No. 676,177. Patented June 11, 1901.

J. CORR.

TYPE WRITING MACHINE.

(Application filed Mar. 11, 1901.)

(No Model.) 2 Sheets—Sheet 1.

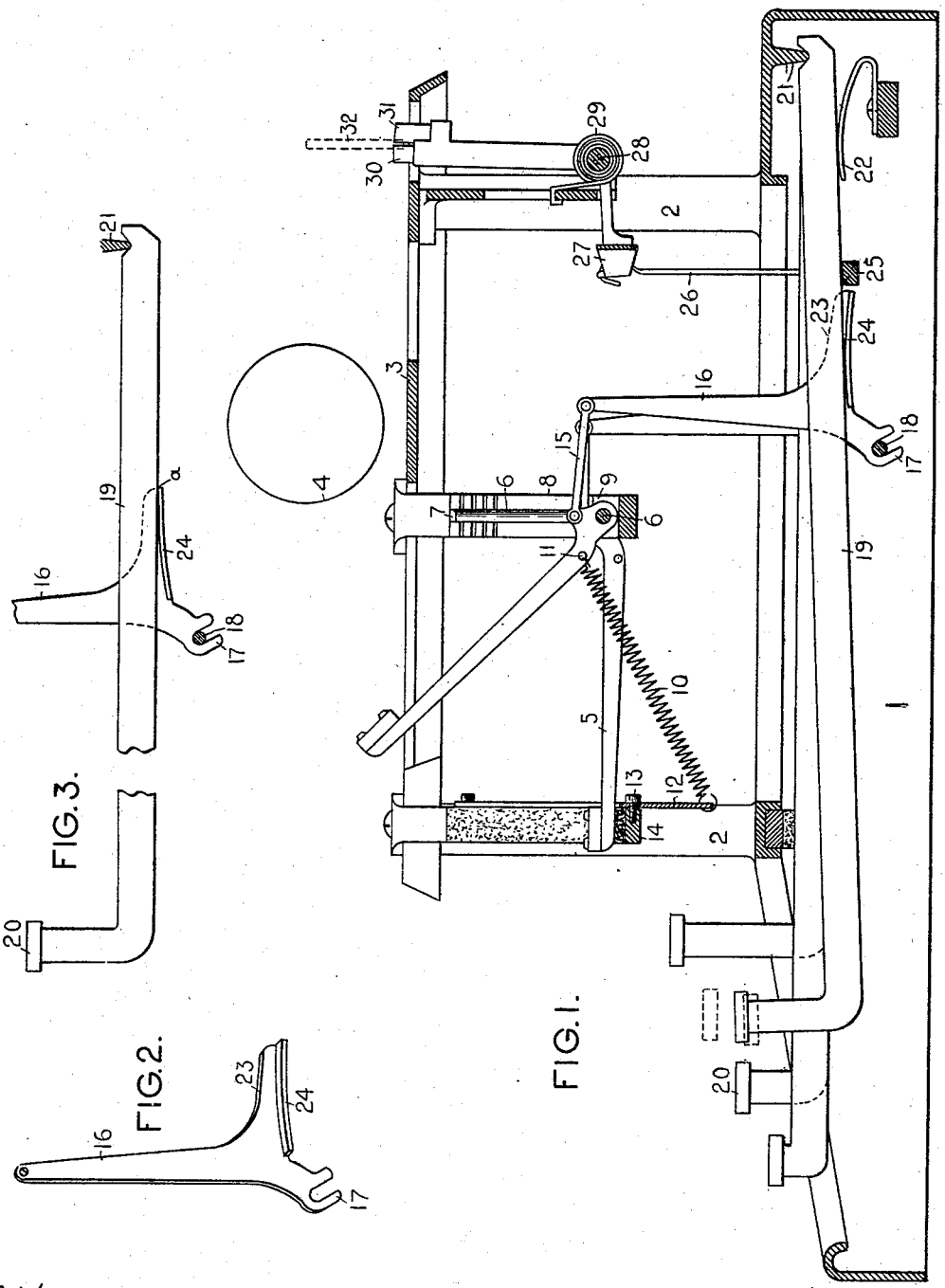

FIG. 1.

