No. 637,335. Patented Nov. 21, 1899.

E. B. HESS & J. M. STOUGHTON.

TYPE WRITING MACHINE.

(Application filed Feb. 27, 1899.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

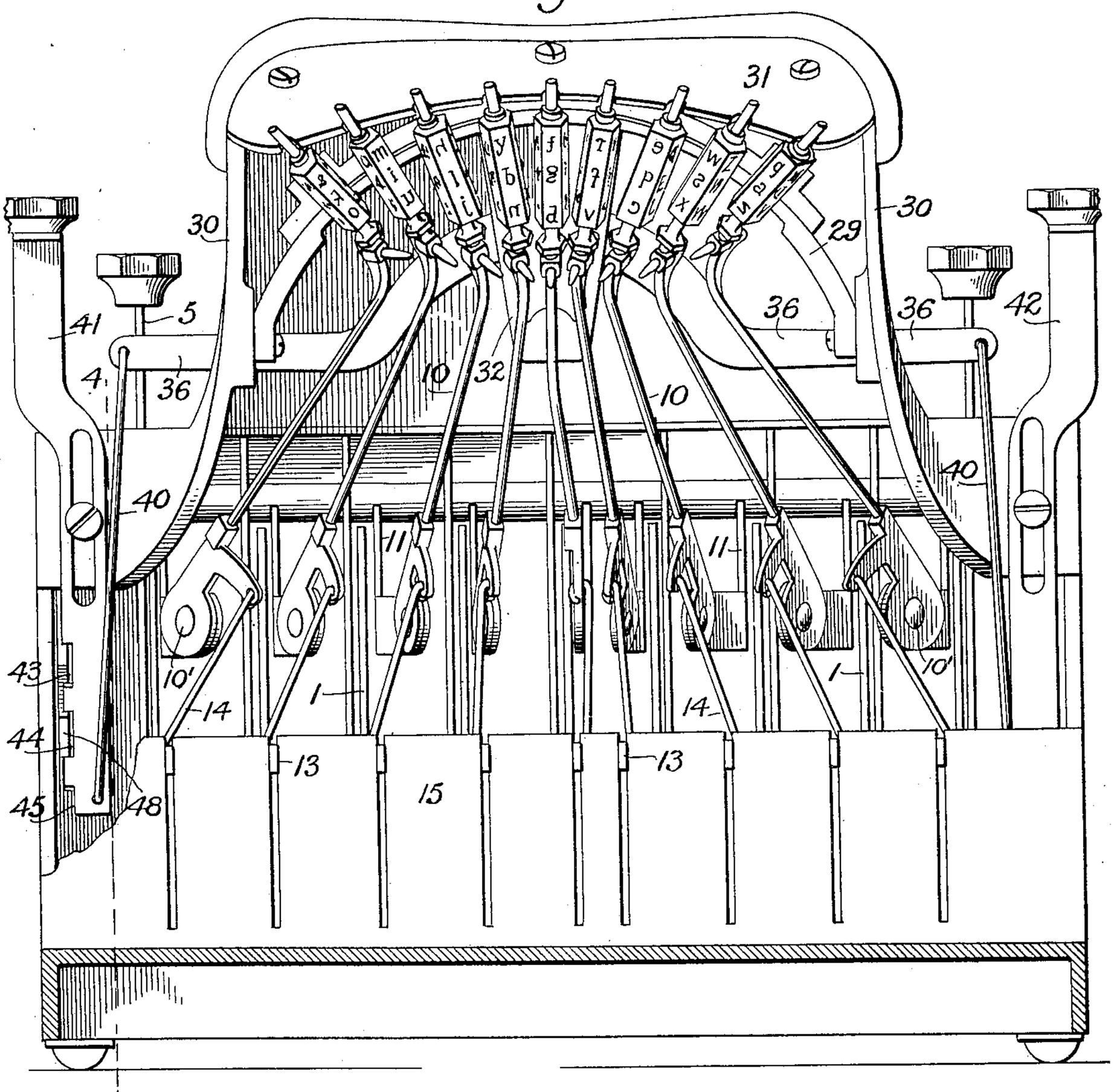
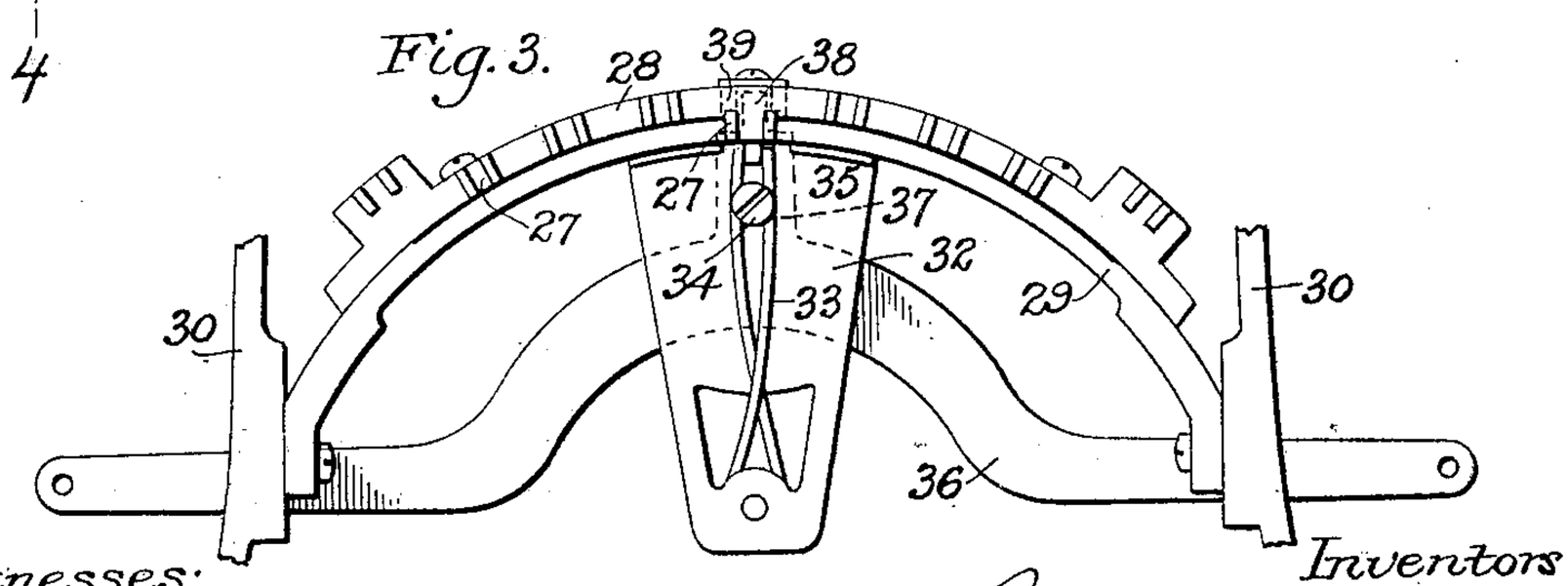


