

No. 679,675.

Patented July 30, 1901.

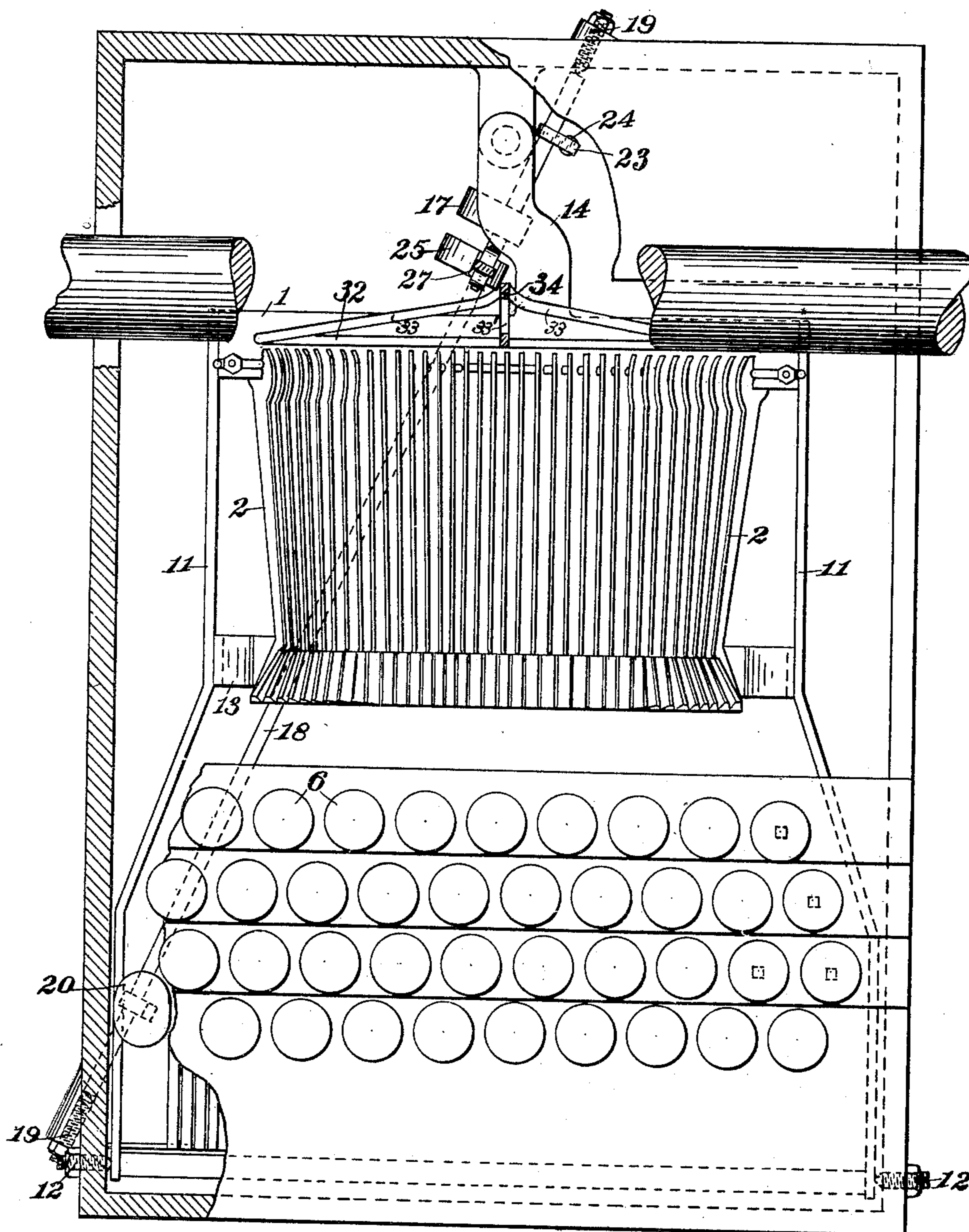
E. B. HESS.
WRITING MACHINE.

(No Model.)

(Application filed May 13, 1901.)

3 Sheets—Sheet 1.

Fig. 1.



Witnesses
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3 Sheets—Sheet 2.

