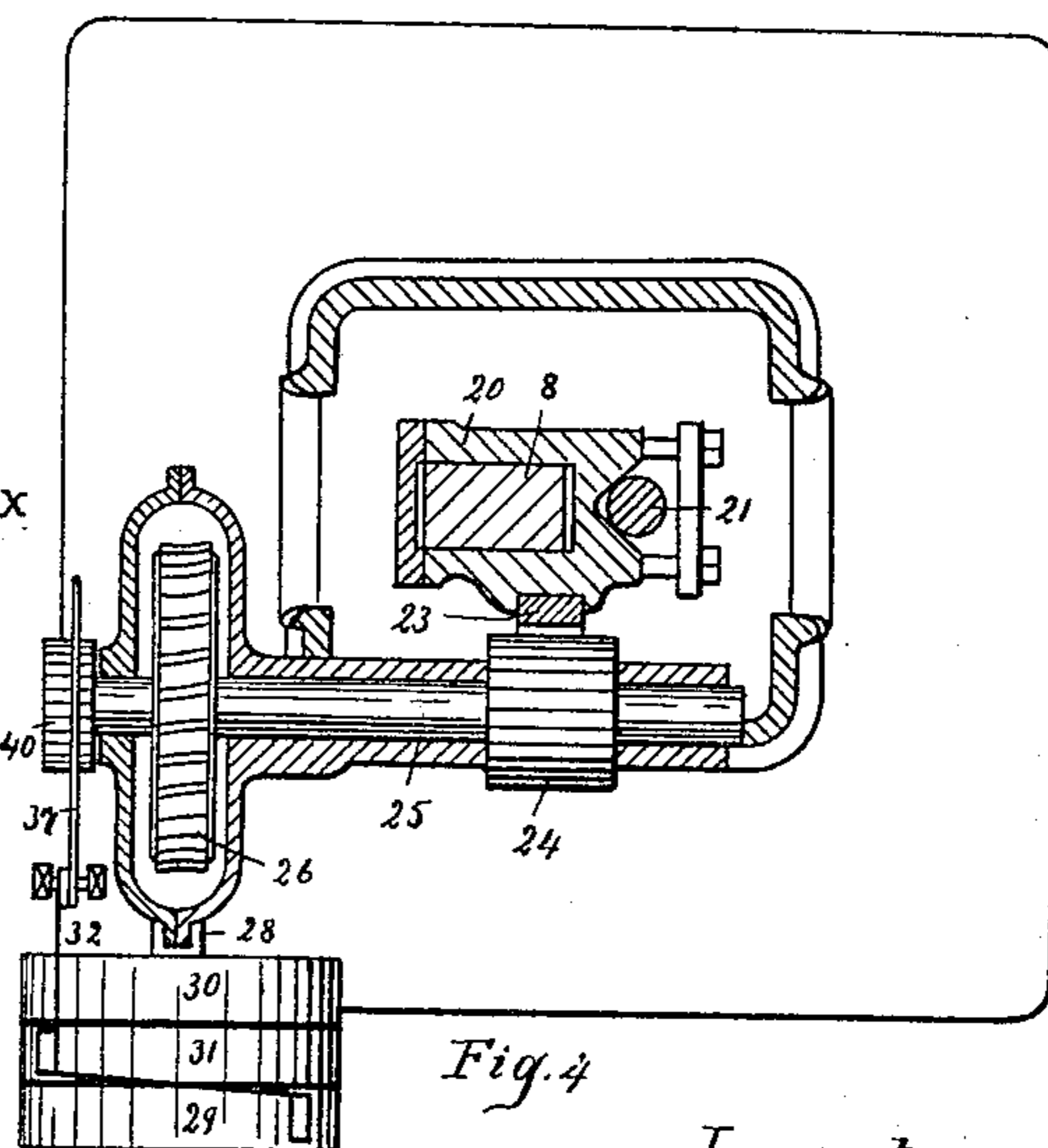
