No. 753,972. PATENTED MAR. 8, 1904.

C. GABRIELSON.

TYPE WRITING MACHINE.

APPLICATION FILED JAN. 21, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

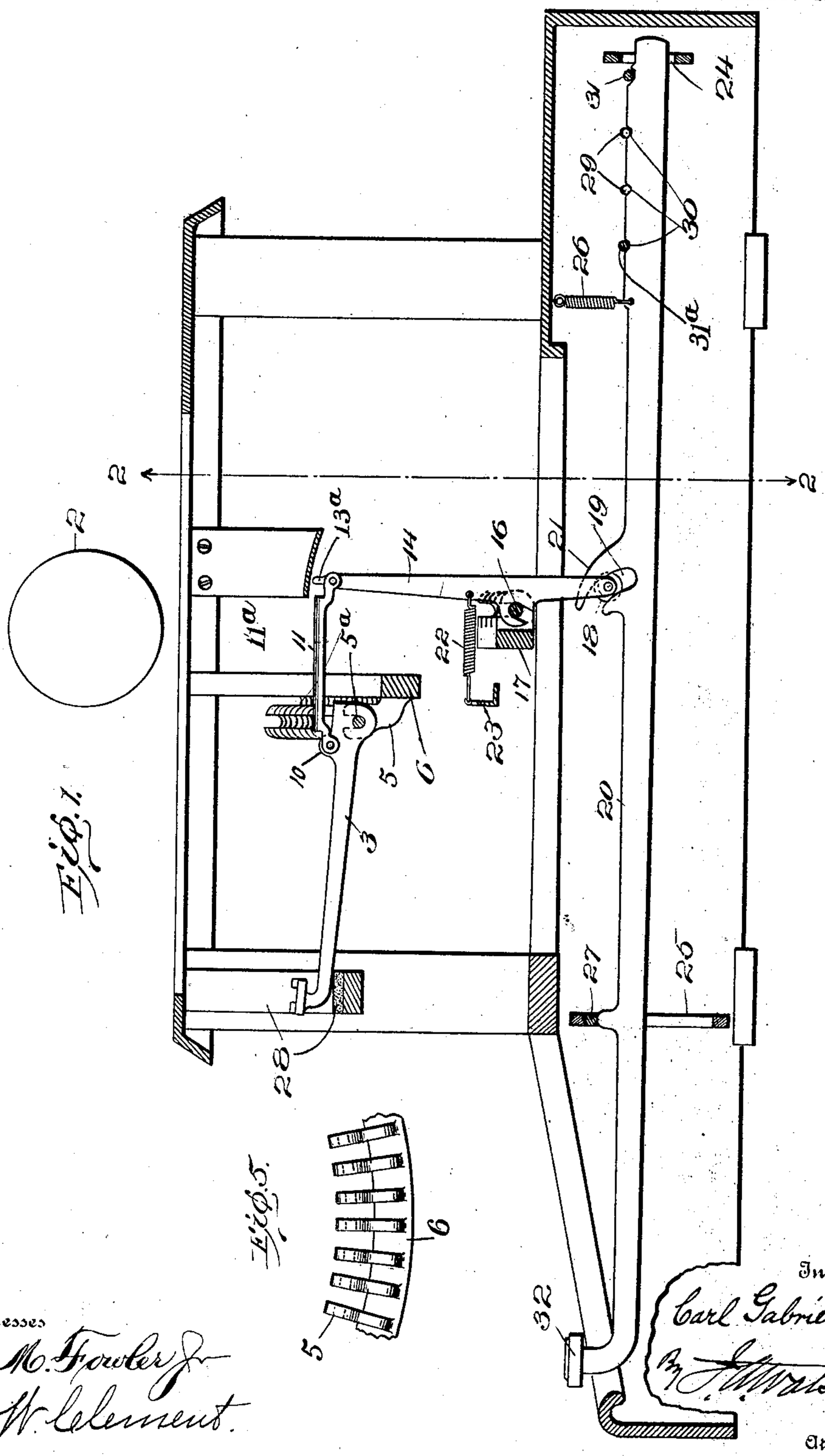

Fig. 1.

Fig. 5.