FIG. 3.

FIG. 2.

WITNESSES:

K. V. Donovan

Florence Keeling.

INVENTOR:

James Corr

by Jacob Talbot

HIS ATTORNEY

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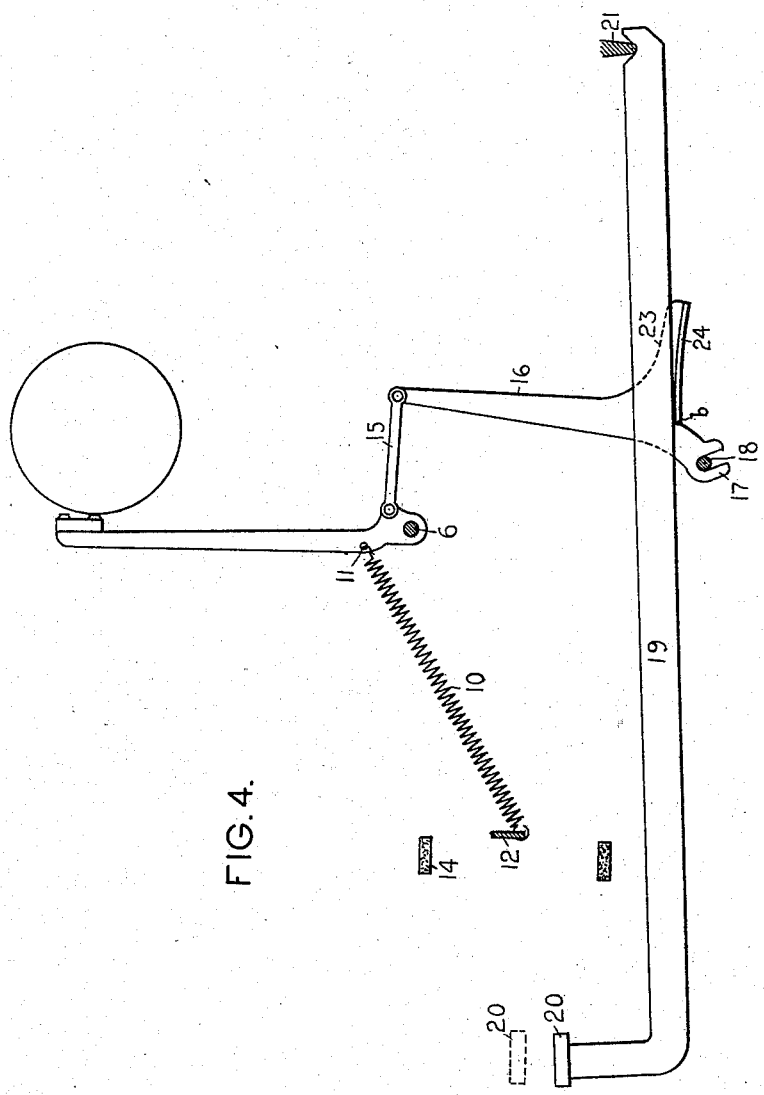

FIG. 4.

WITNESSES:
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UNITED STATES PATENT OFFICE.

JAMES CORR, OF JERSEY CITY, NEW JERSEY, ASSIGNOR TO UNION TYPE-WRITER COMPANY, OF SAME PLACE.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 676,177, dated June 11, 1901.

Application filed March 11, 1901. Serial No. 50,645. (No model.)

To all whom it may concern:

Be it known that I, JAMES CORR, a citizen of the United States, and a resident of Jersey City, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

This application relates to the type-actions of writing-machines.

The principal objects of my invention are to improve the touch of the keys, to cause the types to make powerful impressions upon the paper, and to enable the machine to be operated at high speed without danger of collision of the type-bars.

