

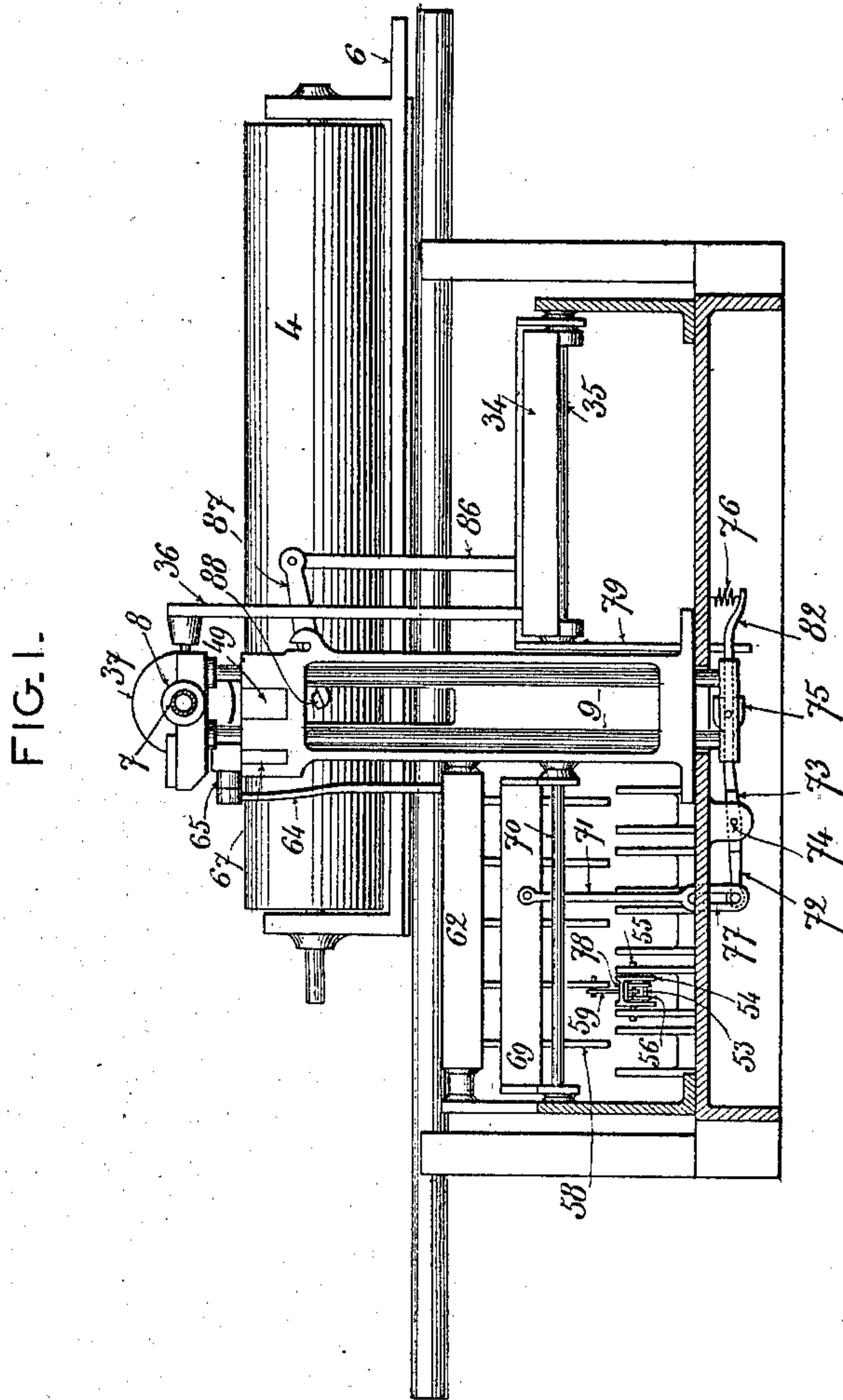
No. 681,036.

Patented Aug. 20. 1901.

H. BURG.
TYPE WRITING MACHINE.
(Application filed Jan. 18, 1901.)

(No Model.)