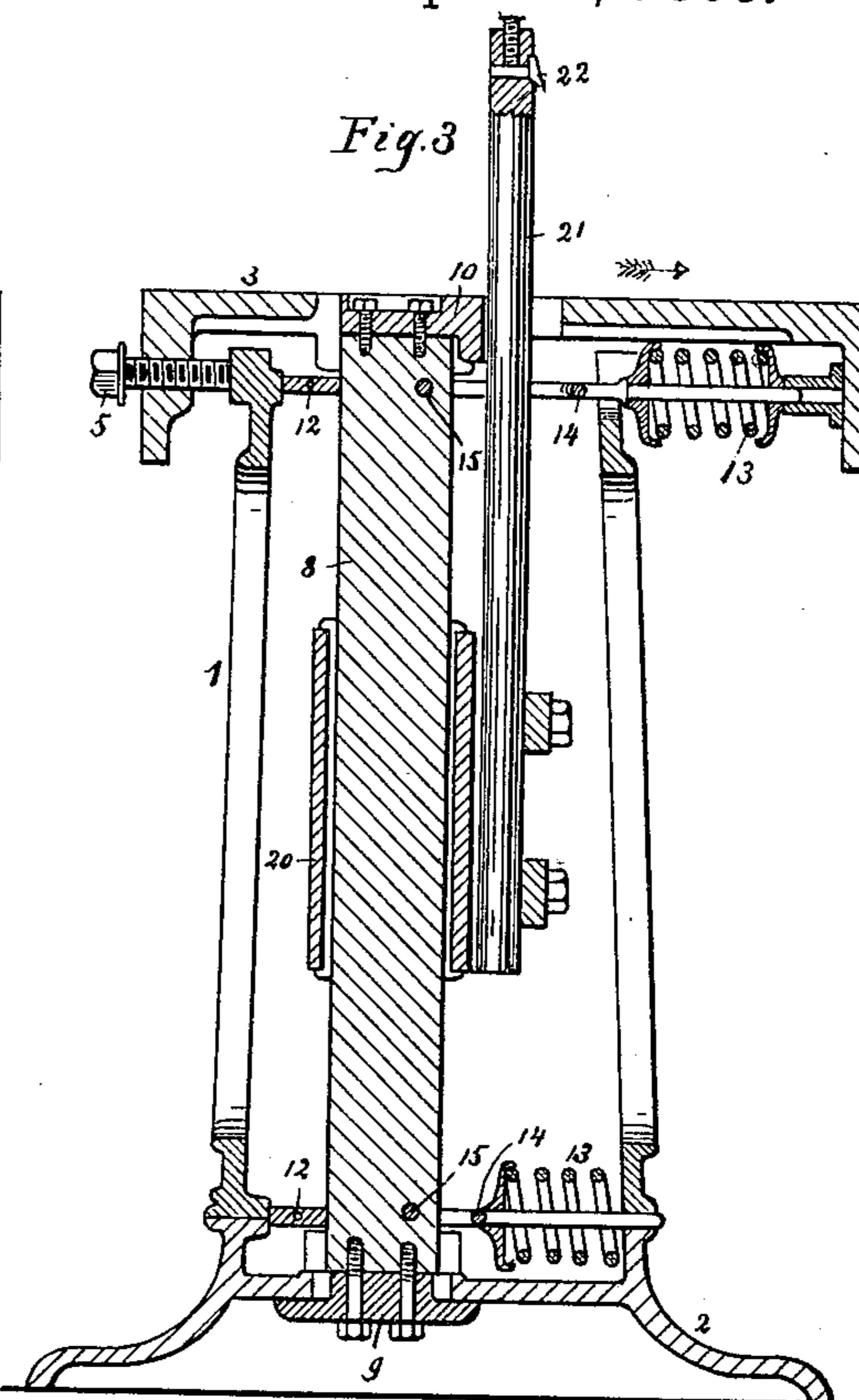


