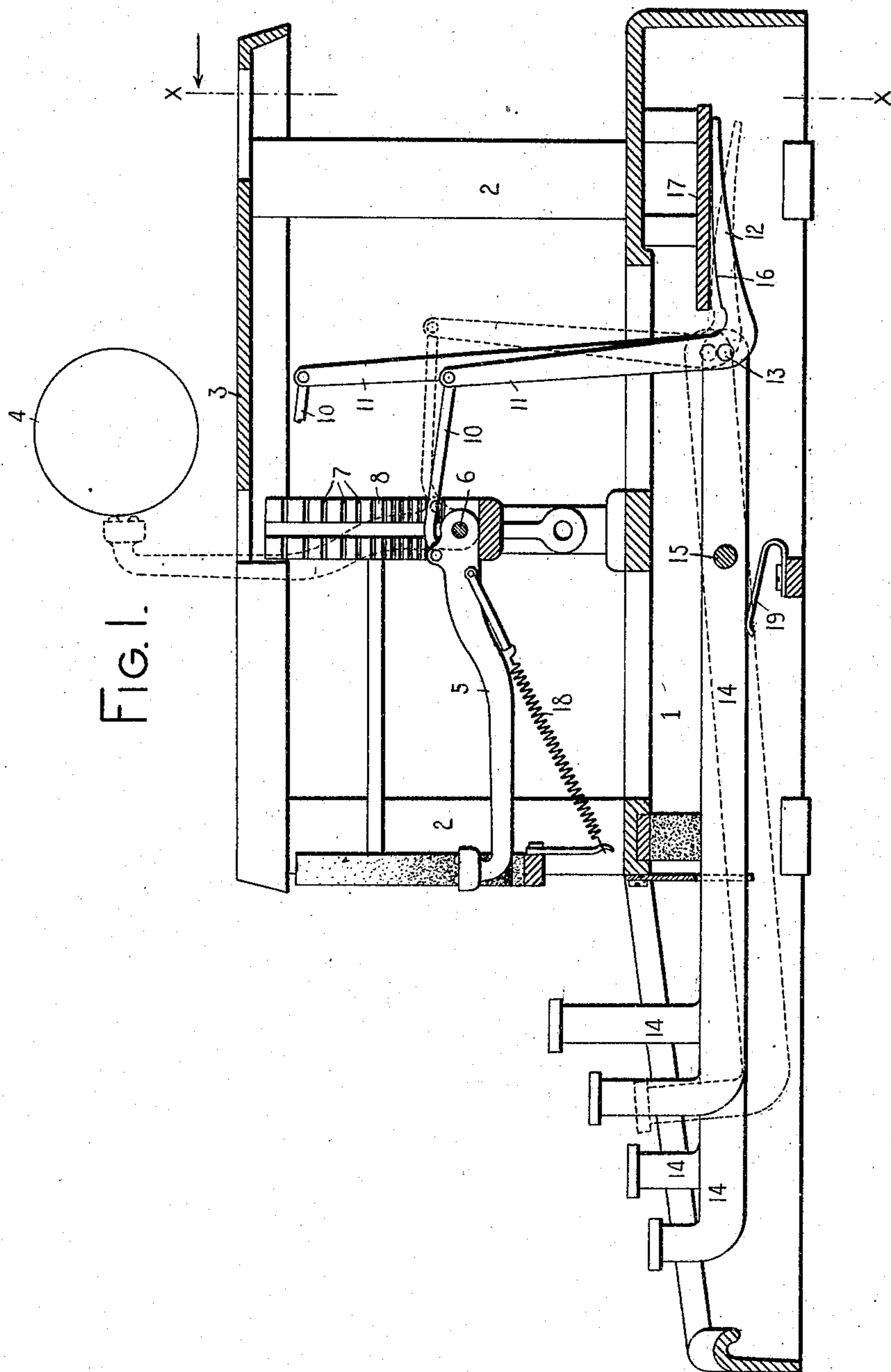


No. 855,144.

PATENTED MAY 28, 1907.

B. C. STICKNEY.
TYPE WRITING MACHINE.
APPLICATION FILED OCT. 14, 1903.

2 SHEETS--SHEET 1.



WITNESSES:

K. V. Alonovan.

M. F. Hansweber.

INVENTOR.