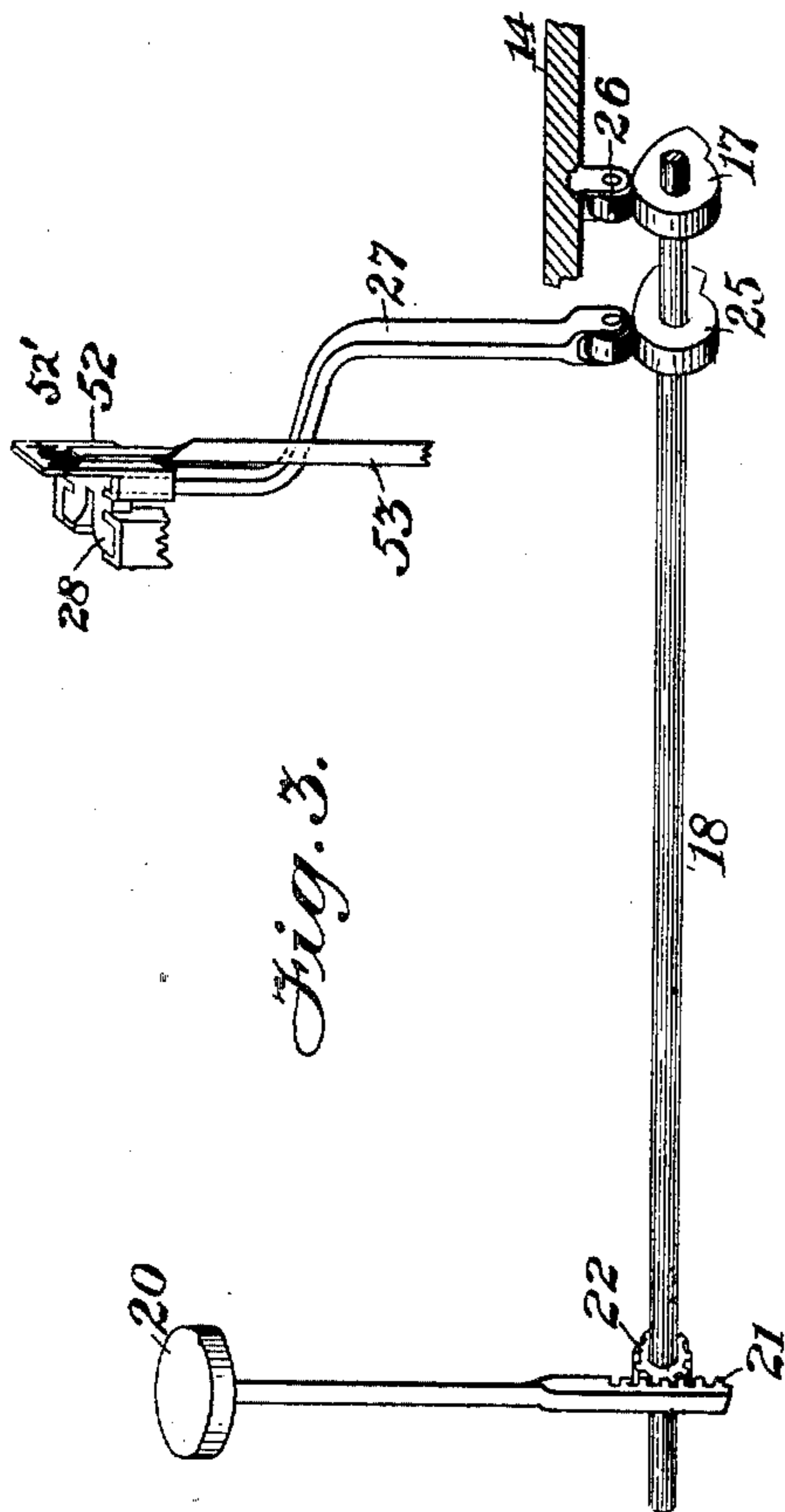


Fig. 3.