5 Sheets—Sheet 1.



Witnesses:
Paul Hunter
A. H. Davis

Inventor
Hubert Burg
By *Munn*
Attorneys

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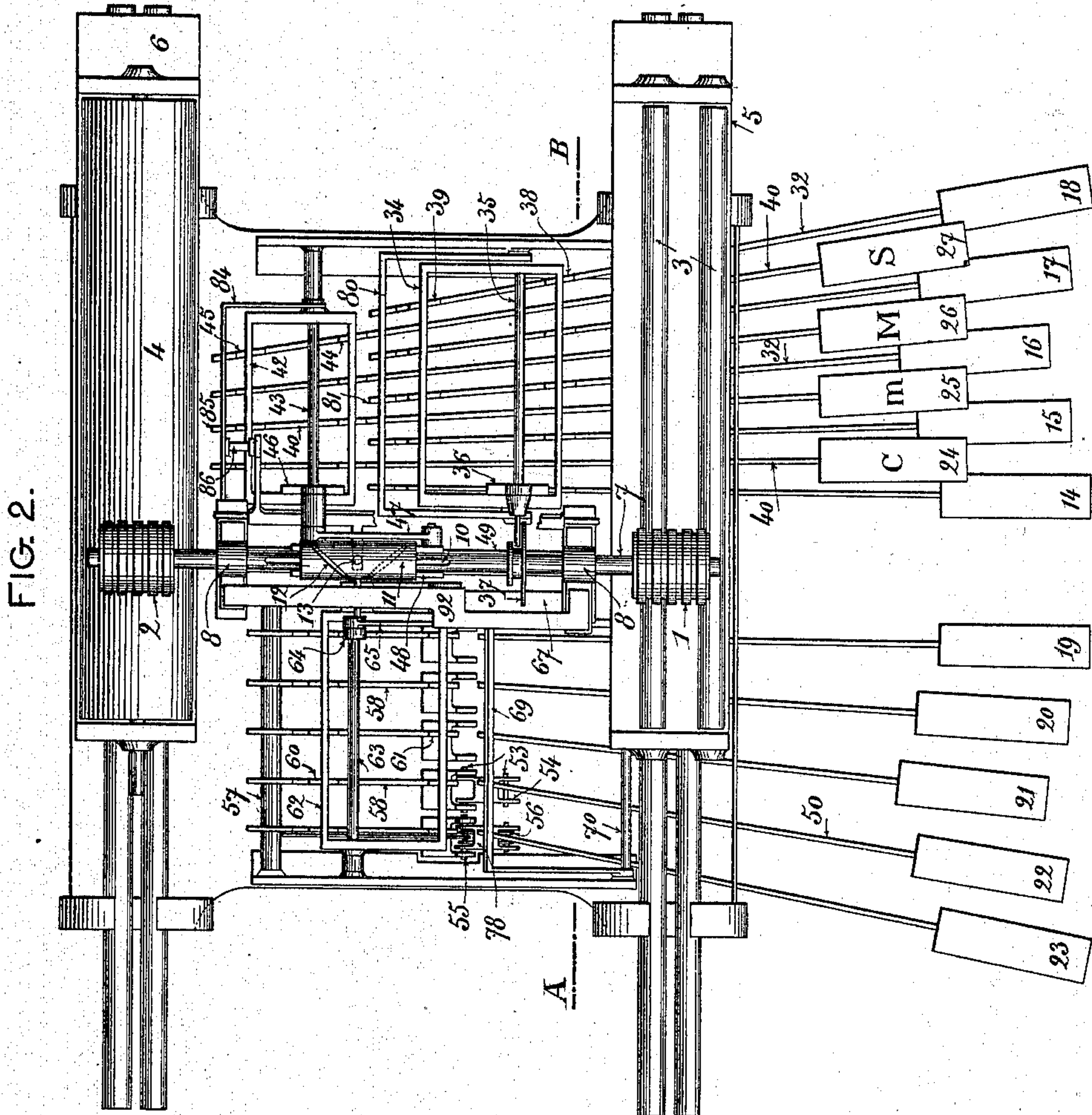
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Paul Hunter
A. J. Davis

