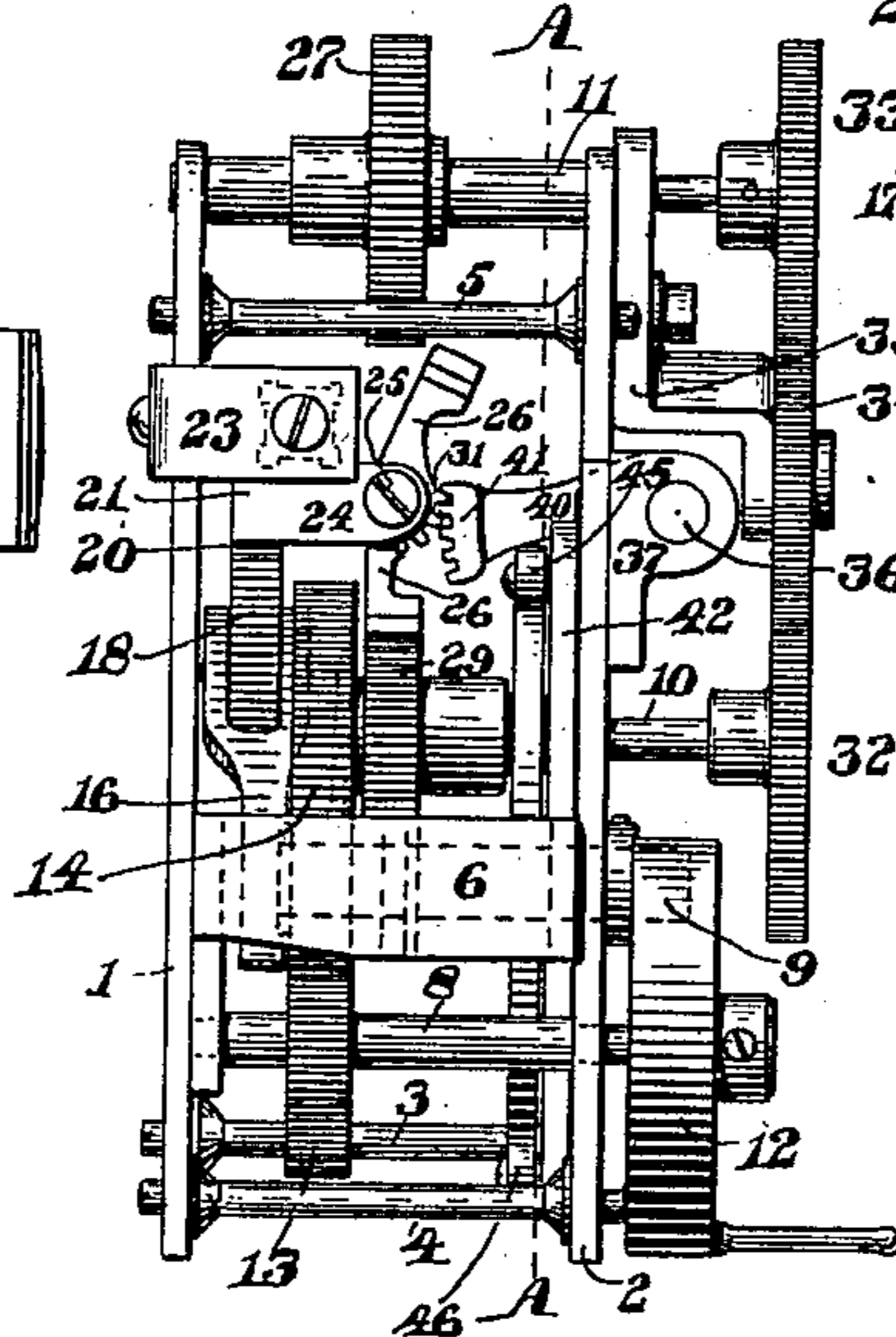


Fig. 3.



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UNITED STATES PATENT OFFICE.

GEORGE F. MCINDOE, OF BOSTON, MASSACHUSETTS, ASSIGNOR OF ONE-HALF
TO JAMES W. MCINDOE, OF SAME PLACE.

MECHANICAL MOVEMENT.

SPECIFICATION forming part of Letters Patent No. 667,450, dated February 5, 1901.

Application filed August 14, 1900. Serial No. 26,818. (No model.)

To all whom it may concern:

Be it known that I, GEORGE F. MCINDOE, of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and
5 useful Mechanical Movement, of which the following, taken in connection with the accompanying drawings, is a specification.

My invention relates to a mechanical movement, and has for its object the production of
10 a simple, effective, and durable means of imparting to a shaft and any object carried thereby two revolutions in the same direction, with a short standstill between said two revolutions, by means of a single reciprocation or a back-and-forth motion of the impelling object, and is especially adapted, among
15 other uses, to operating the impression-cylinder of a printing-press of the class termed "two-revolution cylinder-presses;" and it
20 consists in certain novel features of construction, arrangement, and combination of parts, which will be readily understood by reference to the description of the accompanying drawings and to the claims hereto appended and
25 in which my invention is clearly pointed out.