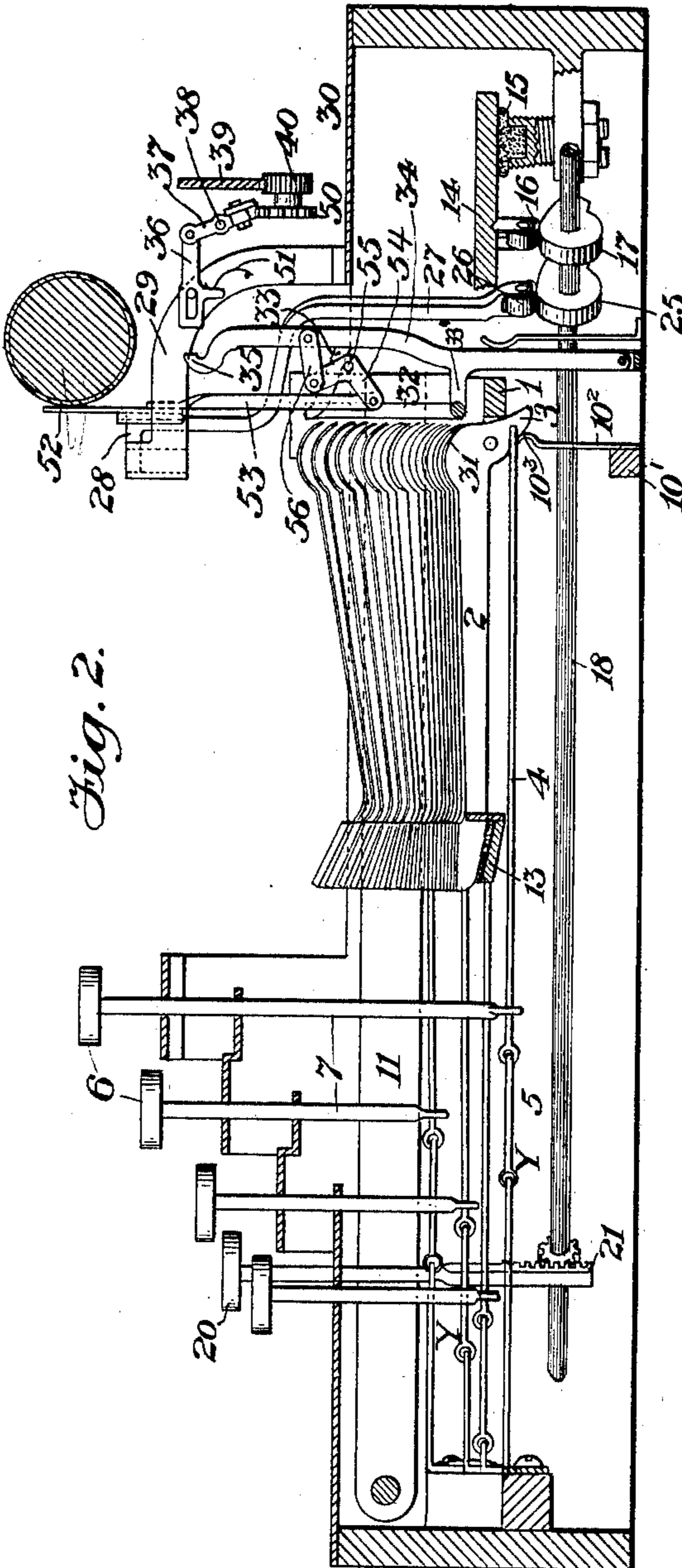


Fig. 2.

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3 Sheets—Sheet 3.

Fig. 5.

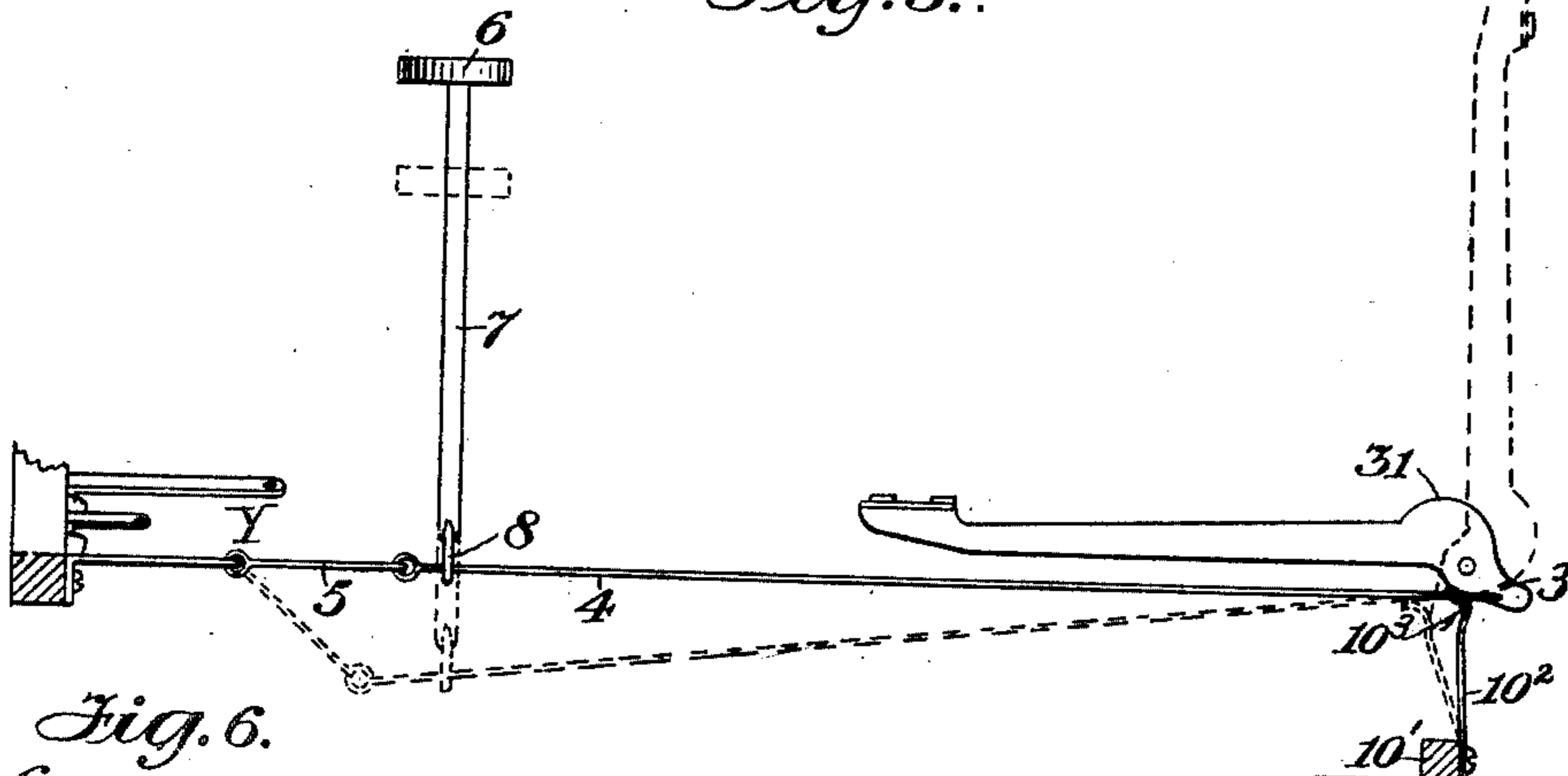


Fig. 6.

