

No. 705,852.

Patented July 29, 1902.

J. LEHMANN & H. MAURER.
DOUBLE WORKING PLANING MACHINE.

(Application filed Mar. 4, 1902.)

(No Model.)

2 Sheets—Sheet 1.

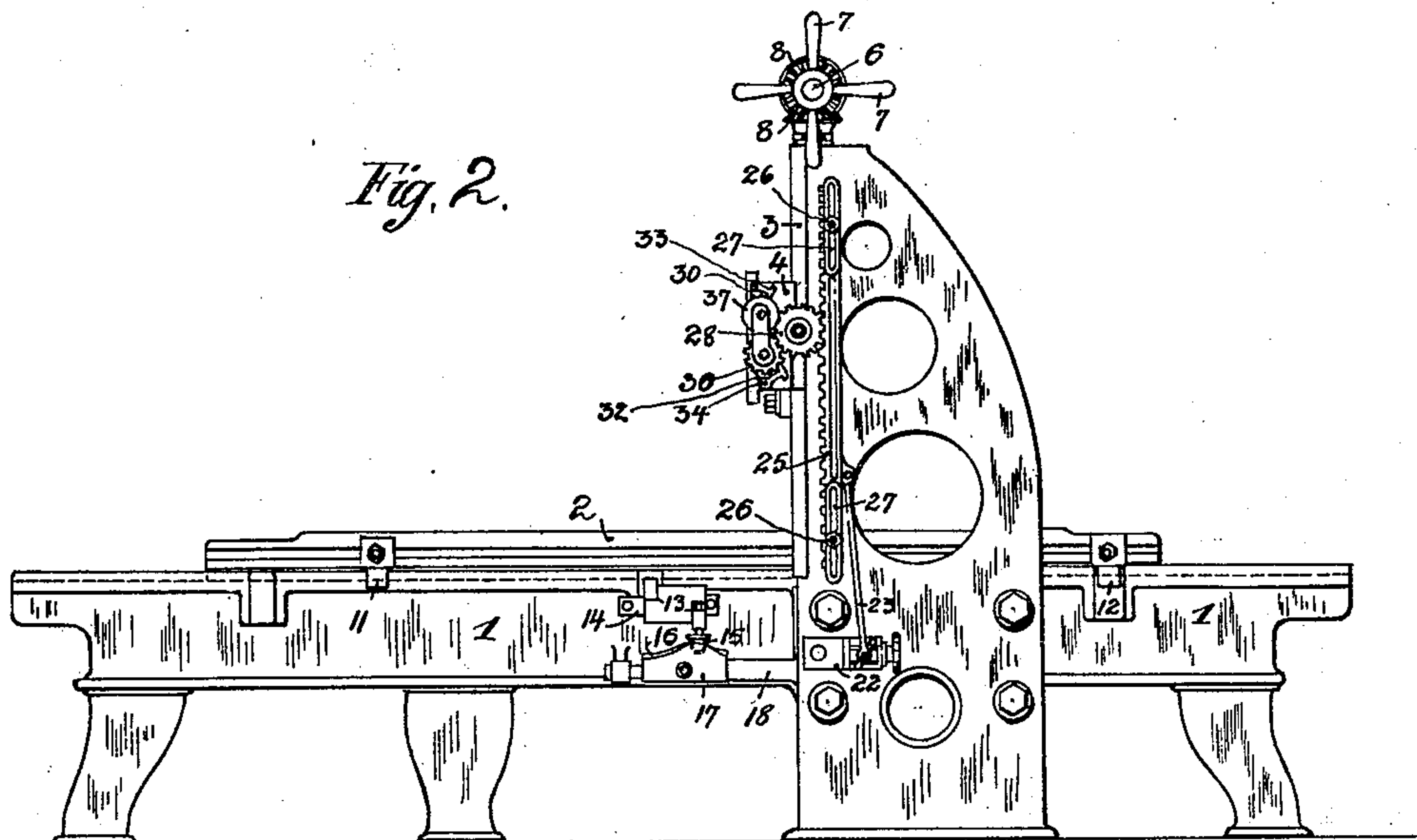
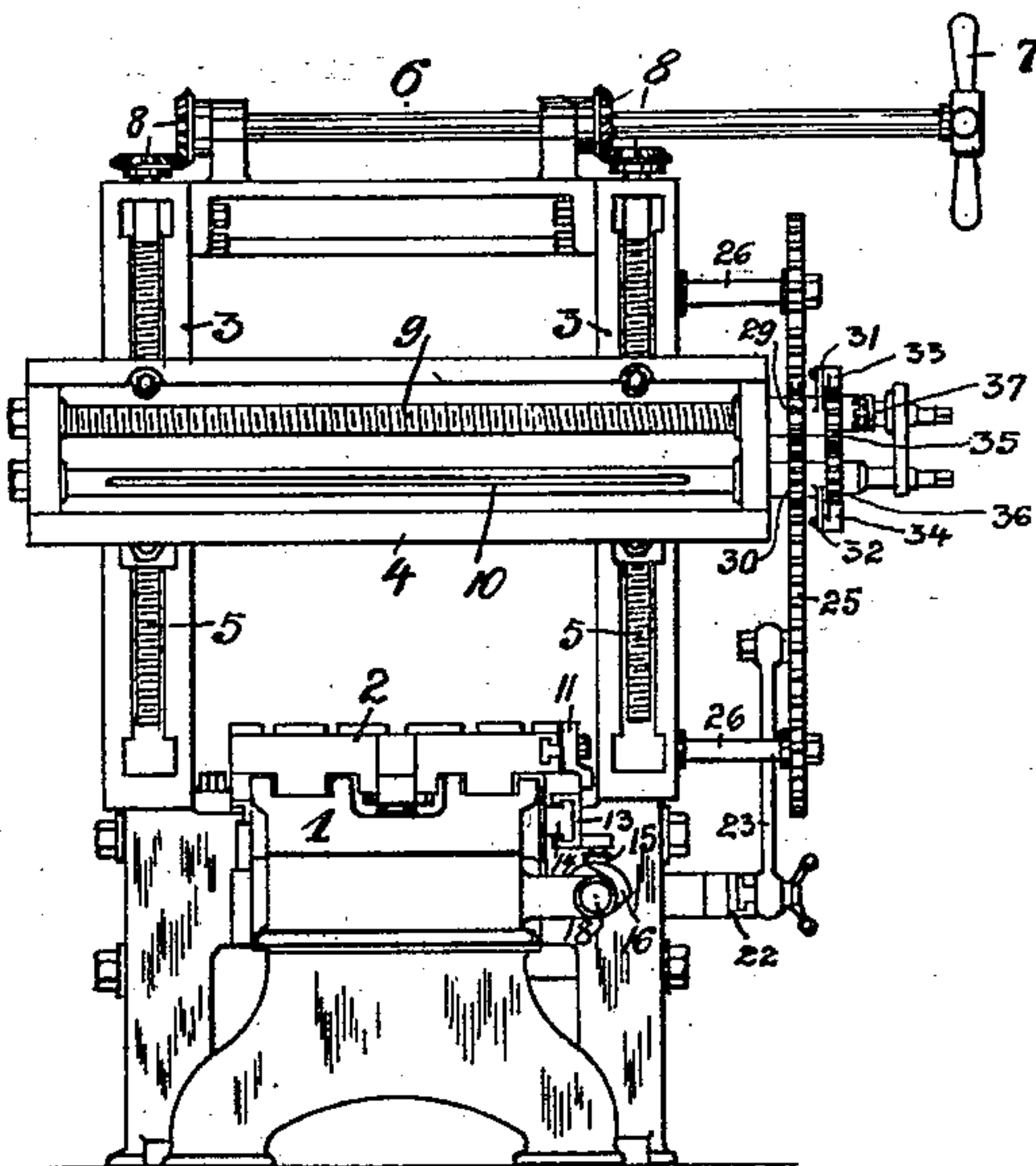