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NO MODEL. 2 SHEETS—SHEET 2.

Fig. 2.

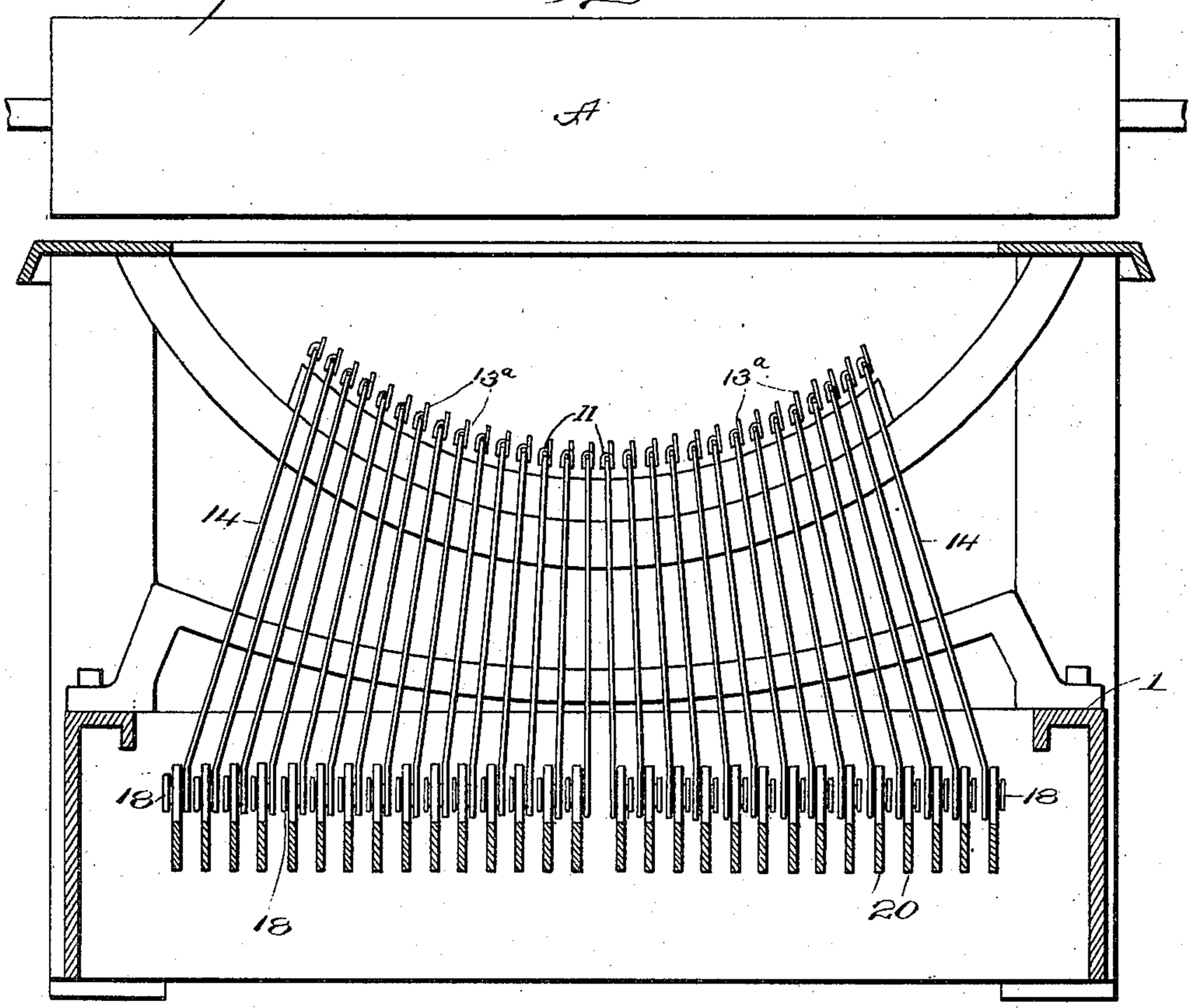


Fig. 3.