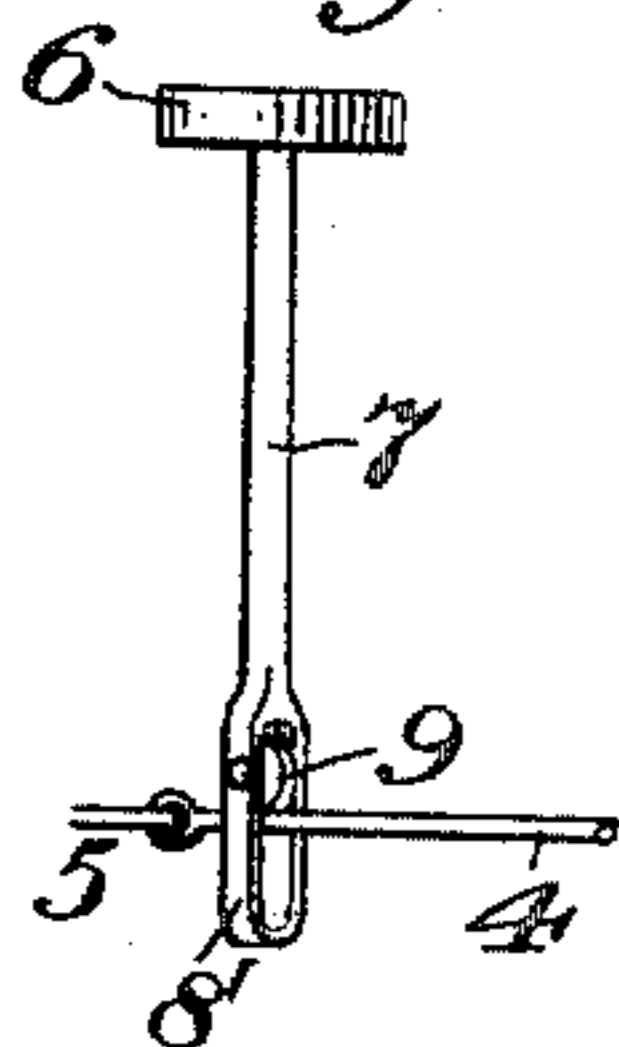


Fig. 7.