The invention consists in certain combinations of devices, features of construction, and arrangements of parts, all as will be hereinafter fully described, and particularly pointed out in the concluding claims.

In the accompanying drawings, Figure 1 is a vertical section taken longitudinally of a type-writing machine embodying my improvements. Fig. 2 is a perspective view of a bell-crank. Fig. 3 is a fragmentary view showing the normal relation between a key-lever and its associated bell-crank. Fig. 4 is a skeleton view similar to Fig. 1, but showing the parts inprinting position.

In the several views similar parts are designated by similar characters of reference.

Certain portions of the machine are omitted for the sake of clearness.

The framework of the machine comprises a rectangular base 1, corner-post 2, and top plate 3. Across the latter a platen 4 moves longitudinally in the usual manner. Rearwardly-striking type-bars 5 are pivoted at their rear ends upon a curved fulcrum-wire 6, which is seated in a slot 7, formed in a segment 8, the latter being radially slotted at 9 to receive the hubs of the type-bars and being supported upon the framework of the machine in any suitable manner. Each type-bar is provided with a returning-spring 10, one end of which hooks into a hole 11, formed in the lower edge of a curved plate 12, the latter being secured by screws 13 to a segmental type-rest 14, supported upon the framework. The type-bars are connected by rearwardly-extending links 15 to the upwardly-directed arms 16 of a series of bell-levers, which are detachably pivoted by means of forks 17 at their lower ends upon a fixed fulcrum-rod 18, which extends transversely beneath a series of key-levers 19. These levers are of the second order, having at their forward ends keys 20 and being fulcrumed at their rear ends upon a transverse bar 21, up against which they are pressed by returning-springs 22. It will be seen that the key-levers extend rearwardly beneath the type-bars and that the bell-levers are arranged forwardly of the key-lever fulcrums. Each bell-lever has a rearwardly-directed operating-arm 23, which extends longitudinally of its associated key-lever 19 and which along its lower edge is bent laterally at 24 to form a bearing rim or ledge, which occupies a position beneath the key-lever, so that the lower edge of the key-lever may work thereon. It will be seen that these bell-levers or sublevers are interposed between the key-levers, so that each arm 23 lies side by side with its associated key-lever. The arms 23 may, taken by themselves, be regarded as sublevers fulcrumed upon the bar 18 and may be otherwise connected to the type-bars, although retaining its ledge 24.

When a key 20 is depressed, its lever 19 is vibrated downwardly upon the fulcrum 21 and by bearing down upon the ledge 24 causes the bell-lever to vibrate rearwardly upon its fulcrum 18, and hence through the link 15 swings the type-bar up to print. It will be seen that the ledge 24 extends longitudinally of the key-lever 19 and lies between the fulcrums 18 and 21, and when in normal position the rear end of said ledge or the point thereof most remote from the fulcrum 18 and nearest to the fulcrum 21 is in contact with the lever 19. The ledge 24 is slightly curved or crowned, so that during the vibration of the lever 19 the working point or point of contact gradually rolls or creeps forwardly away from the fulcrum 21 and toward the fulcrum 18, as may be seen at Fig. 1, until at the completion of the printing stroke the key-lever bears upon the foremost end of said bearing-ledge—that is, at the point nearest the fulcrum 18 and most remote from the fulcrum 21, as at