Inventor
Hubert Burg
By *Munn*
Attorneys

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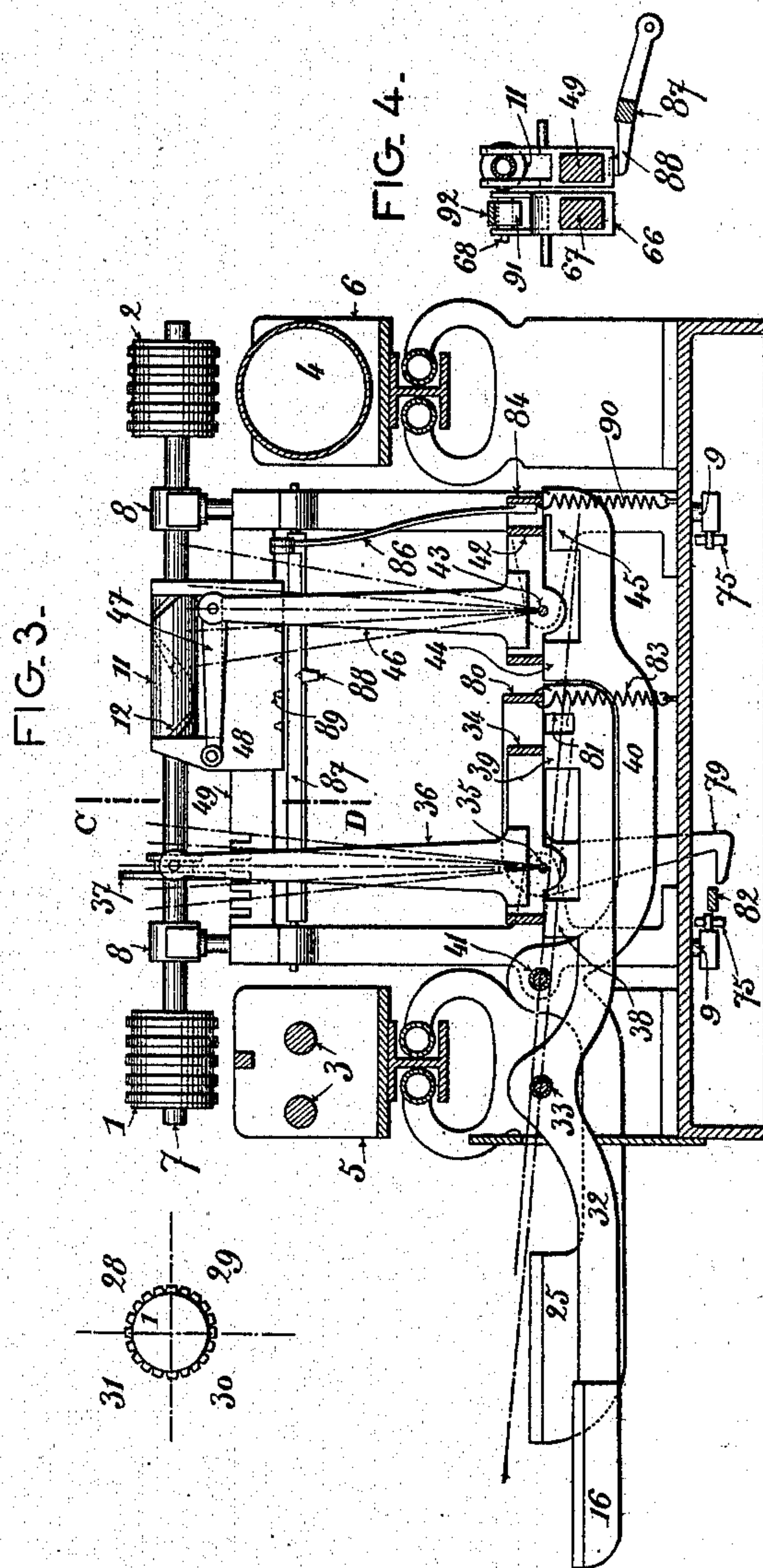
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Witnesses:
Paul Hunter
A. J. Davis

Inventor
Hubert Burg
By  *Attorneys*

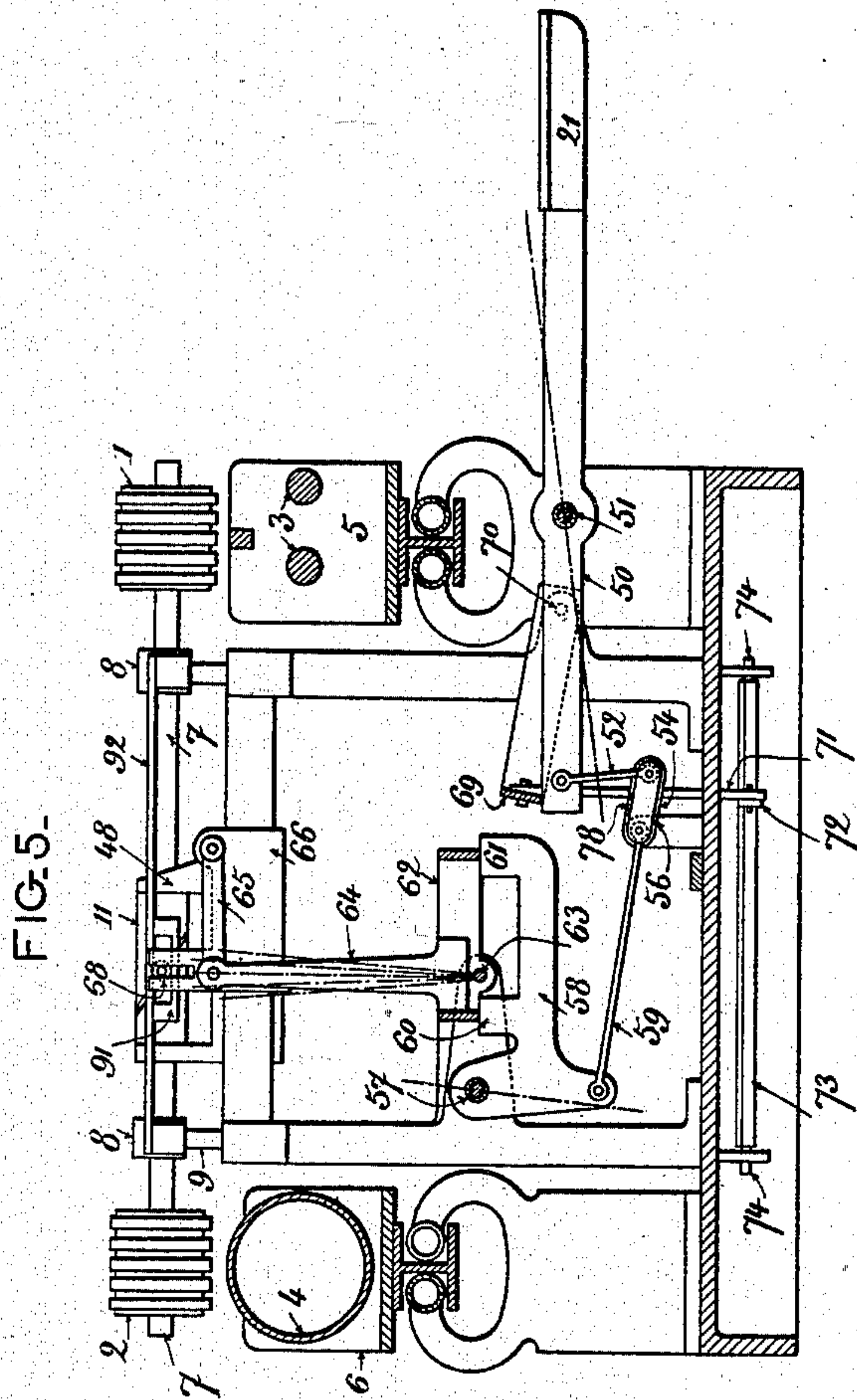
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5 Sheets—Sheet 4.