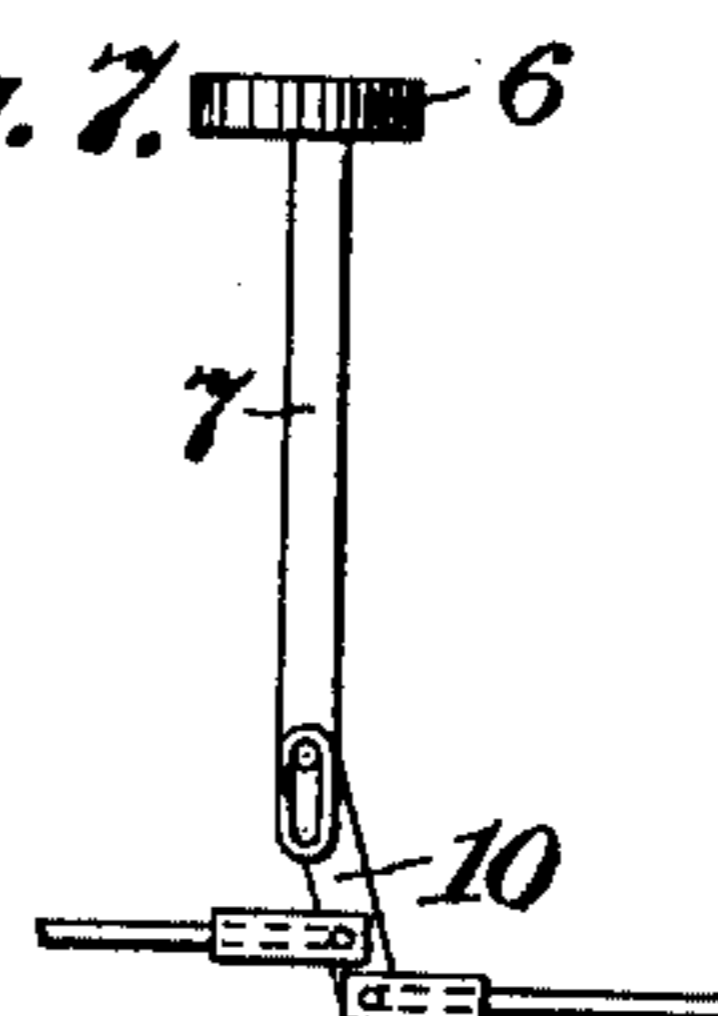
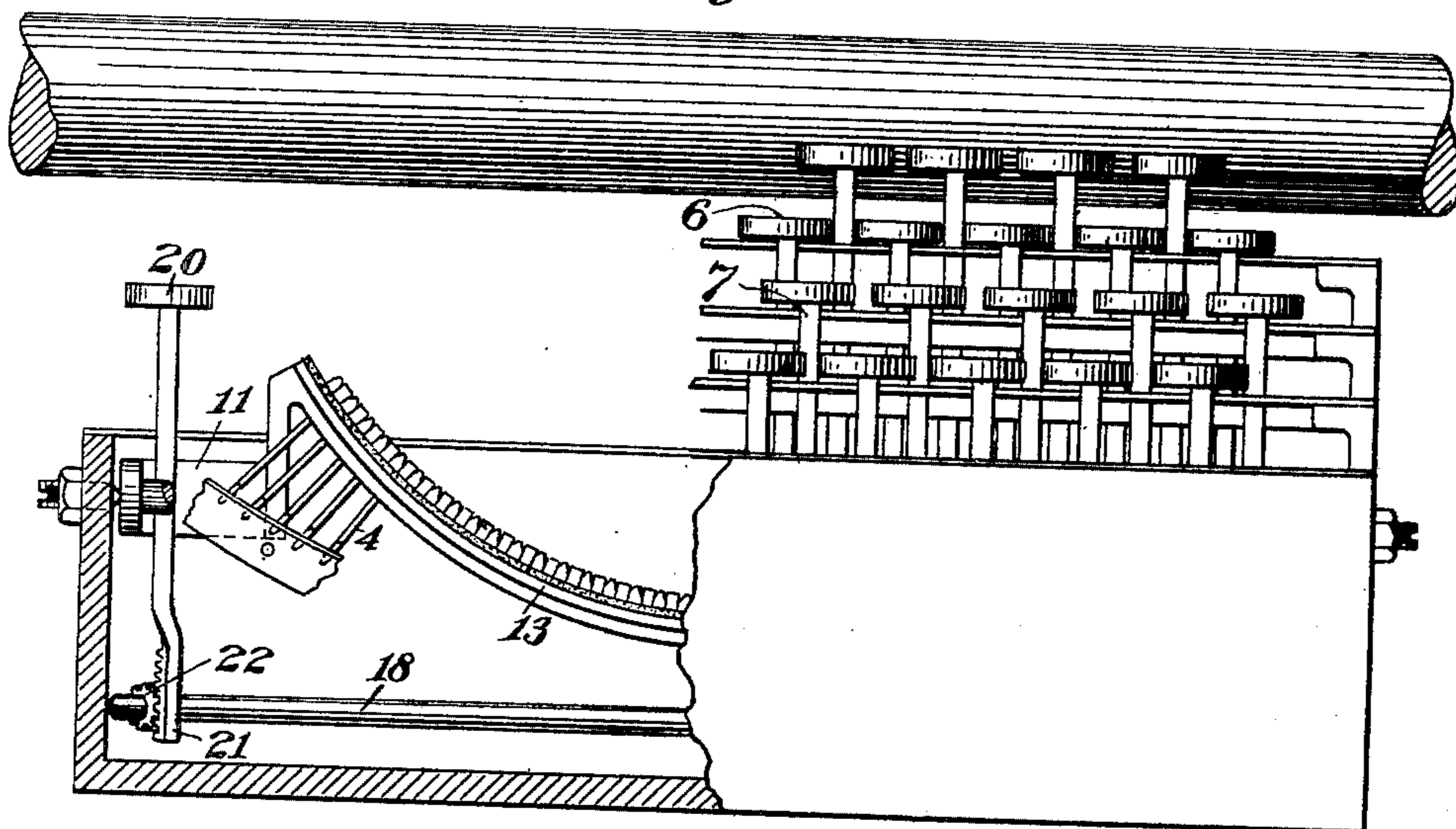


Fig. 4.



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UNITED STATES PATENT OFFICE.

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WRITING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 679,675, dated July 30, 1901.

Application filed May 13, 1901. Serial No. 59,949. (No model.)

To all whom it may concern:

Be it known that I, EDWARD B. HESS, a citizen of the United States, and a resident of the borough of Brooklyn, city of New York, State of New York, have invented certain new and useful Improvements in Writing-Machines, of which the following is a specification.

This invention relates to a type-bar-actuating mechanism or movement and associated parts of the machine relating to a shifting type-bar support for upper or lower case printing, a universal-bar organization, and a movable type-bar guide, combined with a vibrating or reciprocating ribbon-carrier, all as hereinafter set forth in detail.

In the accompanying drawings so much only of the machine has been illustrated as seems desirable to disclose the several features of the invention.

The drawings show a front-stroke machine constructed and organized in a manner deemed by me to be an efficient and desirable form in which the invention may be embodied. The invention, however, is applicable wholly or in part to machines other than so-called "front-stroke" machines and may be embodied in other forms than the special construction illustrated.

Figure 1 is a plan view, partly broken away and partly in section; Fig. 2, a central vertical longitudinal section; Fig. 3, a detail perspective view of the shift-key and associated parts; Fig. 4, a front view, partly broken away; Fig. 5, a detail view showing the type-bar-actuating mechanism; Figs. 6 and 7, detail views showing modified ways of flexing the connections that actuate the type-bars.

The type-bar-actuating mechanism will first be described.