Fig. 3.



Witnesses:
C. D. Ladley.
James F. Oliphant.

Inventors
Edward B. Hess
Joseph M. Stoughton
by their attorneys
Baldwin, Davidson & Wright

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(No Model.) 2 Sheets—Sheet 2.

Fig. 2.

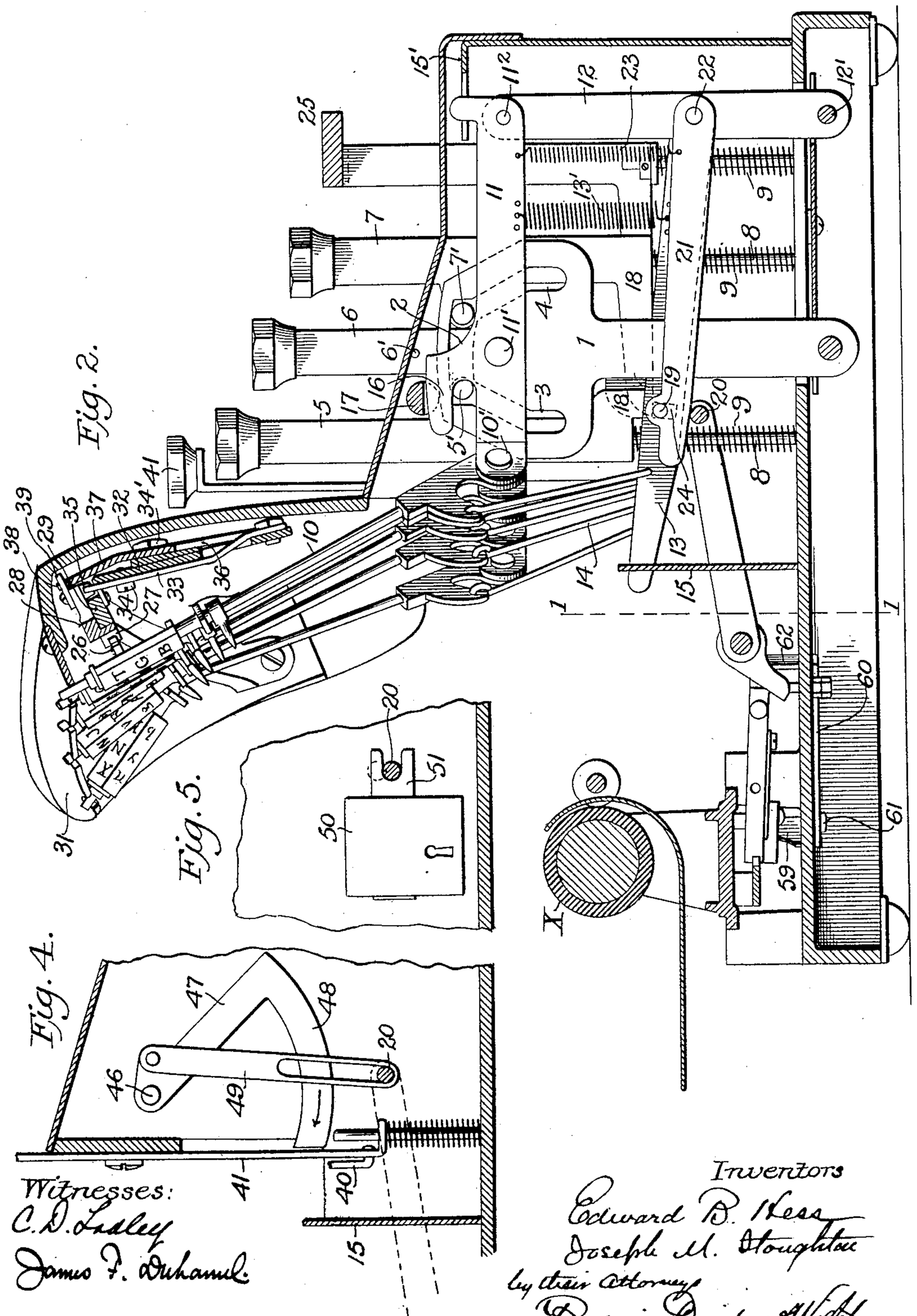

Fig. 5.

Fig. 4.

Witnesses:
C. D. Ludley
James F. Duhamel.

Inventors
Edward B. Hess
Joseph M. Stoughton
by their Attorneys
Baldwin, Davidson & Wright

UNITED STATES PATENT OFFICE.

EDWARD B. HESS, OF NEW YORK, AND JOSEPH M. STOUGHTON, OF YONKERS, NEW YORK, ASSIGNORS TO THE CENTURY MACHINE COMPANY, OF NEW YORK, N. Y.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 637,335, dated November 21, 1899.