Figure 1 of the drawings is a perspective view of a machine embodying my invention. Fig. 2 is sectional elevation of the same, the cutting plane being on line A A on Fig. 3. Fig. 3 is an end elevation looking at the left-hand ends of Figs. 1 and 2. Fig. 4 is a vertical section on line B B on Figs. 1 and 2 looking toward the right of said figures, but with the pivoted or oscillating rack in changed
35 position. Fig. 5 is an inside elevation of the side frame 2, with certain parts carried thereby. Fig. 6 is a vertical section on line C C on Fig. 5. Fig. 7 is a plan or edge view of a portion of the pivoted rack drawn to an enlarged scale. Figs. 8 and 9 are, respectively,
40 a side elevation and a transverse section of the carriage which carries the oscillating rack; and Fig. 10 is a plan of the carriage and the oscillating double rack pivoted thereto, with
45 one of the ears of said carriage shown in section, said figure being drawn to an enlarged scale.

In the drawings, 1 and 2 are the side frames, of different lengths and connected together
50 by the tie-rods 3, 4, and 5 and the girth 6, as shown. In bearings in said frames and in the

bracket 7, formed in one piece with or secured to and projecting inward from said girth, are mounted the revoluble shafts 8, 9, 10, and 11. The shaft 8 is the driving-shaft and has firmly
55 secured on one end thereof the driving-pulley 12 and between said frames the pinion 13, which engages with and imparts motion to the gear-wheel 14, firmly secured upon the shaft 9, as shown in Fig. 2. The gear-wheel
60 14 has set in one side thereof the crank-pin 15, (shown only in dotted lines in Fig. 2,) upon which is mounted one end of the connecting-rod 16, the opposite end of which is forked and has set in a fixed position in the
65 prongs of said fork the stud 17. (Shown in Fig. 4 and by a dotted circle in Fig. 2.) Upon said stud is loosely mounted between the prongs of said fork the spur gear-wheel 18, the teeth of which on its under side engage
70 the teeth of the stationary rack 19, firmly secured to the frame 1, and at its upper side with the rack 20, secured to or formed in one piece with the carriage 21, mounted upon and
75 movable endwise of the guide-bar 22, mounted in a fixed position in ears 23, projecting inward from the frame 1, as shown.

The carriage 21 is provided with two inwardly-projecting ears 24, one at each end, in which are fitted the pivot-screws 25, upon
80 which is mounted the oscillating bar or plate 26, the two wings of which radiate from its axis of motion in different planes and extend to equal distances from said axis of motion, and each wing has formed upon its edge a series of rack-teeth all so arranged that when
85 the upper wing is in a vertical position its teeth will be in engagement with the teeth of the gear-wheel 27, firmly secured upon the shaft 11, which is the shaft to which it is desired to impart two revolutions in the same
90 direction at each back-and-forth motion of the carriage 21 and may be said to represent the shaft of the impression-cylinder of a reciprocating-bed printing-press, while the carriage 21 may represent the bed of said press.
95

If the plate 26 be moved about its axis from the position shown in Fig. 4 to the position shown in Fig. 3, the teeth on the upper edge thereof will be disengaged from the teeth of
100 the gear-wheel 27, and the teeth on the lower edge thereof will be engaged with the gear-

wheel 29, fixed on the shaft 10, the inner end of which has its bearing in the stand 30. (Shown in Fig. 4.)

The central portion of the pivoted rack-plate 26 is provided with a series of gear-teeth 31, arranged in the form of a segment concentric with the axis of motion thereof and extending the entire length of said plate, as shown in Figs. 2, 3, and 4.

The ends of the shafts 10 and 11 have secured thereon outside of the frame 2 the spur gear-wheels 32 and 33, respectively, and said gears are connected by the intermediate gear-wheel 34, mounted upon a stud set in the stand 35, secured to the frame 2, as shown.

A rocker-shaft 36 is mounted in suitable bearings 37 and 38, secured to the frame 2, and has secured thereon near the bearing 37 the gear-segment 39 and upon its opposite end the arm 40, having the gear-segment 41 on its inner end, which is always in engagement with the teeth 31 on the oscillating rack-plate 26 and by its movement about the axis of the shaft 36 will oscillate said rack-plate at the proper time to change its engagement from the gear-wheel 29 to the gear-wheel 27, or vice versa.

On the inside of the frame 2 and nearly opposite the bearing 37 is mounted so as to be moved vertically the plate or bar 42, having formed upon or secured to the outer face of its upper end a short toothed rack 43, which engages the teeth of the segment 39, so that by a vertical reciprocation of said plate the shaft 36 will be oscillated, and through the action of the segment 41 upon the teeth 31 of the rack-plate 26 said plate will be moved about its pivotal axis.

The plate 42 is moved upward and downward to oscillate the shaft 36 by the cam 44, secured upon the shaft 9 and acting alternately upon the trucks 45 and 46, mounted on studs set in said plate 42 at opposite ends thereof, as shown in Figs. 5 and 6.