In an application for Letters Patent of the United States filed by me April 26, 1901, Serial No. 57,588, is shown a type-bar-actuating mechanism of a construction and mode of operation similar to that herein shown and upon which this part of my present invention constitutes an improvement. In the segment or support 1 the type-bars 2 are pivoted, as shown, or otherwise. They normally lie substantially horizontally toward the front of the machine and are adapted to strike upon the front face of the platen. From the heel or

projection 3 on each type-bar beyond its pivot a flexing connection extends forward under the type-bars and is hinged to a fixed point Y. As shown, this connection consists of two links 4 5, united at their adjacent ends by a hinge-joint and respectively connected at their opposite ends to the type-bar at 3 and the fixed point Y. The flexing connection may, however, be embodied in other forms. The flexing connection is so disposed that its point of flexure will lie in or below or beyond a straight line connecting the fixed point Y and the point of attachment of the opposite or rear end of the connection, so that when the connection is flexed, as indicated by the dotted lines in Fig. 5, its parts respectively in front and rear of the point of flexure will be subjected to tensile strain and the type-bar thrown to the printing-point by a pull.

The finger-pieces 6 are in the construction shown connected with the type-bar-operating flexing connection by the vertically-movable stem 7. As seen in Fig. 5, an eye 8 at the end of the stem embraces the link 4 adjacent the hinge connection with the link 5. Fig. 6 shows a similar arrangement, except that a roller 9, having bearings in the sides of the loop 8', runs upon the link 4, and between the bottom of the roller and the bottom of the slot there is a space materially greater in depth than the thickness of the wire or link 4. In Fig. 7 the lower end of the stem 7 is slotted to receive a pin on the upper end of a link 10, to the lower end of which the links 4 5 are hinged or swiveled. In Fig. 5 on the depression of the finger-piece the connection between the fixed point and the type-bar is flexed on its hinge-joint, the link 4 sliding in the eye 8. The type-bar is therefore thrown by a pull to the printing-point. This construction, as well as the modified forms shown in Figs. 6 and 7, is characterized by a minimum resistance to the depression of the finger-piece and a minimum velocity of the type as it is put into motion, the resistance of the finger-piece and the velocity of the type-bar increasing during the excursion of the latter to the printing-point. In the construction shown in Fig. 6 the operation may be in all respects the same as that of the construction shown in Fig. 5. It may have, however, a

somewhat different mode of operation. In Fig. 5 it is necessary to depress the finger-piece to the full extent, whereas in Fig. 6 if a quick impulse of depression of sufficient power be initially imparted to the finger-piece the type-bar may be thrown to the printing-point in advance of the complete depression of the key, which latter may be unnecessary. The free way or margin of motion in the bottom of the loop 8' will permit the descent of the link 5 in advance of the further depression of the finger-piece and its stem. In the construction shown in Fig. 7 a similar operation may occur. In this figure on the depression of the finger-piece the link 10 is forced down and its lower end will swing to the left or the front of the machine, following the arc or curve which the front portion of the flexing connection or the link 5 describes around the fixed point which is its center of motion. The employment of a link 10, having this general mode of operation, but without the loose or pin-and-slot connection with the stem 7 or other part actuated by the finger-piece, is described and claimed in an application filed May 13, 1901, Serial No. 59,948, by me jointly with Joseph M. Stoughton.

Owing to the construction and arrangement of the type-bar-actuating devices and their permissible lightness, the weight of the type-bar may be so regulated that it will return to its normal position by rebound and gravity. I prefer, however, to employ a relatively light spring to seat the type-bar against its back-stop, and in the construction shown I employ a spring so related to the type-bar as to accomplish this result and also accelerate its retreat from the platen. Below the type-bars, on a cross-piece 10', is mounted a series of bar or finger springs 10², preferably bent to a curve 10³ at their upper ends, with the convex face of the curve bearing against the edge of the type-bar projection 3, all as shown in Figs. 2 and 5. As shown in Fig. 5, the curved end of the spring bears normally upon the edge of the type-bar adjacent to and substantially just below the type-bar pivot. As the type-bar moves toward the platen the spring is displaced by the edge of the type-bar projection 3 rocking against it until finally the lower end of that projection rests against the spring at the lower part of its curved end 10³. The point of contact between the spring and the projection 3 is then at a considerably-greater distance from the pivot of the type-bar. The reaction of the spring upon the type-bar is therefore increased to a maximum at the moment of impact of the type-bar upon the platen and a quick or accelerated initial return movement of the type-bar to normal position results.

The type-bar segment 1 forms the rear cross-bar of a horizontally-disposed frame, of which 11 11 are the side bars and which is pivoted at or toward the front end of the machine upon pivot-screws 12 or otherwise. The back-

stop or rest, upon which the type-bars normally lie, also constitutes a cross-bar of this rocking frame. An arm 14 projects rearwardly from the type-bar segment and normally rests upon an adjustable buffer or stop 15. On the under face thereof is a projection—preferably a roll 16—having bearings in suitable lugs and lying normally in contact with or in close juxtaposition to a cam 17 on a rock-shaft 18, extending diagonally from the front left-hand corner of the machine to the rear thereof and somewhat to the right of the center line of the machine. This shaft has bearings on bearing-screws 19 19.