2 Sheets—Sheet 1.

No. 389,243.

Patented Sept. 11, 1888.



Attest:

John Schuman.  
J. Whittemore.

Inventors:

Randall A. Palmer,  
and  
John E. Palethorp.  
By Thos. S. Sprague & Son.  
Atty

(No Model.)

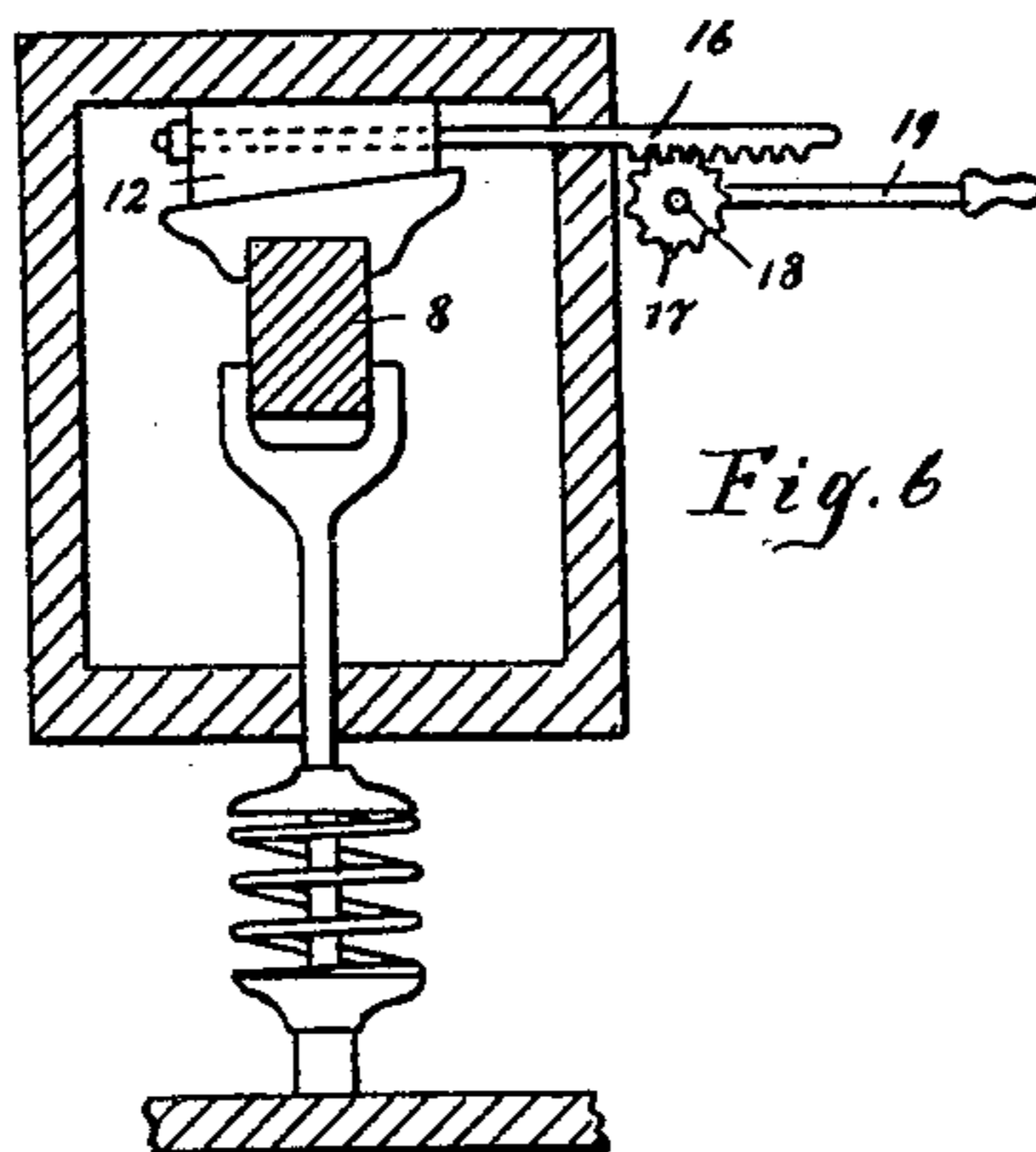
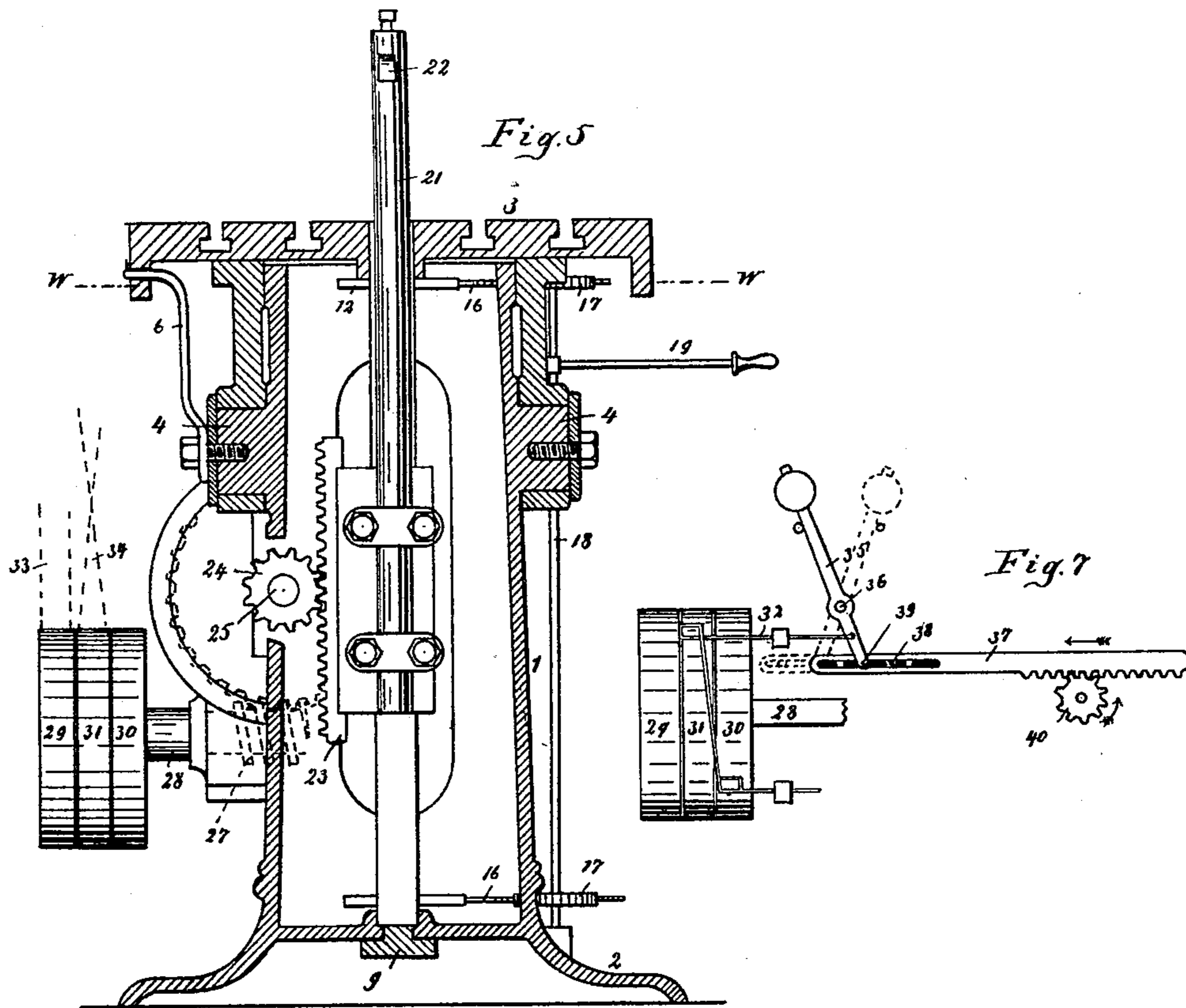
2 Sheets—Sheet 2.