Fig. 1



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2 Sheets—Sheet 2.

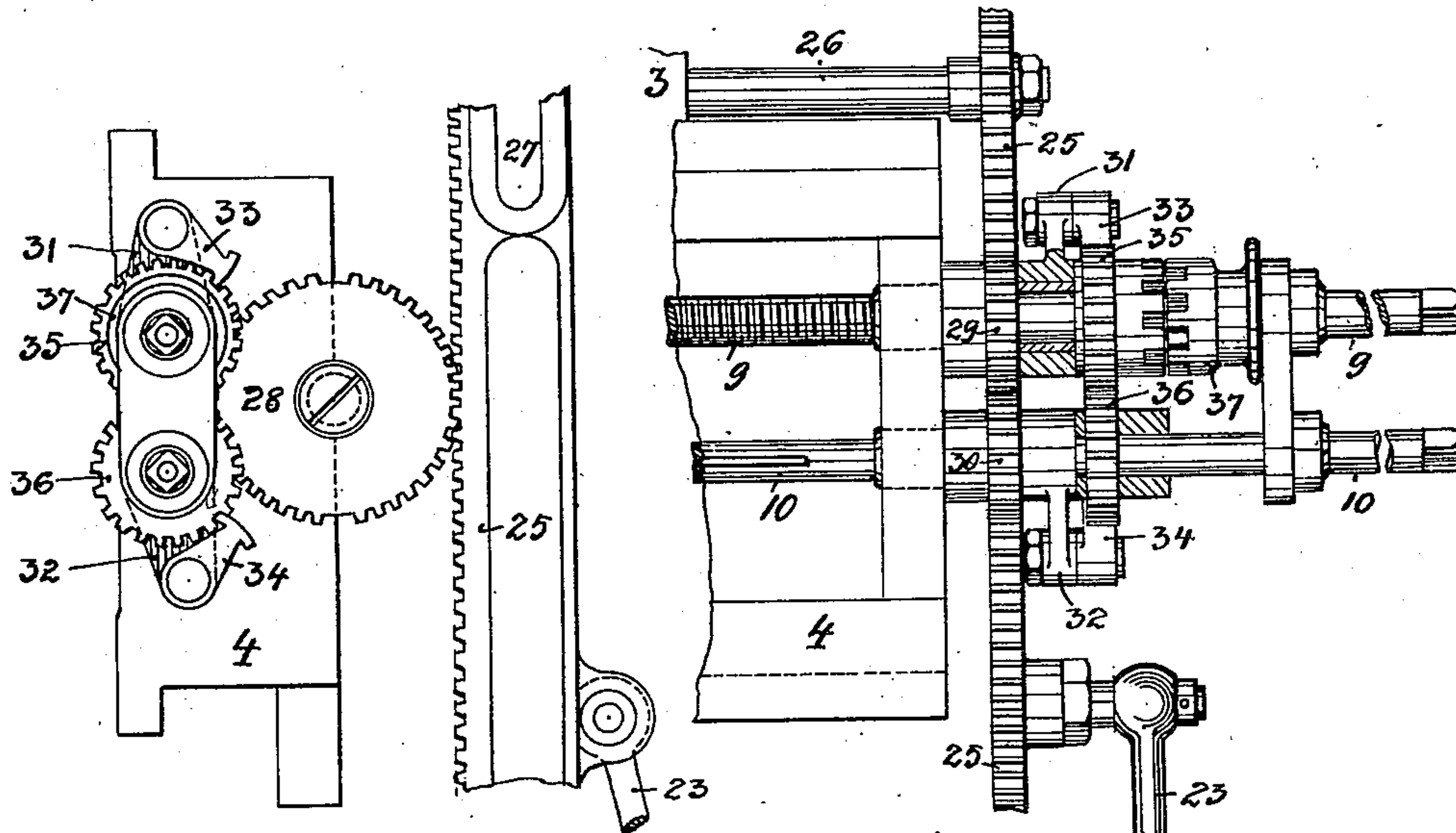


Fig. 3.

Fig. 4.