Application filed February 27, 1899. Serial No. 707,121. (No model.)

To all whom it may concern:

Be it known that we, EDWARD B. HESS, of the city and county of New York, and JOSEPH M. STOUGHTON, of the city of Yonkers, county of Westchester, State of New York, citizens of the United States of America, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

In our Letters Patent of the United States, No. 610,400, dated September 6, 1898, a type-writing machine is disclosed of the same general character as that herein described; and the present invention in its main features constitutes an improvement upon the construction shown in that patent. In this general class of type-writing machines the pivoted type-bars are each provided with a plurality of type or characters arranged longitudinally thereon and each bar operated upon through the medium of a plurality of finger-keys, one or more of which impart to the type-bar a motion around its pivot and longitudinally or in the direction of its length to bring the desired character to the point of printing or impact upon the platen.

In the machine herein described, as in that of the above-mentioned patent, each type-bar is equipped with a sleeve having three type-carrying faces, upon each of which a series of type is arranged longitudinally, three type being shown upon each such face. Each type-carrying sleeve may be partially rotated at will to bring the type or characters upon either of its three surfaces opposite the platen in proper position to print when the lever is operated. Three keys are shown for each lever, and each key when depressed brings to the printing-point the corresponding character upon that face of the type-carrying sleeve then opposite the platen.

The present invention comprises certain improvements in the mechanism for shifting or partially rotating the type-bearing sleeves and also a new organization whereby when a type-bearing-sleeve-shifting key is depressed to shift or partially rotate the sleeves they are locked or held in their new position without the necessity of the operator holding his finger upon the shifting-key and may when desired be released and returned to their normal position by a slight impulse of depression being imparted to the same shifting-key.

The invention also comprises other features hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a rear elevation of the parts to the right of the line 1 1 of Fig. 2, the universal bar and arm projecting therefrom and controlling the carriage-feed being omitted; Fig. 2, a vertical transverse section through a machine illustrating so much thereof as is deemed requisite to the full explanation of this invention. Fig. 3 is a rear elevation of some of the parts appearing at the upper side of Fig. 1, but with the type-bars omitted; Fig. 4, a detail view showing the locking device for holding the shifting-keys in either of two positions in which they may be set by the operator, this view being substantially a section on the line 4 4 of Fig. 1. Fig. 5 shows a key-lock device engaging the universal bar for locking the keys against manipulation.

The type-bar-actuating mechanism, Fig. 2, is the same as that shown in our application, Serial No. 688,981, filed August 19, 1898. It is as follows: For each type-bar there is a vertical plate 1, pivoted at its lower end in the bed-plate and having in its enlarged or widened upper end three slots 2 3 4. The upper and substantially horizontal slot 2 is preferably curved concentric to the pivot of the plate and connects at its ends with the downwardly-extending slots 3 4, which first diverge, inclining, respectively, toward the front and rear of the machine, and then near their bottoms converge at a comparatively slight angle. The length of the slots and their shape, arrangement, and location are such as to effect the operations hereinafter described. For each such plate there are three finger-keys 5 6 7, and the keys 5 7 carry laterally-projecting lugs or studs 5′ 7′, which when the keys and other parts are in their normal inactive positions, as shown in Figs. 1 and 2, occupy the ends of the slot 2. The lugs 5′ 7′ act as stops to limit the rise of the keys 5 7 and also, when both these keys are inactive, as stops to prevent motion of the plate 1 about its pivot. The central key 6 may have a cross-pin 6′, engaging the under face of the top plate to limit its upward move-

ment. The keys may be constructed in any desired manner. As shown, each has at its lower end a lateral projection with an aperture through which passes a vertical pin 8, fixed in the bed-plate, a coiled spring 9, surrounding the pin, being interposed between the lateral projection of the key and the bed-plate.