R. A. PALMER & J. E. PALETHORP.

KEY SEAT CUTTING MACHINE.

No. 389,243.

Patented Sept. 11, 1888.



Attest:  
John Schuman.  
Jas. Whittemore.

Inventors:  
Randall A. Palmer,  
and  
John E. Palethorp.  
By Thos. S. Sprague & Son.  
Atty

# UNITED STATES PATENT OFFICE.

RANDALL A. PALMER, OF EAST SAGINAW, AND JOHN E. PALETHORP, OF  
PORT HURON, MICHIGAN.

## KEY-SEAT-CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 389,243, dated September 11, 1888.

Application filed February 2, 1888. Serial No. 262,713. (No model.)

*To all whom it may concern:*

Be it known that we, RANDALL A. PALMER and JOHN E. PALETHORP, citizens of the United States, residing, respectively, at East Saginaw, in the county of Saginaw, and Port Huron, county of St. Clair, State of Michigan, have invented certain new and useful Improvements in Key-Seating Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to new and useful improvements in machines for making key-seats and other analogous work; and the invention consists in the peculiar construction, arrangement, and combination of the different parts, all as more fully hereinafter described, and specifically set forth in the claims.

In the drawings which accompany this specification, Figure 1 is a side elevation of our improved machine. Fig. 2 is a plan thereof. Fig. 3 is a vertical section on line *x x* in Fig. 2. Fig. 4 is a horizontal section on line *y y* in Fig. 1. Fig. 5 is a vertical section on line *z z*, Fig. 2. Fig. 6 is a horizontal section on line *w w*, Fig. 5. Fig. 7 is a diagram showing the means for obtaining the reciprocation of the cutter-bar.

1 is a suitable supporting frame or column, resting on a suitable foot, 2, and carrying a tilting table, 3, supported on the trunnions 4 on the frame, said table being firmly secured in any desired position by means of binding-screws 5, or in any other suitable manner. To indicate the angle to which such table is adjusted, an index-finger, 6, is secured to the column and extends through a slot, 7, in the side of the table, which is provided with a graduated arc to read off the angle of inclination.

8 is a movable guide supported in a vertical position in the center of the column, or nearly so, and adapted to be pushed bodily parallel to itself in the direction indicated by the arrows in Fig. 3. To this end the movable guide is secured at its lower end with a sliding step, 9, near the bottom of the column, and its upper free end is secured to a block, 10, which slidingly engages with a slot, 11, in the table. The parallel movement of the guide backward or forward is produced by means of the slid-

ing wedges 12, interposed at one side between the frame and the guide, near the top and bottom thereof, and by means of the springs which actuate the tension rods 14, which are secured to the guide at 15 upon one opposite side from the wedges. The sliding wedges 12 are constructed to operate together, for which purpose they are provided with the rack-bar 16, which engages with the pinion 17 on the vertical shaft 18, as shown in Fig. 6. By means of the lever 19, secured to the shaft 18, the operator then may simultaneously operate the wedges by pushing the bar 8 backward or forward parallel with itself.

20 is a sliding tool-holder arranged to reciprocate upon the guide 8, and to this tool-holder is vertically adjustably secured in any suitable manner the cutter-bar 21, which projects through the slot 11 in the top of the table, and carries a suitable cutting-tool, 22, for cutting the key-seats. The reciprocation of the tool-holder 20 is obtained in the following manner:

23 is a rack-bar secured to one side of the tool-holder. 24 is a pinion engaging therewith. 25 is a shaft on which said pinion is secured. 26 is a worm-gear secured upon the shaft 25.

27 is a worm secured upon a shaft, 28. 29 and 30 are two loose pulleys upon the shaft 28.

31 is a pulley fast upon the shaft 28, between the pulleys 29 and 30.

32 is a belt-shifter, which guides the straight belt 33 and the cross-belt 34.

35 is a weighted lever, fulcrumed at 36 and connected to the belt shifter.

37 is a rack-bar provided with the slot 38, into which a suitable pin, 39, on the lever 35 engages.