20 is the shift-key, whose vertical movable stem is formed at its lower end with a rack 21, engaging a pinion 22 on the rock-shaft 18. When the key is depressed, the shaft is partially rotated and the cam 17 lifts the rocking frame and segment 1 to change the relation of the type-bars to the printing-point. This movement is limited by a radial arm 23 coming against a stop-post 24. On the release of the shift-key the rocking frame and type-bar segment drop by gravity to the normal position. On the shaft 18 in rear of the type-bar segment and adjacent the cam 17 is another cam 25, upon which normally rests a roller 26 in the lower end of the standard or stem 27 of a type-bar guide 28, sliding vertically in ways in the end of an arm or bracket 29, suitably mounted upon the machine on the rear top plate 30 or otherwise. The relative pitch of the cams 25 and 17 is such that when the shaft 18 is rocked by the depression of the shift-key the type-bar guide is first raised, and after it the segment 1 is raised. The work of performing these two operations is therefore apportioned to different stages of depression of the shift-key, making its touch lighter and in the special construction shown of greater resistance during the final than during the initial stage of depression. By employing an angularly-disposed shaft for shifting the segment and guide a material reduction in the number of parts ordinarily requisite is obtained and the machine is correspondingly simplified in construction and the cost of manufacture reduced. The rack-and-pinion arrangement for actuating the shaft is merely illustrative of one way of accomplishing that result. Many other ways will readily occur to those skilled in the art. The type-bars are formed adjacent their pivots with a cam projection or edge 31, and immediately in rear of these cam-faces is located a segmental rod or universal bar 32, connected at its ends by parts 33 and at its center by a part 33' with a vertical arm 34, pivotally mounted at its lower end, and its upper end 35 terminating suitably adjacent and opposite the front end of a slide 36, at the rear end of which is hinged an escapement latch or pawl 37, pivoted at 38. 39 is the rack, 40 the pinion engaging it, and 50 the escapement-wheel.

A spring 51 normally presses the slide 36 forward. When a type-bar is thrown to the

printing-point, its cam-surface 31 presses the segmental bar 32 rearwardly and the end 35 of the pivoted standard 34 strikes the slide 36 and effects the feed of the carriage. In rear
 5 of the type-bar guide 28 is mounted to slide, as shown in Fig. 3, a vibrating or reciprocating ribbon-carrier 52. The vertical arm 53, to which it is attached, is connected at its lower end to one arm of a bell-crank lever 54,
 10 pivoted at 55, and the other arm of which is connected by a link 56 with the standard of the universal bar 34. As therefore the universal bar is vibrated back and forth the ribbon-carrier is vibrated or reciprocated verti-
 15 cally to cover the printing-point at the time of impact of the type and to drop away therefrom as the type-bar recedes from the platen.

The ribbon-carrier 52 is merely a plate having a central opening through which the type
 20 strike and slots 52' at each side through which the ribbon is threaded.

The broad subject-matter comprising a flexing connection extending between the part or type-bar to be actuated and a fixed
 25 point, whether such connection be composed of jointed links or otherwise, and means for flexing the connection, whatever they may be, is claimed in my prior application, filed April 26, 1901. The subject-matter herein
 30 shown is subordinate to said prior application, and the claims herein are limited to features of construction not shown in said prior application.

I claim as my invention—

35 1. In a writing-machine, the combination of a part to be actuated, a flexing connection, acting substantially as described, connected at one end to said part and at the other end to a fixed point, a finger-piece, and a device
 40 having sliding connection with said flexing connection intermediate its ends and actuated on the depression of the finger-piece to flex said connection.

2. In a writing-machine, the combination
 45 of a part to be actuated, a flexing connection, comprising links united by a hinge-joint and acting substantially as described, connected at one end to said part and at the other end to a fixed point, a finger-piece, and a device
 50 having sliding connection with said flexing connection intermediate its ends and actuated on the depression of the finger-piece to flex said connection.

3. In a writing-machine, the combination
 55 of a pivoted type-bar, a flexing connection connected at one end to the type-bar and at the other end to a fixed point, a finger-piece, and a device having sliding connection intermediate its ends with said flexing connection and actuated on the depression of the
 60 finger-piece to flex said connection.

4. In a writing-machine, the combination
 65 of a pivoted type-bar, a flexing connection comprising links united by a hinge-joint connected at one end to the type-bar and at the other end to a fixed point, a finger-piece, and a device having sliding connection with said

flexing connection intermediate its ends and actuated on the depression of the finger-piece to flex said connection. 70

5. In a writing-machine, the combination of a pivoted type-bar, a flexing connection connected at one end to the type-bar and at the other end to a fixed point, a finger-piece, and a device having a sliding loose or slot
 75 connection with said flexing connection intermediate its ends and actuated on the depression of the finger-piece, whereby on imparting a flexing impulse to said flexing connection it may move in advance of the device
 80 that actuates it.

6. In a writing-machine, the combination of a platen, a type-bar segment, means for varying the relation of the segment and platen, type-bars in the segment, flexing connec-
 85 tions acting substantially as described connected to the type-bars and to fixed points, finger-pieces and devices actuated by the finger-pieces and having sliding connection with said flexing connections intermediate their
 90 ends.

7. In a writing-machine, the combination of a platen, a type-bar segment, means for varying the relation of the segment and platen, type-bars in the segment, flexing connec-
 95 tions comprising links united by a hinge-joint and acting substantially as described connected to the type-bars and to fixed points, finger-pieces and devices actuated by the finger-pieces and having sliding connection
 100 with said flexing connections intermediate their ends.