Burham C. Stickney

by Jacob Gelbo

HIS ATTORNEY

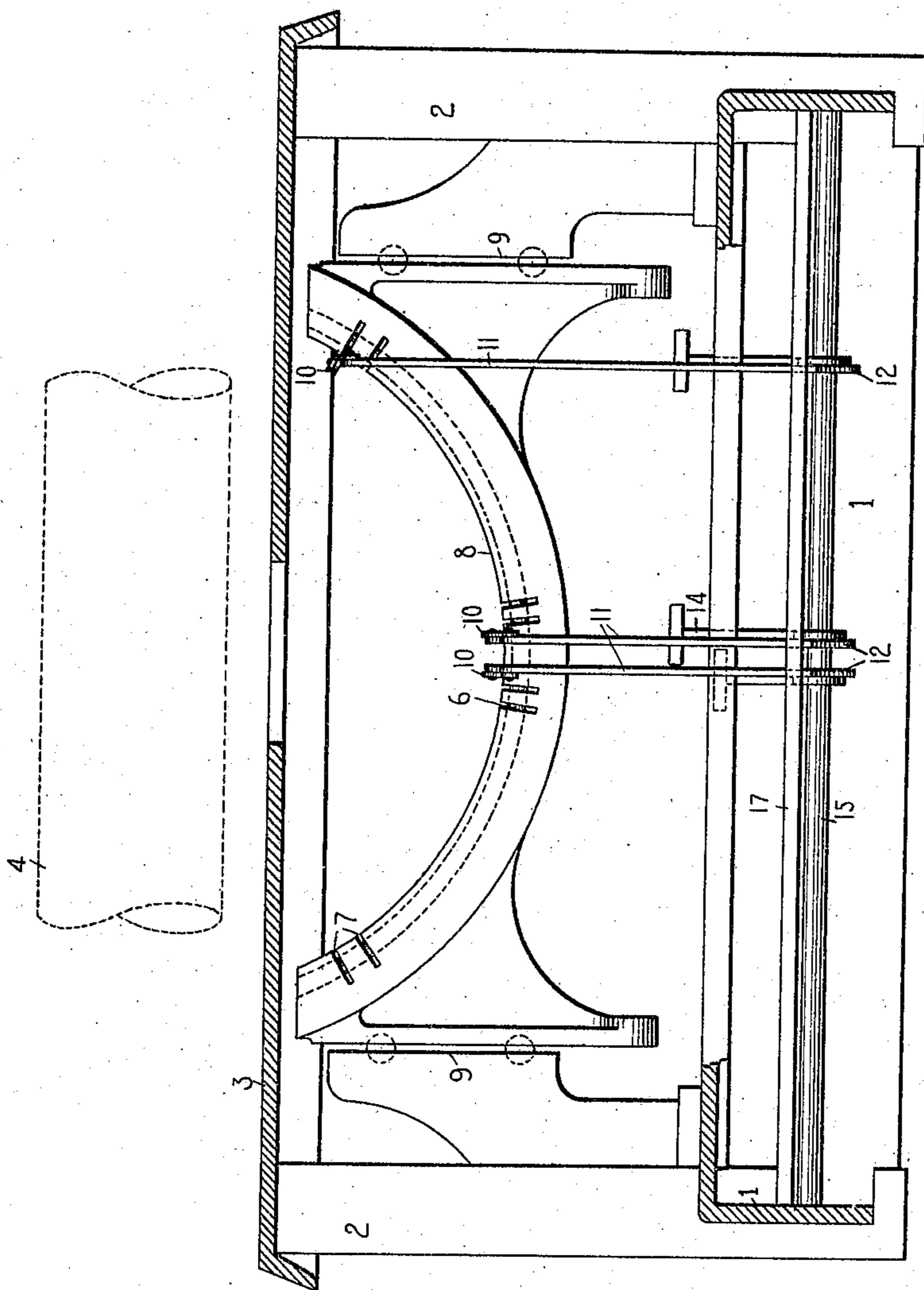
No. 855,144.

PATENTED MAY 28, 1907.

B. C. STICKNEY.
TYPE WRITING MACHINE.
APPLICATION FILED OCT. 14, 1903.

2 SHEETS—SHEET 2.

FIG. 2.



WITNESSES:

K. V. Donovan.
M. F. Hanswicker.

INVENTOR.

Burham C. Stickney
by Jacob F. Feltel
HIS ATTORNEY

UNITED STATES PATENT OFFICE.

BURNHAM C. STICKNEY, OF ELIZABETH, NEW JERSEY, ASSIGNOR TO UNION TYPEWRITER COMPANY, OF JERSEY CITY, NEW JERSEY, A CORPORATION OF NEW JERSEY.