Fig. 4. At the beginning of the stroke, owing to the nearness of the working point *a* to the fulcrum 21 and to the remoteness thereof from the fulcrum 18, the key-lever has a better leverage than at any other point in the stroke, and a minimum resistance is felt at the key upon contact of the finger therewith. As the key descends the levers vibrate, and the contact-point between the levers gradually recedes from the fulcrum 21 and approaches the fulcrum 18, so that the leverage of the key upon the type-bar gradually decreases without causing a shock to the finger of the operator. When the type-bar has reached a point midway between normal and printing positions, the key has made about three-fourths of its downstroke, as indicated at Fig. 1, the leverage of the key upon the type-bar being at this time much less than at the beginning of the stroke. During the remainder of the stroke the speed of the type-bar is greatly accelerated, and the resistance offered by the type-bar to the key reaches its maximum, the working point being at this time most remote from the fulcrum 21 and nearest the fulcrum 18, as indicated at *b*, Fig. 4. The gradual decrease in the leverage to the key upon the type-bar serves to cushion the stroke or minimize the jar upon the hand of the operator at the finish of the key-stroke, while owing to its accelerated speed the type-bar is enabled to deliver a sharp blow upon the platen or the paper thereon. When the key is relieved from pressure, the parts are returned to normal position by the springs 10 and 22. It will be seen at Fig. 1 that the type-bar returns half-way to normal position while the key is making only about one-fourth of its upstroke, so that the danger of colliding with a subsequently-operated type-bar is practically avoided, and the machine may hence be operated at high speed without trouble from this source. It will be observed that the bell-lever is vibrated in one direction by its key-lever and in the other direction by its connected spring 10.

As usual, each key-lever operates a universal bar 25, which extends transversely beneath the key-lever system and is supported by hooks 26, which hang from a dog-rocker frame 27, the latter being pivoted at 28 and provided with a returning-spring 29. Dogs 30 and 31, carried upon said rocker, coöperate with an escapement-wheel 32 to govern the letter-feeding movements of the platen 4, as usual.

Variations may be made in construction and arrangement without departing from the gist of my invention.

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

1. In a front-strike writing-machine, the combination with a platen, of a series of rearwardly-striking type-bars, a series of bell-levers connected thereto, and a series of key-bearing levers, each bell-lever having an arm which extends longitudinally of its associated key-lever and upon which the key-lever operates at successive points so as to decrease the leverage of the key upon the type-bar during its printing stroke.

2. In a front-strike writing-machine, the combination with a platen, of a series of rearwardly-striking type-bars, a series of bell-levers operatively connected thereto, and a series of key-levers, each of said bell-levers having an arm which extends longitudinally of its associated key-lever, and said arm having a curved surface upon which the key-lever bears, the point of contact between the key-lever and said arm creeping gradually along said curved surface during the printing stroke, so as to decrease the leverage of the key upon the type-bar.

3. In a front-strike writing-machine, the combination with a platen of a series of rearwardly-striking type-bars, a series of bell-levers operatively connected thereto and having rearwardly-extending arms, and a series of levers bearing keys at their forward ends and fulcrumed at their rear ends in rear of said bell-levers, each bell-lever having a rearwardly-extending arm upon the rear end of which the key-lever operates at the beginning of the printing stroke, the bearing-point of said key-lever moving forwardly during the printing stroke so as to decrease the leverage of the key upon the type-bar.

4. In a front-strike writing-machine, the combination with a platen, of a series of rearwardly-striking type-bars, a series of rearwardly-extending key-levers of the second order, a series of bell-levers fulcrumed on a bar which extends transversely beneath said key-levers and forwardly of the key-lever fulcrums, said bell-levers being connected to the type-bars and having arms which extend rearwardly along the key-levers, and having surfaces upon which the key-levers bear, the point of contact between the key-levers and said arms shifting forwardly during the printing strokes so as to decrease the leverage of the keys upon the type-bars.

5. In a type-writing machine, the combination with a platen, of a series of type-bars, a series of key-levers, and a series of sublevers connected to the type-bars, each sublever being arranged alongside of its key-lever and having an offset bearing portion with which a working edge of the key-lever contacts at successive points, so as to decrease the leverage of the key upon the type-bar during the printing stroke.

6. In a type-writing machine, the combination with a platen, of a series of type-bars, a series of key-levers, and a series of sublevers connected to the type-bars, each sublever being arranged alongside of its key-lever and having an offset curved bearing-surface extending longitudinally of the key-lever and upon which a working edge of the key-lever bears at successive points so as to decrease the leverage of the key upon the type-bar during the printing stroke.