Witnesses:
P. Hunter
A. H. Davis

Inventor
Hubert Burg
By *Munn*
Attorneys

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5 Sheets—Sheet 5.

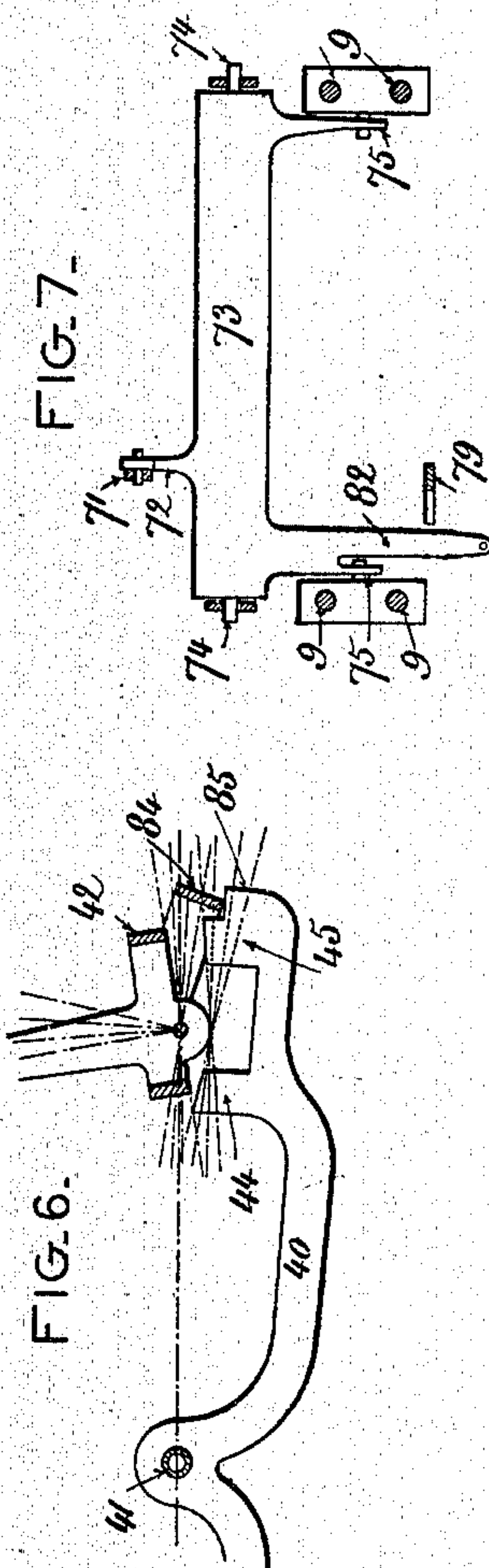
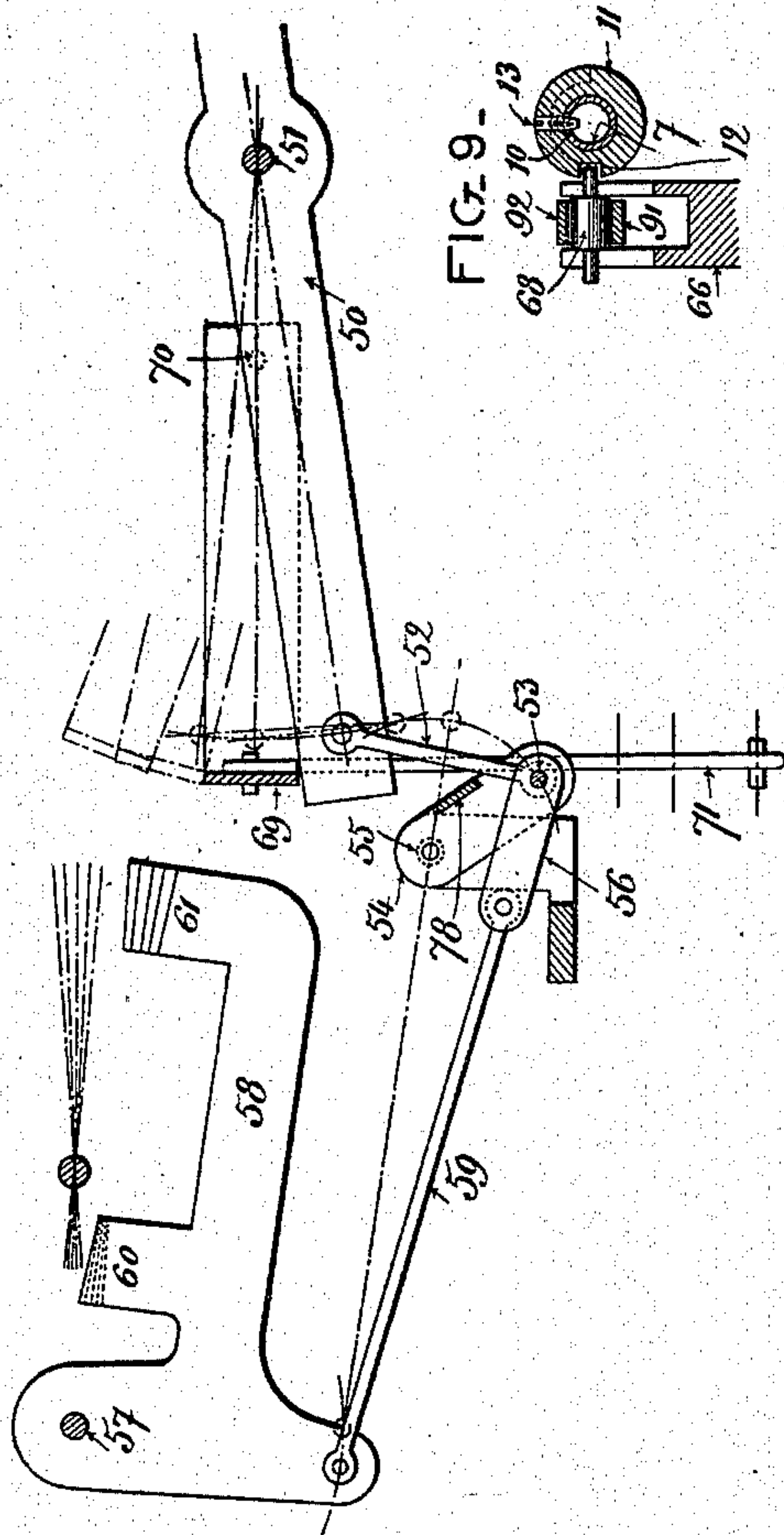


FIG. 8.



Witnesses:
T. H. Hunter
A. H. Davis

Inventor
Hubert Burg
By *M. H. Davis*
Attorneys

UNITED STATES PATENT OFFICE.

HUBERT BURG, OF MOLLKIRCH, GERMANY.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 681,036, dated August 20, 1901.

Application filed January 18, 1901. Serial No. 43,788. (No model.)

To all whom it may concern:

Be it known that I, HUBERT BURG, a citizen of the German Empire, residing at Mollkirch, canton of Rosheim, Alsace, in the German Empire, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

My invention relates to type-writing machines in which the printing is effected by means of characters formed on the periphery of a barrel, to which movements of rotation and translation are imparted.

The object of my invention is to so arrange the mechanisms as a whole as to provide a machine of this class which shall be easy to operate rapidly, simple in construction, and comprising but few keys when the large number of characters is considered.

The mechanical arrangements for which I desire to obtain Letters Patent have for their object, in the first place, to impart rotary movements to the barrel by means of a small number of simple devices, while obtaining at the same time a comparatively large number—twenty, for example—of positions different as to the direction of displacement, and, in the second place, to avoid any of the parts of the mechanism coming together or being interfered with and injured through the simultaneous operation of several keys.

To make my invention perfectly clear, I have shown in the accompanying drawings and by way of example one form of my improved type-writing machine. In the said drawings I have shown in diagram the parts the arrangement of which forms no feature of my invention, such parts being the paper-rollers, the carriages, &c., and certain secondary parts of well-known construction are omitted in the said drawings.