TYPE-WRITING MACHINE.

No. 855,144.

Specification of Letters Patent.

Patented May 28, 1907.

Application filed October 14, 1903. Serial No. 177,001.

To all whom it may concern:

Be it known that I, BURNHAM C. STICKNEY, a citizen of the United States, and a resident of Elizabeth, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

This invention relates to type bar machines, and particularly those of the front strike variety; and its object is to provide improved means for so connecting the keys to the type bars as to diminish the leverage of the former upon the latter during the printing strokes, thereby to cushion the key strokes and improve the type impressions.

In the drawings forming part of this specification, Figure 1 is a central longitudinal sectional view of a front strike writing machine made in accordance with my present improvements; one type action being shown in full lines in normal position, and another in dotted lines in printing position. Fig. 2 is a rear sectional elevation taken at about the line $x-x$ of Fig. 1.

Similar parts are identified by similar signs throughout the views.

The frame of the machine may comprise a base 1, corner posts 2, and top plate 3, over which may run a carriage bearing a platen 4. Rearwardly striking type bars 5 are pivoted in an arc upon a curved fulcrum rod 6 and work in radial slots 7 cut in a segment 8, which is adapted to shift vertically in guides 9 for enabling different types to print. Each type bar is connected by a rearwardly extending link 10 to the upright arm 11 of an elbow lever, which comprises also a rearwardly extending arm 12, and is pivoted at 13 to the rear end of one of a system of key-bearing levers 14. It will be seen that the various pivots 13 are situated in a single transverse plane. The levers 14 are levers of the first order, and are pivoted in a single transverse plane upon a transverse rod 15. The upper edges of the arms 12 are provided with elongated curved treads or rockers 16 adapted to bear up against the under side of a common horizontal fulcrum bar 17, and to roll forwardly therealong during the printing strokes of the type bars.

At the beginning of the stroke, the remote or rear end of the arm 12 is in contact with

the fulcrum bar, as indicated in full lines, whereby the leverage of the key upon the type bar is maximum at the first part of the key stroke; but during the remainder thereof the arm rocks or rolls along the bar, its point of contact therewith gradually shifting in a forward direction until the type strikes the platen, at which moment the forward end of the arm 12 is in contact with the fulcrum bar, as shown in dotted lines. At this point the leverage of the key upon the type bar is least. Thus at the beginning of the stroke, the movement of the type bar is very slight relatively to that of the key, thereby avoiding a jar to the finger and cushioning the stroke; while at the termination of the stroke the movement of the type bar is accelerated relatively to that of the key, thereby tending to absorb the momentum of the hand of the operator and to ease the latter part of the key stroke; while owing to its increased speed, the type bar is caused to deliver a powerful blow against the platen. It will be observed that the type actions are simple in construction and operation, as well as compact and inexpensive to manufacture.

The arms 11 of the elbow levers are of graduated lengths, being shortest in the middle of the system and of gradually increasing lengths from the middle to the sides of the system; while the arms 12 are in a like manner made of different lengths and corresponding curvatures, thus affording a uniform leverage, "touch" and dip throughout the system. The type bars are provided with returning springs 18 and the key levers may also be provided with returning springs 19, although the latter may be omitted if desired, but as their action upon the key is direct, not affected by the change in the leverage during the key stroke, I prefer to use them, as they have a more uniform action on the keys than the springs 18.

Variations may be resorted to within the scope of my invention and portions of my improvements may be used without others.

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

1. The combination with a type bar, of a key lever of the first order, a sub-lever pivoted to said key lever, one of said levers having an elongated tread, a fulcrum whereon said

tread operates so as to afford a changing leverage during the printing stroke of the type bar, and a connection from said sub-lever to the type bar.

2. The combination with a type bar, of a key lever pivoted intermediate of its ends, a sub-lever pivoted to the rear end portion of said key lever and connected to said type bar, said sub-lever having an elongated tread, and a fulcrum whereon said tread operates so as to afford a changing leverage during the printing stroke of the type bar, to diminish the leverage of the key upon the type bar.

3. In a front-strike writing machine, the combination with a rearwardly striking type bar, of a key lever pivoted intermediate of its ends to form a lever of the first order, an elbow lever pivoted at the rear end portion of said key lever and connected to the type bar; said elbow lever having a rearwardly extending elongated tread; and a fulcrum whereon said tread rolls to afford a changing leverage during the printing stroke of the type bar.