40 is a pinion on the shaft 25, into which the rack-bar 37 engages.

The parts being constructed and arranged as shown and described, the belt 33, engaging with the fast pulley 31, transmits its motion through the shaft 28 and worm-wheel 27 to the worm-gear 26 on the shaft 25. The pinion 40 is thus revolved with the shaft 25, and carries the motion to the rack-bar 37, which, by means of its connection with the weighted lever 35 after a certain position in its travel, will os-

cillate the lever, which, as soon as brought past its perpendicular position, falls into the position shown in dotted lines, and by this combined movement the belt-shifter 32 is designed to bring the straight belt 33 onto the loose pulley 29, while the cross belt 34 passes onto the fast pulley 31, thereby reversing the motion. Thus the shaft 25 is alternately revolved in one direction or the opposite, thereby imparting a reciprocating movement to the tool-holder 20, which carries the cutter-bar and cutter. The work is upon the table 3, which for this purpose may be provided with suitable mortises to receive bench dogs or clamps to secure the work in the well-known manner, and by inclining the table to any desired degree the key-seat may be cut to any taper desired. To prevent the cutter-bar from springing, the plate 10 at the upper end of the guide-bar is preferably provided with the V-shaped bearing 41, against which the cutter-bar rests. As the work of the cutter-bar progresses the operator feeds the cutter up to its work at every reciprocation by means of the lever 19, which may be provided with suitable attachments. To control the feeding and to keep the rack-bar 23 in engagement with the pinion 24, the latter is made sufficiently long to keep the parts in engagement.

What we claim as our invention is—

1. In a key-seating machine, the combination of the following elements: the frame or column, the table supported thereon, the vertical guide-bar supported in laterally-sliding bearings, the devices for pushing said bar laterally, and the reciprocating tool-holder slidably secured upon the vertical guide and carrying the cutter-bar and cutter, substantially as described.

2. In a key-seating machine, the combination of the following elements: a supporting frame or column, a table supported on trunnions, means for adjusting that table to different inclines, a guide-bar secured in sliding bearings in the frame, means for adjusting that guide-bar laterally parallel with itself, and a reciprocating tool holder upon that guide-bar and carrying a cutter and cutter-bar, substantially as described.

3. In a key-seating machine, the combination, with the frame and table thereof, of a vertical guide-bar supported in laterally-sliding bearings therein and carrying the reciprocating cutter, of coacting sliding wedges arranged to bear against one side of the guide-bar, and of springs adapted to bear against the opposite side of the guide-bar, whereby the movement of the wedges produces a lateral movement of the guide-bar, substantially as described.

4. In a key-seating machine, the combination, with the frame and table, of the vertical guide-bar 8, the sliding step 9, secured to the lower end of said guide-bar, the bearing-plate 10, secured to the upper end of the guide-bar and slidably engaging in the slot 11 in the table, the sliding wedges 12, and the tension-rods 14, carrying the springs 13, all arranged to operate substantially as described.

5. In a key-seating machine, the combination, with the frame and the table adjustably supported on trunnions thereon, of the vertical guide-bar 8, supported in laterally-sliding bearings and carrying the cutter, the sliding wedges 12, the rack-bars 16, carrying these wedges, the pinions 17, the shaft 18, the lever 19, the trunnion-rods 14, and the springs 13, all the parts being arranged to operate substantially as described.

6. In a key-seating machine, the combination, with the vertical guide-bar 8, of the vertically-reciprocating tool-holder 20, carrying the cutter-bar, the rack 23, secured to the tool-holder, the pinion 24, engaging into said rack, the shaft 25, the worm-gear 26, the worm 27, the shaft 28, the loose pulleys 29 30, fast pulley 31 on said shaft, and the straight and cross belts for alternately transmitting motion thereto through the operation of the belt-shifting device, substantially as described.

In testimony whereof we affix our signatures, in presence of two witnesses, this 27th day of December, 1887.

RANDALL A. PALMER.  
JOHN E. PALETHORP.

Witnesses:

CAS STEWART,  
JUDSON E. KING.