Figure 1 is a vertical section on the line A B, Fig. 2, the key-levers being removed. Fig. 2 is a plan view. Fig. 3 is a vertical section showing the right-hand side of the machine. Fig. 4 is a part-sectional view on the line C D of Fig. 3. Fig. 5 is a vertical section showing the left-hand side of the machine. Fig. 6 shows the details of a device for operating a carriage moving a threaded sleeve on the spindle of the character or type barrels. Fig. 7 is a plan of an oscillating frame located under the main frame of the machine. Fig. 8

is a detail view of a mechanism for causing the barrels to turn and effect the printing. Fig. 9 is a sectional view of the threaded sleeve.

The type-writing machine shown comprises two type-barrels 1 and 2, intended to produce simultaneously identical impressions on sheets of paper or a continuous strip passing over the rollers 3 and 4 of the carriages 5 and 6; but the machine might comprise a single barrel and a single roller without modifying the principle of my invention. The barrels 1 and 2 are fixed to a horizontal spindle 7, free to revolve and slide in bearings 8, carried by rods 9, free to move up and down in slideways in the main frame of the machine. In the said spindle 7 is provided a groove 10, serving as a guide for a slidable sleeve 11, the surface of which is provided with a screw-thread of long pitch 12. A screw 13, screwed into the sleeve 11 and engaged in the groove 10, prevents the said sleeve from rotating relatively to the spindle 7.

The characters or types formed in relief on the barrels 1 and 2 are arranged in generating-lines and parallel circles. In the machine shown in the drawings each barrel comprises five parallel circles and twenty generatrices, or one hundred characters in all. To bring any one of the said characters above the printing-point it will be necessary to impart to the spindle 7 a movement of longitudinal translation and a rotary movement around its axis. These movements are produced by means of keys pressed by the fingers and divided into three groups. One group of keys 14 15 16 17 18, placed on the right-hand side of the keyboard, serves to produce the longitudinal movements of the barrels. A second group of keys 19 20 21 22 23, located on the left-hand side, serves to produce the angular movements of the barrels of slight amplitude or those corresponding to one, two, three, or four generatrices. The third group of keys 24 25 26 27 serves to produce the angular movements of greater amplitude or those corresponding to one-quarter, one-half, or three-quarters of a revolution of the barrels.

The surface of a barrel 1 may be considered as being composed of several cylindrical segments 28 29 30 31 or letter-fields, as indicated in a separate view on the drawings ad-

5 adjacent to Fig. 3, each of which letter-fields or
 type groups corresponds, respectively, to one
 of the keys 24 to 27 of the third above-de-
 scribed group. When one of the said keys—
 10 26, for example—is pressed, the corresponding
 letter-field 30 is brought to the lower part of
 the barrel opposite the printing-roller. The
 two other groups of keys are for the purpose
 of determining the position of a character of
 15 the said letter-field 30 in such a manner that
 it comes exactly above the printing-point.
 This result is obtained by pressing one of the
 keys 19 to 23, which causes the barrel to ro-
 tate to a slight extent, which is inferior to the
 20 width of the field, and by pressing simultane-
 ously one of the keys 14 to 18, which causes
 the barrel to move lengthwise.

The keys 14 to 18 are carried by key-levers
 32, oscillating on a spindle 33, Fig. 3, and the
 20 forward ends of which are located under a
 frame 34, so mounted as to be free to oscillate
 around a horizontal spindle 35. On one of
 the sides of the said frame is fixed a lever 36,
 the end of which engages in the groove of a
 25 collar 37, fixedly attached to the spindle 7, so
 that the latter can be shifted lengthwise a
 longer or shorter distance, according to the
 more or less inclined position taken by the
 frame 34.

30 To modify the inclination of the frame 34,
 each of the key-levers 32 is provided with two
 upward projections 38 and 39, located under
 the front and back sides of the frame 34, the
 heights of the said projections being so regu-
 35 lated that when the five levers 32, correspond-
 ing to the five keys 14 to 18, are operated suc-
 cessively the said frame takes five different
 inclinations, to which correspond five differ-
 ent longitudinal positions of the spindle 7
 40 and of the barrels 1 and 2.

The keys 24 to 27 are mounted on key-le-
 vers 40, oscillating around a spindle 41 and
 acting in a similar manner on a frame 42,
 movable around a spindle 43. The said key-
 45 levers 40 are provided with the upward pro-
 jections 44 and 45, acting on two opposite
 sides of the frame 42 and serving to give the
 latter as many different inclinations as there
 are levers 40. On one of the sides of the frame
 50 42 is fixed a lever 46, connected by a pitman
 47 to a carriage 48, sliding on a guide-bar 49,
 parallel to the spindle 7. The said carriage
 48 forms a sort of cage for the sleeve 11, on
 which cage the sleeve has but small longitu-
 55 dinal play. It will be understood that the op-
 eration of each key 24 to 27 gives a particu-
 lar inclination to the frame 42, and conse-
 quently a particular position to the carriage
 48 and to the sleeve 11.