7. In a type-writing machine, the combination with a platen, of a series of type-bars, a series of key-levers, and a series of sublevers connected to the type-bars, each sublever having a curved ledge portion which extends longitudinally of its associated key-lever and upon which the key-lever bears at successive points so as to gradually decrease the leverage of the key upon the type-bar during the printing stroke.

8. In a type-writing machine, the combination with a platen, of a series of type-bars, a series of levers having keys at their forward ends and fulcrumed at their rear ends, a series of sublevers connected to the type-bars and arranged between the key-levers, each sublever having at its lower edge a curved ledge upon which the lower edge of the key-lever bears at successive points, so as to gradually decrease the leverage of the key upon the type-bar during the printing stroke.

9. In a front-strike writing-machine, the combination with a platen, of a series of rearwardly-striking type-bars, a series of key-bearing levers, and a series of bell-levers connected to the type-bars, each bell-lever having an arm which extends alongside of its associated key-lever, and each of said arms having an offset portion upon which the working edge of said key-lever bears at successive points, so as to decrease the leverage of the key upon the type-bar during the printing stroke.

10. In a front-strike writing-machine, the combination with a platen, of a series of rearwardly-striking type-bars, a series of key-levers, and a series of bell-levers which cross the key-levers, each bell-lever having a ledge or rim upon which an edge of the key-lever bears at successive points, so as to decrease the leverage of the key upon the type-bar during the printing stroke.

11. In a front-strike writing-machine, the combination with a platen, of a series of rearwardly-striking type-bars, a series of key-levers extending rearwardly beneath the type-bars and fulcrumed at their rear ends, a series of bell-levers fulcrumed upon a bar which extends transversely beneath the key-levers, said bell-levers having both upwardly-directed arms and arms which extend longitudinally of the key-levers, and the latter arms having curved ledges upon which the lower edges of the key-levers work, the contact-points between the key-levers and ledges changing during the printing strokes so as to decrease the leverage of the keys upon the type-bars.

12. In a front-strike writing-machine, the combination with a platen, of a series of rearwardly-striking type-bars, a series of key-levers extending rearwardly beneath the type-bars and fulcrumed at their rear ends, a series of bell-levers fulcrumed upon a bar which extends transversely beneath the key-levers, said bell-levers having both upwardly-directed arms and arms which extend longitudinally of the key-levers, and the latter arms having curved ledges upon which the lower edges of the key-levers work, the contact-points between the key-levers and ledges creeping during the printing strokes, so as to decrease the leverage of the keys upon the type-bars, springs 22 for returning the key-levers, and springs 10 for returning the type-bars and bell-levers.

13. In a front-strike writing-machine, the combination with a platen and a series of rearwardly-striking type-bars, of a series of key-levers, a series of bell-levers connected to the type-bars, and a series of springs for returning the bell-levers to normal position, each bell-lever having an arm which extends longitudinally of its associated key-lever and upon which the key-lever bears at successive points, so as to decrease the leverage of the key upon the type-bar during the printing stroke, the bell-lever being vibrated in one direction by the key-lever and in the other direction by its spring.

14. In a front-strike writing-machine, the combination with a platen, of a series of rearwardly-striking type-bars, key-levers 19 extending rearwardly beneath the type-bars and fulcrumed at their rear ends, bell-levers having at their lower ends forks 17 which engage a common fulcrum-bar 18 extending transversely beneath the key-levers, said bell-levers having upwardly-extending arms 16 which are connected by links 15 to the type-bars, and also having rearwardly-extending arms 23 provided with ledges 24 upon which the lower edges of the key-levers bear at successive points so as to decrease the leverage of the keys upon the type-bars during the printing strokes, and springs 10 connected to the type-bars.

Signed at the borough of Manhattan, city of New York, in the county of New York and State of New York, this 8th day of March, A. D. 1901.

JAMES CORR.

Witnesses:
K. V. DONOVAN,
E. M. WELLS.