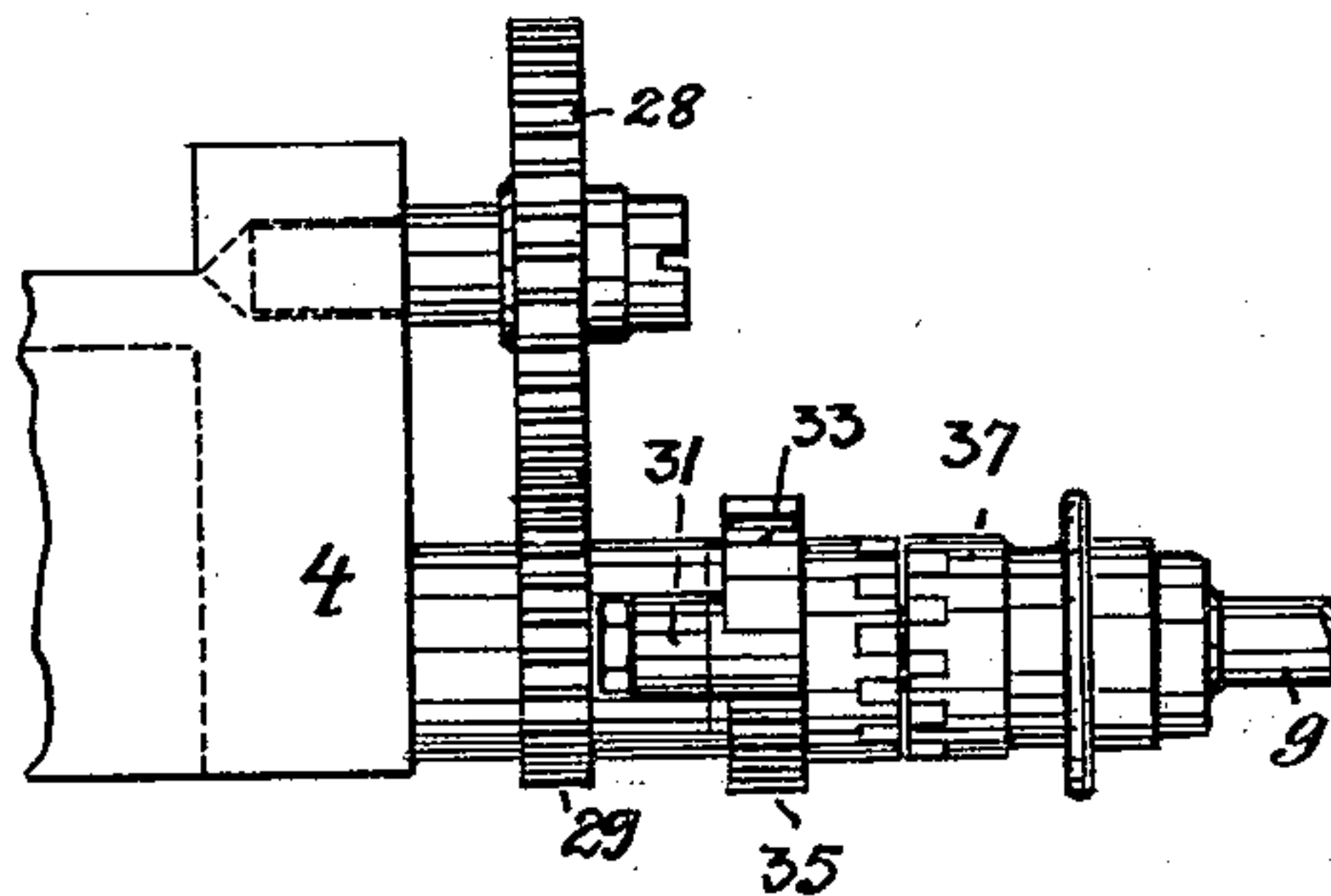
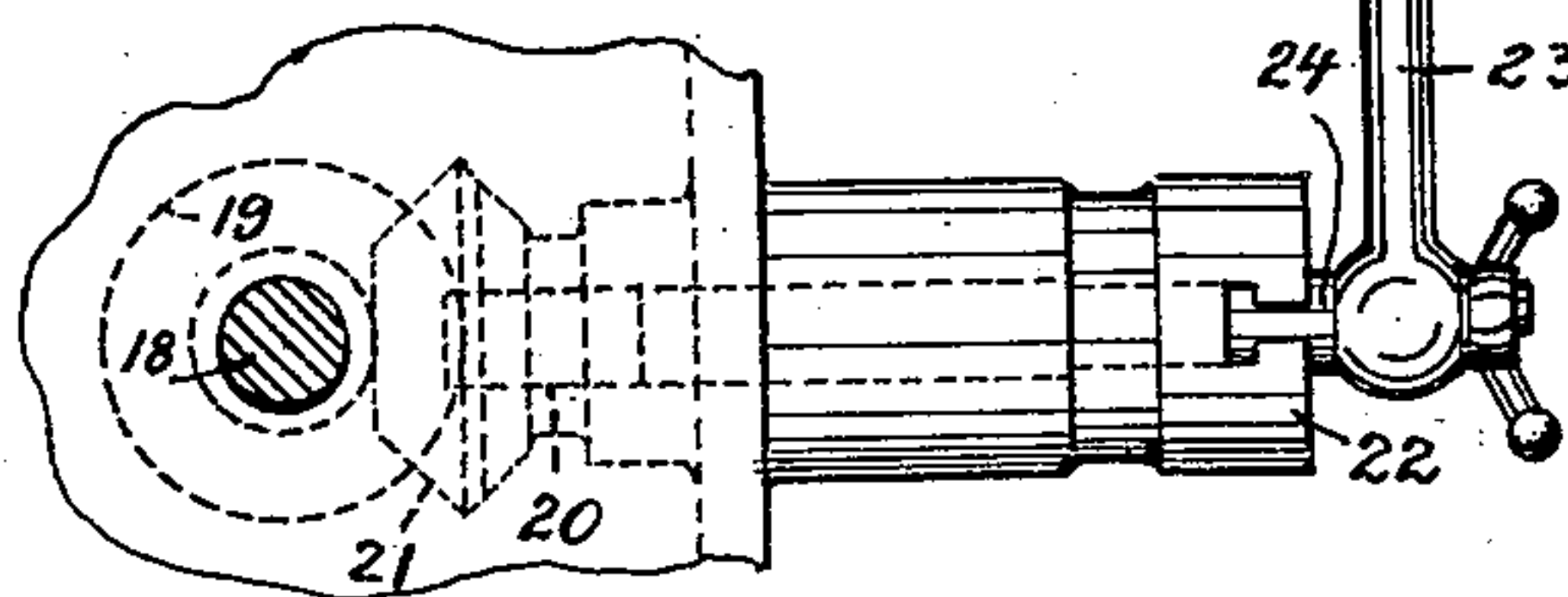