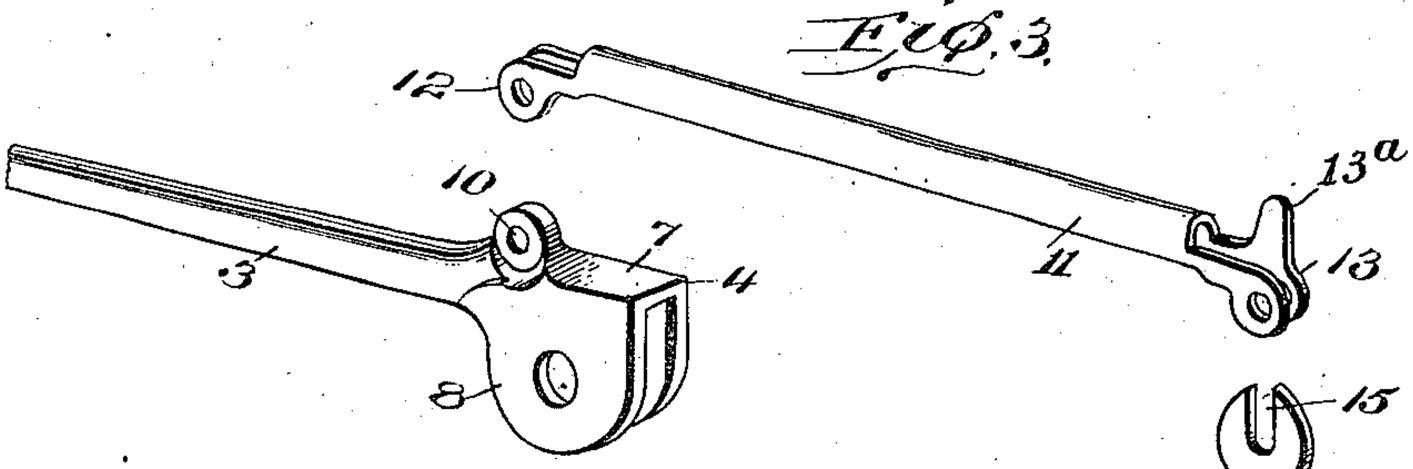
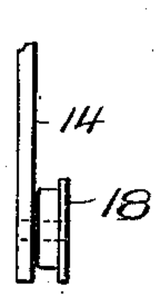


Fig. 4.



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UNITED STATES PATENT OFFICE.

CARL GABRIELSON, OF WORCESTER, MASSACHUSETTS, ASSIGNOR TO L. C. SMITH AND BROS. TYPEWRITER COMPANY, OF SYRACUSE, NEW YORK, A CORPORATION OF NEW YORK.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 753,972, dated March 8, 1904.

Application filed January 21, 1903. Serial No. 139,971. (No model.)

To all whom it may concern:

Be it known that I, CARL GABRIELSON, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

This invention comprises improvements in type-bar-operating mechanism of type-writing machines; and it has for its object to simplify the connections between the key and the type-bar and to improve the construction and action of said parts.

The invention will be fully described in connection with the accompanying drawings, in which—

Figure 1 is a central vertical section of a type-writing machine, taken from front to rear. Fig. 2 is a section on the line 2 2 of Fig. 1 looking toward the front of the machine. Fig. 3 is a perspective view showing a type-bar, sublever, and connecting-link in perspective and separated. Fig. 4 is a detail of one of the sublevers. Fig. 5 is a front view of a section of the fulcrum-supports for the type-bars.

Referring to the drawings, 1 indicates a suitable frame upon which the various operating parts of the machine are mounted, and 2 indicates the platen. To avoid confusion, I have omitted from the drawings the various parts of the machine which do not relate to the present invention.

The type-bars 3 are provided with inverted-U-shaped ends 4, which embrace and are pivotally connected to blades 5, the said blades being radially arranged upon a segment or fulcrum-support 6. The blades 5 are preferably integral with the bar 6, and each blade has parallel faces, which may be formed by a pair of saws or cutters. The fulcrum or pivot proper for the type-bars is a wire or rod 5^a, which rests in notches in the blades 5. The fulcrum-points of the type-bars are necessarily below the platen, and considerable difficulty has been experienced heretofore on account of the dirt and paper rubbings which drop from the platen lodging in and about the type-bar bearings. By making the type-bar bearings inverted-U-shaped, having closed tops 7 and inclosing side or wing pieces 8, which embrace the fixed bearing plate or fulcrum, I am enabled to keep the joints between the type-bars and their supports practically free from dirt, causing them to work freer and to need oiling and cleaning comparatively seldom.