4. In a front strike writing machine, the combination with a rearwardly striking type bar, of a key lever of the first order; an elbow lever pivoted thereto and comprising an upwardly extending arm which is connected to the type bar and also a rearwardly extending arm having an elongated tread upon its upper edge; and a fulcrum whereon said tread rolls during the printing stroke; one of said tread and fulcrum elements being curved.

5. In a front strike writing machine, the combination with a rearwardly striking type bar, of a key lever of the first order, an elbow lever pivoted thereto comprising an upwardly extending arm which is connected to the type bar and also a rearwardly extending arm having an elongated tread upon its upper edge; and a fulcrum whereon said tread rolls during the printing stroke; one of said tread and fulcrum elements being curved, and said type bar being shiftable to enable different type to print.

6. In a typewriting machine, the combination of a series of segmentally arranged type bars, a series of key levers of the first order, a series of sub-levers pivoted to and carried by said key levers and both sets of arms of which are progressively longer from the center to the sides of the series of sub-levers.

7. In a front-strike typewriting machine, the combination of a series of segmentally arranged rearwardly striking type bars, a series of key levers of the first order, a series of elbow sub-levers pivoted to and carried by said key levers, each of said sub-levers having an upwardly extending arm that is operatively connected to a type bar, and a fulcrum arm that extends in the general direction of the length of the associated key lever, both sets of arms increasing in length from the center to the sides of the system of sub-

levers, and a fulcrum against which the fulcrum arms bear and on which they have a rolling action to afford a changing leverage during the printing strokes.

8. In a front-strike typewriting machine, the combination of a series of segmentally arranged rearwardly striking type bars, a series of key levers of the first order, the pivots of which are in a single transverse plane, a series of elbow sub-levers pivoted to the rear ends of and carried by said key levers, each of said sub-levers having an upwardly extending arm that is operatively connected to a type bar, and a rearwardly extending fulcrum arm, both sets of arms increasing in length from the center to the sides of the system of sub-levers, and a fulcrum against which the rearwardly extending fulcrum arms bear and on which they have a rolling action to afford a changing leverage during the printing strokes.

9. In a front-strike typewriting machine, the combination of a series of segmentally arranged rearwardly striking type bars, a series of key levers of the first order, the pivots of which are in a single transverse plane, a series of elbow sub-levers pivoted to the rear ends of said key levers in a single transverse plane, each of said sub-levers having an upwardly extending arm, a link connecting each of said upwardly extending arms to a type bar, a rearwardly extending fulcrum arm on each sub-lever, both sets of arms of the sub-levers increasing in length as the sides of the system of sub-levers are approached, and a fulcrum against which the rearwardly extending fulcrum arms bear and on which they have a rolling action to afford a changing leverage during the printing strokes.

10. In a front-strike typewriting machine, the combination of a series of segmentally arranged rearwardly striking type bars, a series of key levers pivoted intermediate of their ends and the pivots of which are in a single transverse plane, a series of elbow sub-levers pivoted to the rear ends of said key levers in a single transverse plane, each of said sub-levers having an upwardly extending arm and a rearwardly extending fulcrum arm that projects beyond the associated key lever and in the general direction of the length thereof, a series of links which connect the said upwardly extending arms to the type bars, a fulcrum with which fulcrum arms co-operate and on which they have a rolling action to vary the leverage during the printing strokes, and curved contact faces between the said fulcrum arms and fulcrum, both sets of arms of said elbow sub-levers increasing in length from the center to the sides of the system.

11. In a front-strike typewriting machine, the combination of a series of segmentally arranged rearwardly striking type bars, a se-

ries of key levers of the first order, a series of
elbow sub-levers pivoted to the rear ends of
said key levers and with their pivots in a sin-
gle transverse plane, each of said sub-levers
5 having an upwardly extending arm and a
rearwardly extending fulcrum arm that pro-
jects beyond the associated key lever and in
the general direction of the length thereof, a
series of links which connect the said up-
10 wardly extending arms to the type bars, a
fulcrum with which fulcrum arms co-operate,
and on which they have a rolling action to
vary the leverage during the printing strokes
curved contact faces between the said ful-

crum arms and fulcrum, both sets of arms of 15
said elbow sub-levers being shorter at the
center of the system than they are at the
sides, and means which afford a shift of the
type bars to change the case position thereof
for upper and lower case writing. 20

Signed at the borough of Manhattan, city
of New York, in the county of New York, and
State of New York, this 12th day of October
A. D. 1903.

BURNHAM C. STICKNEY.

Witnesses:

E. M. WELLS,

M. F. HANSUREBER.