8. In a writing-machine, the combination of a platen, a type-bar segment, means for changing the relation between the segment
 105 and platen, type-bars pivoted in the segment and normally lying toward the front of the machine, flexing connections located under the type-bars, and connected thereto and also connected to fixed points, a series of finger-
 110 pieces arranged above the flexing connections and in front of the type-bars and a series of devices actuated by the finger-pieces and having sliding loose or slot connection with said flexing connections intermediate their
 115 ends, whereby on imparting an impulse of depression to a finger-piece to flex the connection, the flexing connection may move in advance of the device that actuates it.

9. In a writing-machine, the combination
 120 of a pivoted type-bar having a projection beyond its pivot, a spring normally bearing thereon, the relation of the spring and projection being such that as the type-bar is rocked upon its pivot the point of contact be-
 125 tween it and the spring is moved farther from the axis of the type-bar and means for actuating the type-bar.

10. In a writing-machine, the combination
 130 of a pivoted type-bar having a projection beyond its pivot, a spring normally bearing thereon, the relation of the spring and projection being such that as the type-bar is rocked upon its pivot the point of contact be-

tween it and the spring is moved farther from the axis of the type-bar and a flexing connection connected at one end to said projection and at the other end to the fixed point
5 and means for flexing said connection applied thereto intermediate its ends to throw the type-bar to the printing-point with a pull.

11. In a writing-machine, the combination of a platen, a type-bar segment, means for
10 moving the segment relatively to the platen, type-bars pivoted in the segment and having extensions beyond their pivots, springs bearing against said projections and so related thereto that as the type-bar turns about its
15 pivot the distance from the pivot of the point of contact of the spring is increased, flexing connections acting substantially as described connected with the type-bars and fixed points and means operating upon such flexing con-
20 nections intermediate their ends to flex them and throw the type-bars to the printing-point with a pull.

12. In a writing-machine, the combination of a horizontally-disposed rocking frame, a
25 type-bar segment forming part thereof, type-bars pivoted therein, finger-pieces, means for operating the type-bars, a shift-key, a rock-shaft actuated thereby and extending diagonally from the shift-key to the rear of the
30 machine and under the rear end of the rocking frame and a cam on the rock-shaft controlling the elevation of the rear end of the rocking frame.

13. In a writing-machine, the combination
35 of a horizontally-disposed rocking frame, a type-bar segment forming part thereof, type-bars pivoted therein, finger-pieces, means for operating the type-bars, a shift-key, a rock-shaft actuated thereby and extending diagonally from the shift-key to the rear of the
40 machine and under the rear end of the rocking frame and a cam on the rock-shaft controlling the elevation of the rear end of the rocking frame, a second cam on the rock-shaft, a movable type-bar guide supported on
45 said cam whereby on the actuation of the rock-shaft the position of the guide is changed.

14. In a writing-machine, the combination of the movable type-bar segment, type-bars
50 pivoted therein and means for operating them, the movable type-bar guide, the universal bar actuated by the type-bars, a vibrating ribbon-carrier actuated by the universal bar, a shift-key, and operative connections between it
55 and the segment and guide whereby on the depression of the key the guide is first shifted and then the segment.

15. In a writing-machine, the combination of the movable type-bar segment, type-bars

pivoted therein and means for operating them, 60
a movable type-bar guide, the bracket or support on which it is mounted, a vibrating ribbon-carrier also mounted on said support, a shift-key, operative connections by which on
65 the depression of the shift-key the guide is first shifted and then the segment, a vibrating universal bar, and operative connections between it and the vibrating ribbon-carrier.

16. In a writing-machine, the combination of a type-bar segment, type-bars pivoted
70 therein and having cam portions 31 adjacent their pivots, a universal bar actuated by such cam portions, flexing type-bar-actuating connections connected at their rear ends to the type-bars and at their front ends to fixed
75 points, and means for acting upon such connections intermediate their ends to throw the type-bars to the printing-point.

17. In a writing-machine, the combination of a type-bar segment, type-bars pivoted
80 therein and having cam portions 31 adjacent their pivots, a universal bar actuated by such cam portions, a vibrating ribbon-carrier actuated by the universal bar, flexing type-bar-actuating connections connected at their rear
85 ends to the type-bars and at their front ends to fixed points, and means for acting upon such connections intermediate their ends to throw the type-bars to the printing-point.

18. In a writing-machine, the combination
90 of a type-bar segment, type-bars pivoted therein and having cam portions 31 adjacent their pivots, a universal bar actuated by such cam portions, a vibrating ribbon-carrier actuated by the universal bar, means for shift-
95 ing the segment, flexing type-bar-actuating connections connected at their rear ends to the type-bars and at their front ends to fixed points, and means for acting upon such connections intermediate their ends to throw the
100 type-bars to the printing-point.

19. In a writing-machine, the combination of a type-bar segment, type-bars pivoted
105 therein and having cam portions 31 adjacent their pivots, a universal bar actuated by such cam portions, a vibrating ribbon-carrier actuated by the universal bar, a type-bar guide, means for shifting the guide and segment, flexing connections for operating the type-
110 bars, and means for acting upon such connections intermediate their ends to throw the type-bars to the printing-point.

In testimony whereof I have hereunto subscribed by name.

EDWARD B. HESS.

Witnesses:

V. L. NELSON,
R. L. HAWES.