Above and in front of each type-bar pivot 9 is a lug 10, to which a link 11 is pivotally connected. The link 11 is preferably of inverted-U shape in cross-section, having a pair of wings 12 at its forward end which embrace and are pivoted to the lug 10 and a pair of wings 13 at its rear end which are pivotally connected to the upper end of a sublever 14. As shown, the sublever is provided with an open slot 15 at its upper end to receive the pin passing through the lugs 13. To prevent the links 11 from becoming accidentally disconnected from the sublevers, a guard 11^a is located just over their rear ends, and a wing on each link is preferably provided with an extension 13^a, projecting toward said guard. By removing the guard 11^a any of the links may be removed and replaced.

The sublevers 14 are preferably arranged, as shown in Figs. 1 and 2, in a common plane and in radial lines extending directly from their respective key-levers to points in the rear of their respective type-bars. These sublevers are straight, and they are suitably pivoted intermediate of their ends on a rod 16, carried by a curved fulcrum-support 17, arranged in an upright plane. By this construction and arrangement all twisting strain upon the sublevers is avoided, as the fulcrum of each lever is in line with the points at which the power is received and transmitted. The lower end of each sublever carries an antifriction-roller 18, which travels in a curved cam-slot 19 in the corresponding key-lever 20. The cam-slot is inclined upwardly and forwardly and preferably curved. Each roller

18 has a flange to keep it properly in engagement with the type-lever, the upper horn or wall 21 of the cam-slot being arranged between the sublever and the flange of its roller. The upper arm of each sublever is normally thrown forward, as shown in Fig. 1, by a spring 22, connecting said sublever with a suitable stationary part 23. This spring assists in throwing the type-bar back from the platen and also in causing the lower end of the sublever to properly coöperate with the cam-slot 19. It will be evident that a simple cam-surface, such as the under surface of the horn 21, can be used instead of the cam-slot, the spring 22 keeping the roller 18 in contact with the cam. The cam-slot, however, is preferable in order that lost motion between the parts and consequent noise may be prevented.

The key-levers 20 preferably extend from front to rear in the usual manner. At their rear ends the levers are guided in vertical slots in a comb-bar 24, and near their forward ends they are guided in a second comb-bar 25. The keys are normally held in raised position by springs 26. As the key is released the lever strikes a soft stop or pad 27, and the type-bar drops back on a pad 28.

I provide means for changing the tension or resistance of the key-levers, so that the "touch" may be varied to suit different operators. As shown, this is accomplished by adjusting the fulcrums of the levers, which are located above and near their rear ends.

29 indicates a series of holes in the frame, and 30 a corresponding series of notches in the upper edges of the key-levers. 31 indicates a fulcrum-bar which may be inserted in any one of the holes 29 and made to correspond with the corresponding notches 30 of the levers. All of these holes and fulcrum-notches are located between the rear comb 24 and the lever-springs 26. It will be understood that the holes 29 are formed in the frame and may also be formed in plates intermediate the key-levers in order to support and stiffen the fulcrum-bar 31. A fixed fulcrum-bar 31^a coöperates with the inner notch 30.

It will be evident that the force necessary to depress any key 32 will depend upon the distance of the spring 26 from the fulcrum of the lever. By shifting the fulcrum-bar 31 to coöperate with different notches 30 the touch or tension of the key-levers may be varied to suit any operator. When the fulcrum is at the rear notch, as shown in Fig. 1, the resistance of the key is greatest, and said resistance decreases as the fulcrum is moved toward the spring 26. When the fulcrum 31^a is to be used, the bar 31 must be removed. The fixed bar 31^a prevents the levers from being displaced by springs 26 when the bar 31 is removed for adjustment.

It will be evident that the details of construction and arrangement of parts of the foregoing mechanism may be varied without departing from the spirit and scope of my invention. For instance, the cam-slots might be located in the lower ends of the sublevers and the rollers 18 on the key-levers, which is a reversal of the arrangement illustrated. Therefore I do not limit myself to the precise construction illustrated and described.