Each type-bar 10 may be constructed in any suitable manner of one or more pieces and is pivoted at 10′ on the rear end of a horizontal bar or plate 11, pivoted at 11′ on the plate 1 and pivotally connected at its front end to a vertical bar 12, rocking upon a pivot 12′ in the bed-plate. At a suitable point between the pivots 11′ 12′ a horizontal bar 13 is pivoted to the bar 12, and at or near its rear end the bar 13 is connected by a swiveling link 14 with a projection on the type-bar adjacent to its pivot. The rear end of bar 13 is guided in a vertical slotted guide-plate 15, and the front end of the bar 11 has an upwardly-extending projection similarly guided in a slot in a horizontal plate 15′. Preferably the horizontal bar 11 is formed with a hook 16 at its upper edge, the vertical part of which extends across the slot 2 and the horizontal part above the lug or stud 5′. The upper edge of the hook works in a slot in a transverse slotted rod 17. In these or any other suitable ways the mechanism may be guided and braced against lateral strains.

As is well understood, each type-bar 10, except the middle one, is angularly displaced or bent with reference to a horizontal plane to bring the letters or characters thereon to the proper printing-point on the platen. Also the axis of the pivot 10′ of each type-bar is at such angle to the axis of the platen-roller as to cause the characters on the type-bars to properly converge on the printing-point when the bars are actuated to take an impression. This may be conveniently accomplished by deflecting the rear ends (those nearest the platen) of the bars 11 on each side of the central one, to which the central type-bar is pivoted. This is well understood and is shown in Figs. 1 and 2.

In the construction of our application referred to each key has a foot or projection 18, as in the present case, which extends over a pin or stud projecting laterally from the bar 13, which bears upon the universal bar 20. In the present invention, however, this pin 19, over which the projections 18 of the keys extend, is mounted upon a horizontal arm 21, pivoted at 22 to the upright link or lever 12 and connected with the arm 11 by a spring 23, which normally draws it upward. A slot 24 is formed in the horizontal bar 13, and the pin 19, which occupies this slot, is held normally in its upper end. The universal bar 20 is in contact with the lower edge of the arm 21. If now either key 5, 6, or 7 be depressed, the arm 21 will first be urged downward and depress the universal bar for the purpose hereinafter described, and then the pin 19, coming against the bottom of the slot 24, will depress the bar 13 and effect the operation of the type-bar. Except in this respect the organization already described is the same as that shown in our application. Before proceeding with the description of the purpose of the movement of the universal bar ahead of the type-bar the general operation of the parts thus far referred to will be described.

On the depression of the center key 6 the type-bar will be thrown down and the middle character on the face thereof then opposite the platen may be printed. The parts are returned to their normal positions by the springs 9 and 13′, and no special device is required during this movement of the middle key 6 to hold the plate stationary, the lugs 5′ 7′ performing this function. If the key 7 be depressed, the same operation occurs, with the addition that a longitudinal movement of the type-bar toward the rear of the machine occurs, so that the letter or character nearest the key is brought to the printing-point. This operation is effected by the lug 7′ passing down the inclined slot 4 in the plate 1, thus rocking the plate 1 upon its pivot and carrying it toward the rear of the machine until the lug enters the reversely-inclined bottom part of the slot, which, however, now stands vertically, with the plate in the angular position into which it has been rocked. The movement of the plate therefore ceases and the continued descent of the key produces the impact of the type upon the platen. During this operation the slot 2 permits the free movement of the plate 1 relatively to the lug 5′ on the key 5. When the key 5 is depressed, precisely the same operation occurs, except that the lug 5′ now moves the plate 1 toward the front of the machine, thus imparting a longitudinal movement to the type-bar in the reverse direction, thus bringing the character which is farthest from the key to the printing-point on the platen.