Fig. 5.

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UNITED STATES PATENT OFFICE.

JACOB LEHMANN AND HERMANN MAURER, OF BOCKENHEIM, GERMANY.

DOUBLE-WORKING PLANING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 705,852, dated July 29, 1902.

Application filed March 4, 1902. Serial No. 96,713. (No model.)

To all whom it may concern:

Be it known that we, JACOB LEHMANN and HERMANN MAURER, managers, subjects of the Emperor of Germany, and residents of 61 and 5 62 Adalbertstrasse, Bockenheim, near Frankfurt-on-the-Main, Germany, have invented certain new and useful Improvements in Double-Working Planing-Machines, of which the following is a specification.

10 Our invention relates to double-working planing-machines, and more particularly to that class of such machines in which the work-piece is planed both during the forward and backward motion of the table.

15 The invention consists in the new arrangements for effecting the lateral or vertical feed of the tool-holder at each end of the stroke or travel, whereby each stroke of the machine is utilized and an idle return avoided, as is well 20 known in such like machines.

The invention is illustrated in the accompanying drawings, in which—

Figure 1 is a front elevation of the machine with our improvements, the tool-holder and 25 its vertical slide being omitted. Fig. 2 is a side elevation of said machine. Fig. 3 illustrates, on an enlarged scale, the feed-actuating device in side elevation. Fig. 4 is a front elevation of said device, partly shown in section. Fig. 5 is a plan view of the device 30 shown in Figs. 3 and 4.

In the construction of our invention we use the bed 1 and the table 2, horizontally moved back and forth thereon by means of a suitable gear, (not shown,) the vertical frame or 35 slides 3 3 for the cross-rail 4, screw-spindles 5, engaging said cross-rail, and a horizontally-journaled spindle 6 with handles 7, mounted at the top of said frame for actuating said 40 screw-spindles by means of two pairs of bevel-wheels 8 8, for the purpose of raising and lowering said cross-rail 4 when adjusting the tool-box (not shown) to the work-piece. Mounted in the cross-rail 4 are two spindles 45 9 and 10, as shown in Figs. 1 and 4. Spindle 9 is screw-threaded and serves for the horizontal automatic feed motion of the tool-holder slide. (Not shown.) Spindle 10 has a groove throughout its length, which groove 50 is adapted to be engaged by the tongue of the usual bevel-wheel, (not shown,) which is ordinarily mounted within the tool-holder slide