What I claim, and desire to secure by Letters Patent, is—

1. In a type-writing machine, the combination with a type-bar arranged to swing upwardly and rearwardly, of a substantially straight upright sublever having a pivot intermediate of its ends, a link connecting the upper end of the sublever with the type-bar, and a key-lever having a curved cam-surface engaging the lower end of the sublever.

2. In a type-writing machine, the combination of a type-bar arranged to swing upwardly and rearwardly, an upright sublever having a pivot intermediate of its ends, a link connecting the upper end of the sublever with the type-bar, and a key-lever in engagement with the lower end of the sublever, said key-lever having a curved cam-surface adapted to swing the lower end of the sublever in a horizontal direction.

3. In a type-writing machine, the combination of a platen, a segment below the platen, a series of front-strike type-bars pivoted to said segment, a series of substantially straight upright sublevers arranged in a common plane in the rear of the segment, links connecting the upper ends of the sublevers with their respective type-bars, and key-levers each having a curved cam-surface in engagement with the lower end of its respective sublever.

4. In a type-writing machine, the combination of a platen, a segment below the platen, a series of front-strike type-bars pivoted to said segment, a series of substantially straight sublevers radiating from points in the rear of their respective type-bars to their respective key-levers, a curved fulcrum-bar for said sublevers, and a series of key-levers, said sublevers being operatively connected with their respective type-bars and key-levers.

5. In a type-writing machine, the combination with a segment and a series of type-bars pivoted to said segment, of a series of key-levers, and a series of substantially straight upright sublevers arranged in radial lines upon a curved pivotal support, said support being arranged in an upright plane and said sublevers being operatively connected to their respective type-bars and key-levers.

6. In a type-writing machine, the combination of a platen, a segment arranged below the platen, a series of type-bars mounted on said segment, a series of key-levers having curved cam-surfaces, and a series of substantially straight upright sublevers pivotally mounted intermediate of their ends, the upper ends of said sublevers being in rear of and connected to their respective type-bars, and said suble-

vers radiating to their respective key-levers and being operatively engaged with the cam-surfaces thereof.

7. In a type-writing machine, the combination with the platen, and a series of front-strike type-bars having their fulcrums arranged in a curved line below the platen, of a series of key-levers, a series of upright sublevers radiating from their respective key-levers to points in the rear of their respective type-bars, cams on the key-levers with which the lower ends of the sublevers are engaged, springs connected with the sublevers and holding them in engagement with their respective cams, and links connecting the upper ends of the sublevers with the type-bars.

8. In a type-writing machine, the combination of a series of key-levers, a series of openings in the fixed frame of a machine, and a fulcrum-bar adjustable to any one of said openings to vary its position with respect to the key-levers, and means for holding said key-levers in operative contact with said fulcrum-bar.

9. In a type-writing machine, the combination of a series of key-levers, a fixed fulcrum-bar coöperating with said key-levers, and a second fulcrum-bar adjustable lengthwise of the key-levers to vary the leverage thereof.

10. In a type-writing machine, the combination with a series of key-levers, each provided with a series of fulcrum-notches, of a fixed fulcrum-bar coöperating with one of the notches of each key-lever, and a second fulcrum-bar adjustable to coöperate with the remaining notches.

11. In a type-writing machine, the combination with the sublevers having open notches in their ends, of links having pins adapted to engage said notches, and a guard-plate arranged to prevent the links from being disengaged from the sublevers.

12. In a type-writing machine, the combination with the sublevers having open notches, of the links having pins engaging said notches, and also having projections adjacent to the pins, of a guard-plate arranged to coöperate with said projections to prevent disengagement of the links from the sublevers.

13. In a type-writing machine, the combination with a series of type-bars having U-shaped pivotal ends, of a segment having integral projecting blades with parallel faces, the U-shaped portions of the type-bars being adapted to embrace said blades.

In testimony whereof I affix my signature in presence of two witness.

CARL GABRIELSON.

Witnesses:
WALTER F. HOGAN,
E. J. TITCOMB.