25 indicates a space-key normally held up by a spring 9, as are the other keys, and capable of operating on its depression upon the universal bar to effect the feed of the carriage. Each type-bar has at its end a type-bearing sleeve with three faces and capable of partial rotation to bring the desired face opposite the platen X. Normally the central type-face is opposite the platen, and the sleeve may be rotated at will in either direction to bring either of the other faces opposite the platen. This may be effected as follows:

Each type-sleeve on the face opposite the central type-bearing face is provided with one or more teeth or projections 26, that engage corresponding teeth 27 on a curved rack 28, suitably carried so as to be capable of endwise movement on a correspondingly-curved bridge-piece 29, connecting the side parts 30 30 of the frame. In the normal elevated position the type-bars engage their respective rack-teeth 27, and the ends of the type-bars beyond the sleeves lie in notches or slots in

a plate 31, whose edge is curved approximately correspondingly with the rack.

Extending downwardly from the bridge-piece 29 is a rigid plate 32. This plate carries a bifurcated spring 33, whose legs are crossed and pass respectively on opposite sides of a screw or stop 34 and bear upon or engage the opposite sides of a lug 35 on the endwise-movable rack. The rack is thus held normally in a central position. A cross-bar 36, preferably arched or curved upwardly in its middle portion, is pivoted upon the screw-bolt 34 and has an upwardly-extending arm 37, the end 38 of which lies between two lugs 39, projecting from the rear face of the endwise-movable rack. The ends of the cross-bar 36 extend through slots in the side plates 30 30 of the frame or in rear of such plates and are respectively connected by links or arms 40 with the lower ends of vertically-sliding shifting-keys 41 42, located at opposite sides of the machine. On the depression of the key 41 it is obvious that the rack will be moved in one direction and on the depression of key 42 that it will be moved in the opposite direction, whereby the type-bearing faces of the sleeves on either side of their central faces may at will be simultaneously turned toward the platen, and that upon the rise of either key the type-sleeves will return to their normal central position. One of the keys 41 or 42 is formed with three notches or slots 43 44 45 in one of its edges, and on the side of the casing or frame adjacent to the slotted edge of the key is pivoted at 46 a swinging arm 47, having a curved segmental laterally-extending end 48, so shaped as to hang normally with the end of the segmental part 48 out of the plane of the vertically-moving key 41. The link 49, having a slot, in the lower end of which the universal bar 20 normally lies, is pivoted to the segmental locking-arm 47 48, adjacent to its pivot 46. On the depression of the space-key 25 or on the depression of any of the character-keys 5 6 7 and before the type-bars are operated the universal bar 20 will be depressed through the initial portion of its normal movement and cause the segmental locking-arm to move in the direction of the arrow, Fig. 4. In the normal condition of the machine when the central faces of the type-bearing sleeves are opposite the platen and any of the keys is being operated the segmental arm 48 will play freely back and forth in the slot or notch 44 in the key 41 and serves to prevent the depression of either of the shifting-keys while any other one of the keys is in action. If the key 41 be depressed to effect the partial rotation of the type-bearing sleeves in one direction and a character-key or the space-key be then depressed, the segmental locking-arm 48 will enter the slot 43 of the key 41, when the operator may remove his finger from the key 41, and the lower wall of the slot 43, which is indicated as being formed with a knife edge, will bear against the lower edge of the segmental locking-bar 48 and hold it therein. The character-keys or the space-key may now be manipulated to print from the characters on the faces of the type-sleeves now opposite the platen, the universal bar then playing freely in the slot in the link 49. The parts may be returned to their normal positions by a slight pressure on the key 41, which serves to release the segmental locking-arm from the pressure thereof and permit it to swing by gravity to its normal retracted position. If the shifting-key 42 be depressed, the effect is to elevate the key 41 and bring its lower slot or notch 45 into the path of the segmental locking-arm 47, the operation or behavior of the parts being the same as already described in connection with the key 41, except that now the upper wall of the slot 45 is formed with a knife edge and bears against the upper edge of the locking-arm 48. A slight pressure of the key 42 serves to release it and restore the parts to their normal position. In either case the reaction of the spring 33 presses the knife-edged wall of the slot against the segmental locking-plate 48. This part of the invention may of course be embodied in other forms by those skilled in the art without departing from the principles of the invention. The mechanism is one by which on the depression of a type-face-shifting key the parts are automatically locked in their new position when the key is released, during which time the character-keys may be manipulated in the ordinary way.