60 The mechanism operated by the keys 19 to
 23 is based on the same principle as the pre-
 vious ones; but it comprises a particular ar-
 rangement which permits of using a part of
 the stroke of the key-levers 50 for causing the
 55 barrels 1 and 2 to turn and another part of
 the stroke for moving the said barrels down
 onto the printing-rollers. Each of the key-

levers 50, pivoted on a spindle or rod 51, is
 connected by a pitman 52 to the crank-pin 53
 of a crank 54, turning around a fixed spindle 70
 55, Fig. 8. To the said crank-pin is also piv-
 oted a pitman 56 of the same length as the
 pitman 54.

On a fixed spindle 57 are pivoted five elbow-
 levers 58, connected by pitmen 59 to the cor- 75
 responding pitmen 56, and provided each with
 projections 60 and 61, located, respectively,
 under the front and back sides of a frame 62,
 oscillating around a spindle 63. The heights
 of the projections 60 and 61 are so regulated 80
 that the frame 62 will be brought into five
 different positions when the five keys 19 to
 23 are operated successively. To the said
 frame 62 is fixed a lever 64, which is con-
 nected by a pitman or link 65 to a carriage 85
 66, slidable on a guide-bar 67, fixed to the
 main frame parallel to the spindle or rod 7.
 The said carriage carries forward with it the
 stud of a roller 68, Fig. 9, running in a guide-
 way 91, fixed to a cross-rod 92, connecting the 90
 two bearings 8. One of the ends of the stud
 or spindle of the roller 68 is engaged in the
 screw-thread 12 of the sleeve 11. For a de-
 termined position of the carriage 66 the sleeve
 11 can be turned into five different positions 95
 by the longitudinal displacement of the roller
 68 into five corresponding positions when the
 five keys 19 to 23 are successively operated.

Above the key-levers 50 is arranged a frame
 69, oscillating on a spindle 70 and connected 100
 by a pitman or link 71 to a lever 72, integral
 with an oscillating cross-bar 73, Fig. 7, mount-
 ed on pivots 74. Two levers 75, integral with
 the said cross-bar 73, are pivoted to the ver-
 tically-sliding bars 9, so that when the frame 105
 69 is lifted by any one of the key-levers 50
 the cross-bar 73 oscillates and causes the rods
 9, the spindle 7, and the barrels 1 and 2 to
 move down. A spring 76 constantly tends to
 draw upward the rods 9, the spindle 7, and 110
 the barrels.

For the purpose of producing successively
 the longitudinal displacement of the carriage
 66 and the lowering of the barrels the pitman
 or link 71 is provided with a slideway 77, Fig. 115
 1, whereby the lever 72 is only operated dur-
 ing the last part of the upward stroke of the
 frame 69. On the other hand, in order that
 the frame 62, operated by any one of the le-
 vers 58, shall remain in contact with the pro- 120
 jections 60 and 61 after the first part of the
 oscillation of the corresponding key-lever 50
 a striking-lug 78 is formed on each of the
 crank-arms 54, so as to prevent the pitman
 or link 56 from turning relatively to the said 125
 crank-arm 54 beyond the position in which
 the joint between the said link 56 and the
 link 59 coincides with the axis of rotation 55
 of the crank-arm.

In order not to produce the impression until 130
 after the barrels 1 and 2 have been brought
 into the desired position, a bolt or catch 79
 is so arranged as to prevent the oscillation of
 the cross-bar 73 when the keys 14 to 18 are in

their position of rest and to allow of the said oscillation when any one of the said keys is pressed down almost completely. For that purpose the catch 79 is integral with a frame 80, free to oscillate on the spindle 35 and one side of which is located opposite the projections 81, formed on the ends of the key-levers 32. When one of the latter strikes the frame 80, the latter becomes inclined and the catch 79 releases a lever 82, integral with the cross-bar 73. The latter can then be operated to produce the printing. The catch 79 and the frame 80 are then brought back into their initial position by a spring 83, when the pressure ceases on the key-lever.

To lock the carriage 48 each time it is brought into a fresh position, I may arrange on the spindle 43 a frame 84, one side of which is located opposite the projections 45, formed on the ends of the key-levers 40, Fig. 6. The said frame is connected by a link 86 to an oscillating piece 87, provided with a stop-finger 88, capable of becoming engaged in any one of the four holes 89 in the carriage 48 corresponding to the four positions which the said carriage is capable of taking. When one of the keys 24 to 27 is pressed down, the corresponding key-lever 40 lifts the frame 84 and through the medium of the link 86 causes the piece 87 to oscillate in such a manner as to disengage the finger 88 from a hole 89. When the pressure ceases on the key, the frame 84 is brought back by a spring 90, and the finger 88 rises ready to become engaged with another hole 89.