traveling therewith and by suitable means operates the vertical screw-spindle for the automatic vertical feed of the tool-holder on 55 its slide. The beforementioned bevel-wheel may be thrown out of gear with said vertical spindle in the well-known manner. The table 2 has two adjustable tappets 11 and 12, which move a slide 13 on its guide 14 forward or backward at each end of the stroke. 60 A pin 15, secured to said slide 13, engages the spirally-grooved cam 16 of a sleeve 17, secured to a horizontally-journaled shaft 18, which latter carries a bevel-wheel 19 at its other 65 end, and thereby imparts, owing to the reciprocating motion of said slide 13, a corresponding turning motion to a shaft 20, which is provided with a bevel-wheel 21 at its one end engaging said wheel 19 and with a slotted 70 crank-disk 22 at its other end. All these before-described arrangements are well known in such like machines. Thus it will be understood that a swinging motion is imparted to said crank-disk by each stroke of the table 75 at the end of said stroke. A connecting-rod 23 is pivoted to a piece 24, adjustably secured within the slot of said crank-disk, and has its upper end pivotally connected to a vertical rack-bar 25, guided to move up and down 80 on two guide-bolts 26, which extend from the frame of the machine and engage two slots 27, respectively formed in the ends of said rack-bar. The latter gears with a gear 28, mounted 85 in a bearing which extends from the cross-rail 4. Gear 28 engages two toothed wheels 29 and 30, which are respectively arranged on the spindles 9 and 10, so as to rotate freely thereon. Feed-arms 31 and 32 are rigidly connected to said wheels 29 and 30, respectively, 90 and carry spring-actuated pawls 33 and 34, which are adapted to engage two ratchet-wheels 35 and 36, meshing with each other. Said wheels are mounted on the spindles 9 and 10. Ratchet 36 is rigidly secured to 95 spindle 10, and ratchet 35 is loosely mounted on its spindle 9 and is provided with teeth adapted to engage corresponding recesses formed in a clutch 37. The latter slides readily on the spindle 9 and is connected 100 therewith by groove and tongue, which provides means for engaging or disengaging said ratchet 35 with its spindle 9.

The operation of the mechanism will be

fully understood from the following description: Motion is communicated from the stroke of the table at each end thereof through the medium of tappets 11 and 12, slide 13, pin 15, spiral cam 16 on sleeve 17, shaft 18, gears 19 21, shaft 20, crank-piece 22, and connecting-rod 23 to the rack-bar 25, moving, respectively, up or down at each end of the stroke. When clutch 37 is disengaged, no motion is transmitted to spindle 9. The motion which is imparted to spindle 10 may or may not act upon the tool-holder, (not shown,) so as to effect an automatic vertical feed of the same, according as the bevel-wheel (not shown) on said spindle is thrown out of gear with the vertical feed-screw in the slide of said tool-holder. Supposing the double-acting pawls 33 and 34 are in position, as shown in Figs. 2 and 3, and the clutch is engaged with ratchet-wheel 35, then the rack-bar raised by the stroke of the table turns by the medium of gear 28 the toothed wheel 29, so that feed-arm 31 by pawl 33 operates ratchet 35, thus turning spindle 9 to the right, while pawl 34 is slipping over its ratchet. By the return stroke of the table the rack-bar is lowered, and thereby pawl 34 operates its ratchet 36 and through the medium of ratchet-wheel 35, meshing therewith, the spindle 9 is likewise further turned to the right, while pawl 33 is slipping over its ratchet. During this operation spindle 10 has no action on the tool-holder, as its bevel-wheel remains disengaged. It may be noted that the pawls 33 and 34 must always be turned over to the same side when operating. For turning spindle 9 to the left said pawls are moved over, so as to operate the ratchet-wheels in the opposite direction. The rack-bar on its upstroke causes the meshing ratchet-wheels to be operated by pawl 34. The descending rack-bar forces the upper pawl to turn ratchet 35 di-

rectly. In this manner an automatic horizontal feed in both directions is effected, as will be clearly understood.

The vertical automatic feed motion of the tool-holder (not shown) will be effected by disengaging clutch 37 and engaging the bevel-wheel (not shown) rotating with spindle 10 with the vertical feed-screw of the tool-holder. Every raising and lowering of the rack-bar will then produce an automatic vertical feed of the tool-holder in the manner as above described with the horizontal feed.

Having now described our invention, we claim—

In a double-working planing-machine, the combination with the bed and table, the frame for vertically guiding the cross-rail and said cross-rail, of a horizontal feed-screw spindle in said cross-rail, a grooved spindle in said latter parallel to said screw-spindle, guides extending from said frame, a rack-bar vertically movable up or down on said guides and means on the table to so move it at each end of the stroke of the table, a gear-wheel mounted on said cross-rail and meshing with said rack-bar, two toothed wheels in gear with said gear and loosely mounted on said spindles respectively, a ratchet-wheel rigidly fastened on said grooved spindle adjacent to said toothed wheel, another ratchet-wheel loosely mounted on said screw-spindle, a clutch on said screw-spindle adapted to engage its ratchet-wheel so as to connect the same to the spindle, arms in rigid connection with said toothed wheels and pawls carried on said arms for engaging said ratchet-wheels in either direction, substantially as described.

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