Another element of our invention which may be embodied in forms other than that shown is that during the time a shifting-key is being depressed the character-keys are locked against depression. In the particular construction shown this function or result is due to the fact that while a shifting-key is passing from one position to another the segmental locking-arm, if actuated by the initial depression of the universal bar on the partial depression of a character-key, would abut against the face of the shifting-key and prevent such further depression of the bar as to permit the arm 13 of the character-key effecting the actuation of its type-bar. When, however, the shifting-key has reached the proper position, the segmental locking-arm will, when a character-key is depressed, enter the slot in the shifting-key and, while locking that key, permits, as described, the operation of any character-key.

The next feature of the invention relates to the locking of the keys against manipulation during the absence of the operator. To accomplish this, some suitable locking mechanism engaging the universal bar 20 may be employed. Thus in Fig. 5 we have indicated an ordinary key-lock 50, which is preferably located at the left-hand end or side of the machine. This lock has a bolt 51, with a slotted or forked end, which when the bolt is thrown forward straddles the universal bar and thereby locks the space and character keys of the

machine against depression. In order, however, to also lock the shifting-keys 41 42, the arrangement shown in Fig. 2 and already described is provided. Thus on the initial or partial depression of the space-key or any character-key the universal bar is partially depressed before the type-bars are moved at all. This initial or preliminary depression of the universal bar causes the segmental locking-plate 48 to enter the middle slot or notch 44 of the shifting-key 41 and to bring the end of the universal bar into proper position to be engaged by the bolt of the lock, as shown in Fig. 5, where the dotted circle indicates the normal position of the universal bar and the solid-line section thereof its partially-depressed position.

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

1. The combination of the multifaced parts or type-bearing sleeves adapted to be partially rotated, mechanism by which they may be simultaneously partially rotated, and two shifting-keys connected with such mechanism whereby when one key is depressed to shift the type-bearing sleeves the other key is by the actuation of the mechanism elevated.

2. The combination of the multifaced parts or type-bearing sleeves adapted to be partially rotated, mechanism by which they may be simultaneously partially rotated, two shifting-keys connected with such mechanism whereby when one key is depressed to shift the type-bearing sleeves, the other key is by the actuation of the mechanism elevated, and a spring tending to hold said mechanism in its normal position.

3. The combination of the multifaced parts or type-bearing sleeves adapted to be partially rotated, mechanism by which they may be simultaneously partially rotated, two shifting-keys connected with such mechanism whereby when one key is depressed to shift the type-bearing sleeves, the other key is by the actuation of the mechanism elevated, and a locking device that automatically maintains either key in its depressed position.

4. The combination of the multifaced parts or type-bearing sleeves adapted to be partially rotated, mechanism by which they may be simultaneously partially rotated, two shifting-keys connected with such mechanism whereby when one key is depressed to shift the type-bearing sleeves, the other key is by the actuation of the mechanism elevated, a locking device that automatically maintains either key in its depressed position, but is adapted to be automatically thrown out of action by a renewed pressure upon one of the keys.

5. The combination of the multifaced type-bearing parts or sleeves adapted to be partially rotated, an endwise-movable rack with which they are normally engaged, a pivoted cross-bar or lever engaging the rack and a shifting-key connected with each end of the lever.

6. The combination of the multifaced type-bearing parts or sleeves adapted to be partially rotated, an endwise-movable rack with which they are normally engaged, a pivoted cross-bar or lever engaging the rack, a shifting-key connected with each end of the lever, and a spring serving to hold the rack in its normal central position.

7. The combination of a shifting-key and a locking device automatically actuated upon the depression of a character-key to lock the shifting-key against manipulation.