To insure certain engagement of the teeth of the pivoted rack-plate with the gears 27 and 29 when it is oscillated, I make three or four of the teeth at each end of the rack-plate 26, on both the upper and lower edges thereof, with tapered or wedge-shaped rear ends, as shown at 47 on Fig. 7.

The operation of my invention is as follows: The several parts of the machine being in the positions shown in the drawings, if the pulley 12 be revolved in the direction indicated by the arrow *a*, Fig. 1, the first operation produced is for the cam 44 to move the plate 42 and its rack 43 upward, thereby moving the shaft 36 about its axis to raise the inner or toothed end 41 of the arm 40, and thus rock the pivoted rack-plate 26 from the position shown in Fig. 3 to the position shown in Fig. 4, with its upper rack-teeth in engagement with the teeth of the gear-wheel 27. This reversing of the position of said rack-plate 26 takes place while the crank-pin 15 is passing the dead-centers and is accomplished so rap-

idly that no perceptible movement of said plate in the direction of its length takes place during such reversing; but a continuation of the movement of the crank-pin 15 about the axis of the shaft 9 until it reaches the opposite dead-center causes the rack-plate 26 to be moved endwise toward the right of Figs. 1 and 2 just far enough for its teeth to impart to the gear 27 and the shaft 11 one complete revolution, when the cam 44, acting upon the truck 46, moves the plate 42 and its rack 43 downward, thereby reversing the motions of the shaft 36 and the arm 40, thereby moving the rack-plate 26 about its axis of oscillation to disengage the teeth on its upper edge from the gear 27 and cause the teeth on its lower edge to engage the teeth of the gear-wheel 29, when the rack-plate will be moved toward the left of Figs. 1 and 2, thereby rotating the gear 29, its shaft 10, and the gear 32 in the direction indicated by the arrow *b* on Figs. 1 and 2. The intermediate gear 34 will be revolved in the direction indicated by the arrow *c* on Fig. 1, and the shaft 11 and gears 27 and 33 will be revolved in the same direction as before and as indicated by the arrow *d* on Figs. 1 and 2. These operations may be continued indefinitely, or as long as rotary motion is imparted to the pulley 12 either by hand or power.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. The combination of a shaft to be revolved intermittently always in the same direction; a second shaft arranged in a position below said first-mentioned shaft and parallel therewith; a pair of duplicate gear-wheels secured one on each of said shafts in the same vertical plane but separated from each other; a pivoted reciprocating rack-plate provided with two series of rack-teeth arranged on opposite edges thereof and adapted to alternately engage said two gears; a train of gears connecting said two shafts in a plane parallel to said first-mentioned gears; means for reciprocating said rack-plate; and means for moving said rack-plate about its pivotal axis at the end of each endwise movement thereof to change the engagement of said rack-plate from one gear to the other.

2. The combination of two parallel shafts arranged one above the other; a pair of gear-wheels of equal diameters, but considerably less than the distance between the centers of said shafts mounted one upon each of said shafts and in the same vertical plane a reciprocating carriage mounted on suitable guideways between said shafts; a pivoted rack-plate carried by said carriage and provided with two series of rack-teeth on opposite edges thereof, the face of the teeth on one edge being at an angle to the face of the teeth on the other edge, and also provided with the longitudinally-extending teeth 31 arranged concentric to its axis of vibration; means for reciprocating said carriage and rack-plate; a rocker-shaft; a toothed segment carried by

said shaft and engaging the longitudinal segmental teeth on said rack-bar; a vertically-movable bar provided with a short toothed rack on its upper end; a second toothed segment carried by said rocker-shaft and engaging said short vertically-movable rack; a cam constructed and arranged to act upon said vertically-movable bar to move it and its rack, to oscillate said rocker-shaft; and a train of gears connecting said parallel shafts in a plane parallel to said first-mentioned gears.

3. The combination of the shafts 10 and 11 arranged one above the other; the gears 29 and 32 mounted on shaft 10; the gears 27 and 33 mounted on shaft 11; the intermediate gear 34 engaging gears 32 and 33; the carriage 21 mounted on a suitable guideway; the rack 20 carried by said carriage; the fixed rack 19; the rack-plate 26 pivoted to said carriage and having a series of rack-teeth on each edge thereof and a segment of longitudinally-extending teeth 31; the crank 14, 15, the connecting-rod 16; the gear-wheel 18 carried by the forked end of said connecting-rod 16, and

engaging the fixed rack 19, and the rack 20 on the carriage 21; the rocker-shaft 36; the toothed segments 39 and 41; the rack-bar 42, 43; the trucks 45 and 46 carried by said bar 42; and the cam 44 all constructed arranged and operating substantially as described.

4. As a means of alternately rotating two gear-wheels, arranged in the same vertical plane, always in the same direction, the reciprocating and oscillating rack-plate 26, having a series of rack-teeth on each edge thereof, each of which series of rack-teeth is arranged to engage the teeth of one of said two gears while the other of said series of racks is disengaged from the teeth of the other of said gears, and vice versa.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses on this 8th day of August, A. D. 1900.

GEORGE F. McINDOE.

Witnesses:

N. C. LOMBARD,
JAMES A. WOODBURY.