The feed of the printing-carriages 5 and 6 and the unwinding of an inked ribbon or the inking of the barrels may be produced in any well-known manner each time one of the keys 14 to 18 is operated, as in the type-writing machines now in use.

The operation of the machine is as follows: Before printing a type or character the carriage 48 must be brought, by means of one of the keys 24 to 27, into the proper position to allow of the letter-field containing the desired character being ulteriorly displaced relatively to the printing-roller by means of other keys in order to bring the desired character exactly above the printing-point. For that purpose the keys 24 to 27 may correspond, respectively, to figures, to capital letters, to small letters, and to signs. The segments 28 to 31 of a barrel carry characters corresponding to the said keys whether the said characters be, respectively, figures, capital letters, small letters, or signs. After one of the keys 24 to 27 has been pressed down it may be released, and the carriage 48, locked by the finger 88, remains in the position into which it is brought. When pressure is simultaneously exerted on one of the keys 14 to 18 and on one of the keys 19 to 23, the key 16, for example, being moved down with its lever 32, the frame 34, operated by the two projections 38 and 39, takes a determined inclination and remains invariably in that

position so long as downward pressure is exerted on the key 16. The lever 36 thus displaces the spindle 7 by means of the collar 37 and brings the barrels 1 and 2 into a position for which the circular row of type containing the desired character will be located above the line of printing. In pressing down a second key—21, for example—the corresponding key-lever 50 displaces the crank 54, as shown in Fig. 8. The corresponding lever 58 is at first operated by the links 56 and 59 and then remains motionless as soon as the link 56 rests against the abutment 78. In that position the lever 58 rests, through the medium of its projections 60 and 61, against the frame 62 and holds the carriage 66 in a position for which the stud of the roller 68 has so set the sleeve 11, as well as the spindle 7 and the barrels 1 and 2, that the desired character is located exactly above the printing-point. The twenty-five characters of each letter-field can thus be brought to the printing-point by operating, two by two, the keys 14 to 18 and 19 to 23, according to twenty-five different coördinations. By continuing to exert pressure on the key 21 the frame 69 is sufficiently lifted to operate the cross-bar 73 and move down the spindles 7 and 9 and the barrels to do the printing. When the keys are released, the corresponding levers move back into their initial position, but the frames 34, 42, and 62 remain free in the position into which they have previously been brought. The spindle 7 and the barrels move up through the action of the spring 76.

As will be seen, the mechanism for operating the barrels comprises three similar parts composed of a small number of elements or members and easily constructed. The arrangement of the key-levers in combination with the frames has the particular advantage of preventing any coming together, wedging, or injury of the parts when two or more keys belonging to the same group are operated simultaneously. Finally, the application of special mechanism to shift the letter-field presented to the action of coördination with two other mechanisms has the very great advantage of supplying a great number of characters, while greatly reducing at the same time the number of keys.

I claim—

1. A type-writing machine, comprising type-barrels fixedly attached to a spindle capable of sliding freely in its bearings, a screw-threaded sleeve sliding on the said spindle and guided by a groove in the latter, a collar fixedly attached to the spindle, a carriage sliding parallelly to the said spindle and carrying along with it the screw-threaded sleeve, a carriage sliding parallelly to the spindle and carrying along with it a finger engaged in the screw-thread of the sleeve, and mechanisms operated by keys to displace respectively the said collar and the two carriages.

2. In a type-writing machine barrels provided with type arranged in sets or fields, a

device for shifting the type-field of the barrels, comprising a sliding carriage 48, forming a cage in which is engaged a sleeve 11 provided with a screw-thread engaged on a
5 finger carried by another carriage, the said sleeve being free to slide on the spindle 7, which carries the barrels, and carrying the said spindle around with it when it revolves.

3. In a type-writing machine movable type-
10 barrels, a carriage, a screw-threaded sleeve held to move with the carriage, mechanisms for displacing or shifting longitudinally the barrels and the carriage of the screw-threaded sleeve, comprising projections of different
15 heights formed on the key-levers, and an oscillating frame against which the said projections can abut, whereby each lever holds the frame in a fixed position when it is operated and leaves the said frame free when it is
20 abandoned by the operator, as hereinbefore described.

4. In a type-writing machine, a barrel mounted to revolve and to move up and down, key-levers, a device allowing the use of a part

of the stroke of the corresponding key-levers 25 to cause the barrels to turn without moving down, and the use of another part of the stroke of the said levers to move the barrels down without the latter being able to turn, the said device comprising a crank con- 30 nected to each key-lever, a pitman or link pivoted or jointed to the crank-pin and of the same length as the said crank, and an abutment stopping the pitman or link when its axis is parallel to that of the crank, whereby 35 the mechanism coöperating with the pitman or link remains motionless after the latter has come against the abutment, while the type-barrels can then be moved down by means of a rod provided with a slideway, as 40 hereinbefore described.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

HUBERT BURG.

Witnesses:

EDMOND BLÉTRY,
EUGÈNE WATTIER.