8. The combination of two type-face-shifting keys mechanically connected and a locking device operated upon the depression of any character-key to lock both shifting-keys against depression.

9. The combination of a shifting-key, a locking device and means whereby the locking device is applied to the shifting-key in either of its positions upon the depression of a character-key.

10. The combination of the multifaced type-bearing parts or sleeves adapted to be partially rotated, mechanism for so partially rotating them, two shifting-keys for actuating such mechanism, a locking device actuated upon the depression of any character-key to lock either shifting-key in either its normal or depressed position.

11. The combination of the multifaced type-bearing parts or sleeves adapted to be partially rotated in either direction from the normal position, mechanism for so partially rotating them, two shifting-keys adapted to operate such mechanism in either direction and a locking device operated upon the depression of any character-key to hold either key in its depressed position.

12. The combination of the multifaced type-bearing parts or sleeves adapted to be partially rotated in either direction from the normal position, mechanism for so partially rotating them, two shifting-keys adapted to operate such mechanism in either direction, and a locking device operated upon the depression of any character-key and adapted to hold either key in its normal or in its depressed position.

13. The combination of the multifaced type-bearing parts or sleeves adapted to be rotated in either direction from the normal central position, mechanism for so partially rotating it, shifting-keys for actuating such mechanism, the universal bar, the pivoted swinging segmental locking-plate adapted to engage one of the shifting-keys whereby upon the depression of a character-key the shifting-key is locked against manipulation.

14. The combination of the notched or slotted shifting-key adapted to assume different positions, of a segmental locking-plate adapted to enter said notches but normally held out of engagement therewith, and means whereby on the depression of a character-key the locking-plate is actuated to engage a slot in the shifting-key.

15. The combination of a shifting-key having two or more notches or slots therein, of a pivoted swinging segmental locking-arm normally held out of engagement with the key, a spring serving to return the shifting-key to its normal position and means whereby upon the depression of a character-key the locking-arm is caused to enter one of the slots of the shifting-key according to its position, the locking-arm being held in engagement with the slot in the key by the reaction of said spring, but capable of being released by a renewed pressure.

16. The combination of the type-bars, character-keys and interposed actuating mechanism, the universal bar, means whereby on the depression of a key the universal bar is actuated through part of its stroke without affecting the type-bars, a shifting-key, a locking device actuated upon said partial movement of the universal bar to lock the shifting-key, and a locking device adapted to be applied at the will of the operator to the universal bar to lock the character-keys and shifting-key against manipulation.

17. The combination of a series of character-keys, type-face-shifting mechanism, and the locking device acting to lock the character-keys against depression during the time that the shifting mechanism is being operated.

18. The combination of a series of character-keys, type-face-shifting mechanism, and locking devices acting to lock the shifting mechanism when it has been fully actuated and to lock the character-keys while the shifting mechanism is being actuated.

19. The combination of the multifaced parts or type-bearing sleeves adapted to be partially rotated, the character-keys, mechanism by which said parts may be partially rotated, two shifting-keys connected with such mechanism, and means for locking the character-keys while either shifting-key is being depressed.

20. The combination of the type-bars, character-keys and multifaced type-bearing parts or sleeves adapted to be partially rotated, mechanism by which such parts may be partially rotated, two shifting-keys connected with said mechanism, means for locking the character-keys while either shifting-key is being operated, and means for locking the shifting-keys when depressed while leaving the character-keys free to be operated.

21. The combination of character-keys, a shifting-key and a locking device automatically actuated upon the depression of the shifting-key to lock the character-keys against depression during the time that the shifting-key is being operated.

22. The combination of character-keys, two shifting-keys and locking devices automatically actuated upon the depression of either shifting-key to lock the character-keys against depression during the time that either shifting-key is being operated.

In testimony whereof we have hereunto subscribed our names.

EDWARD B. HESS.
JOSEPH M. STOUGHTON.

Witnesses:
L. BAMBERGER,
HERBERT C. HESS.