

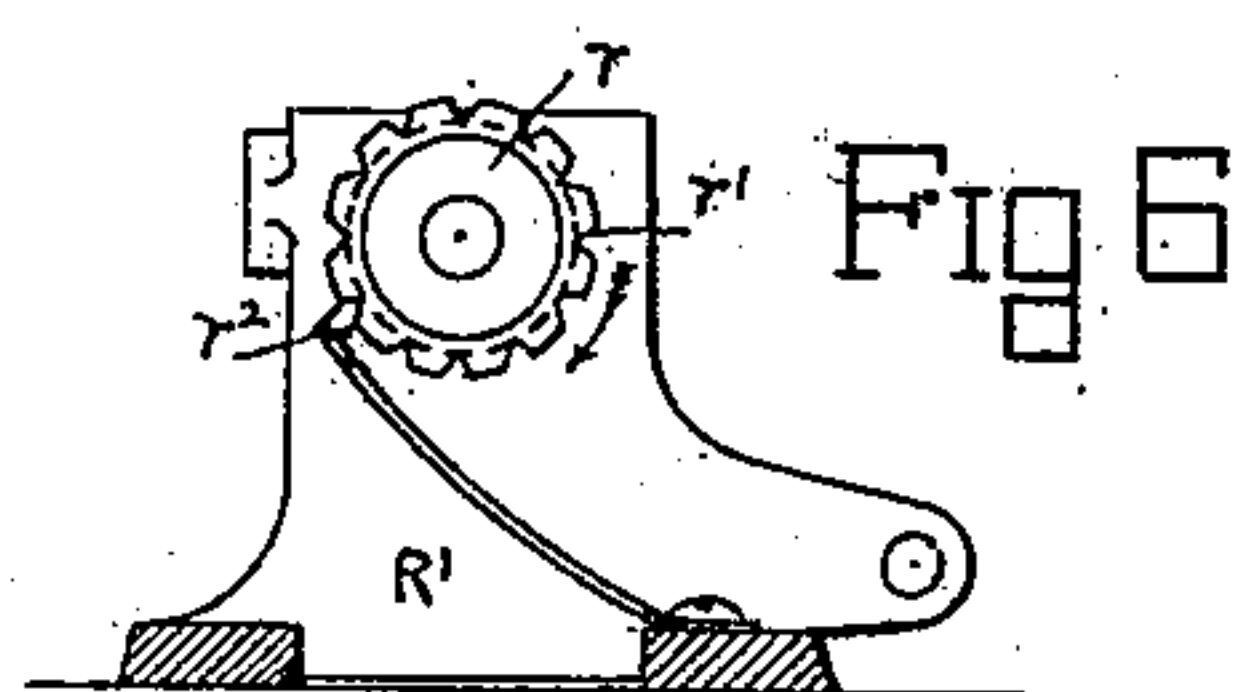
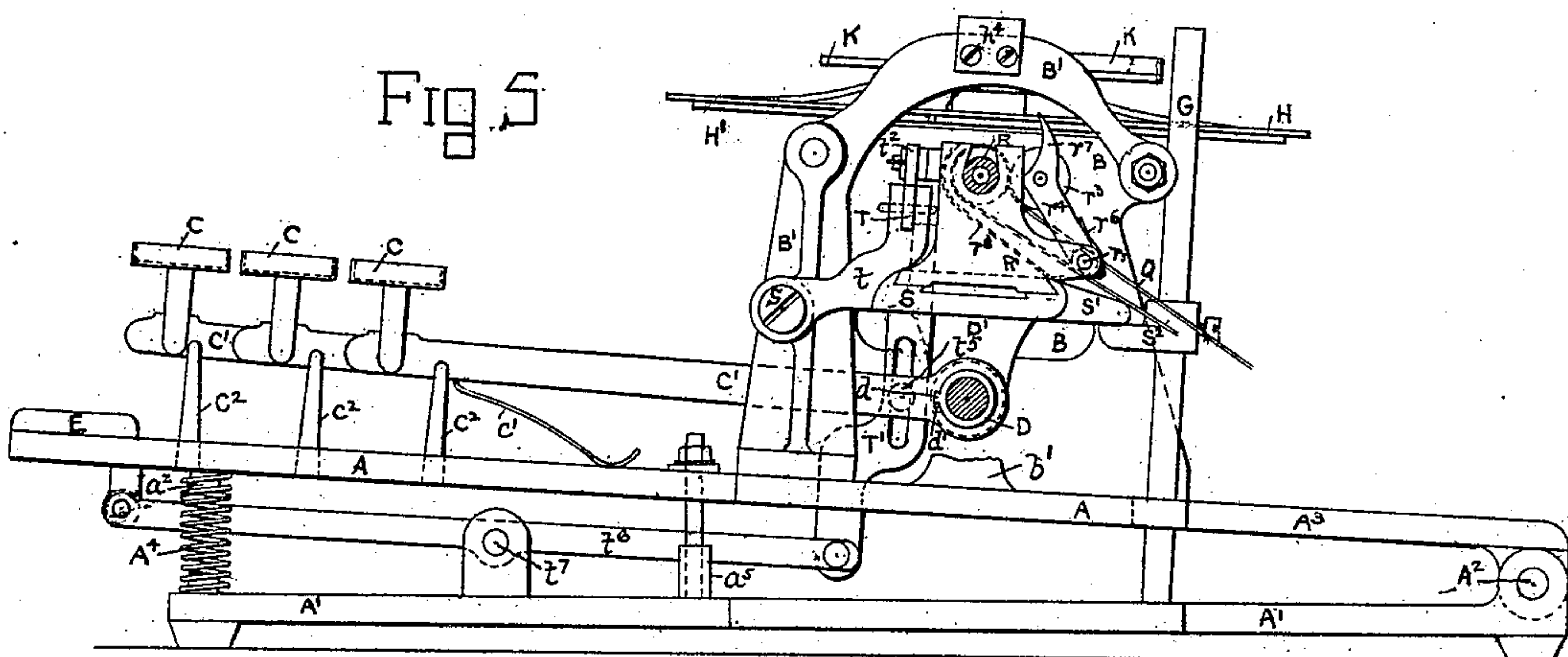
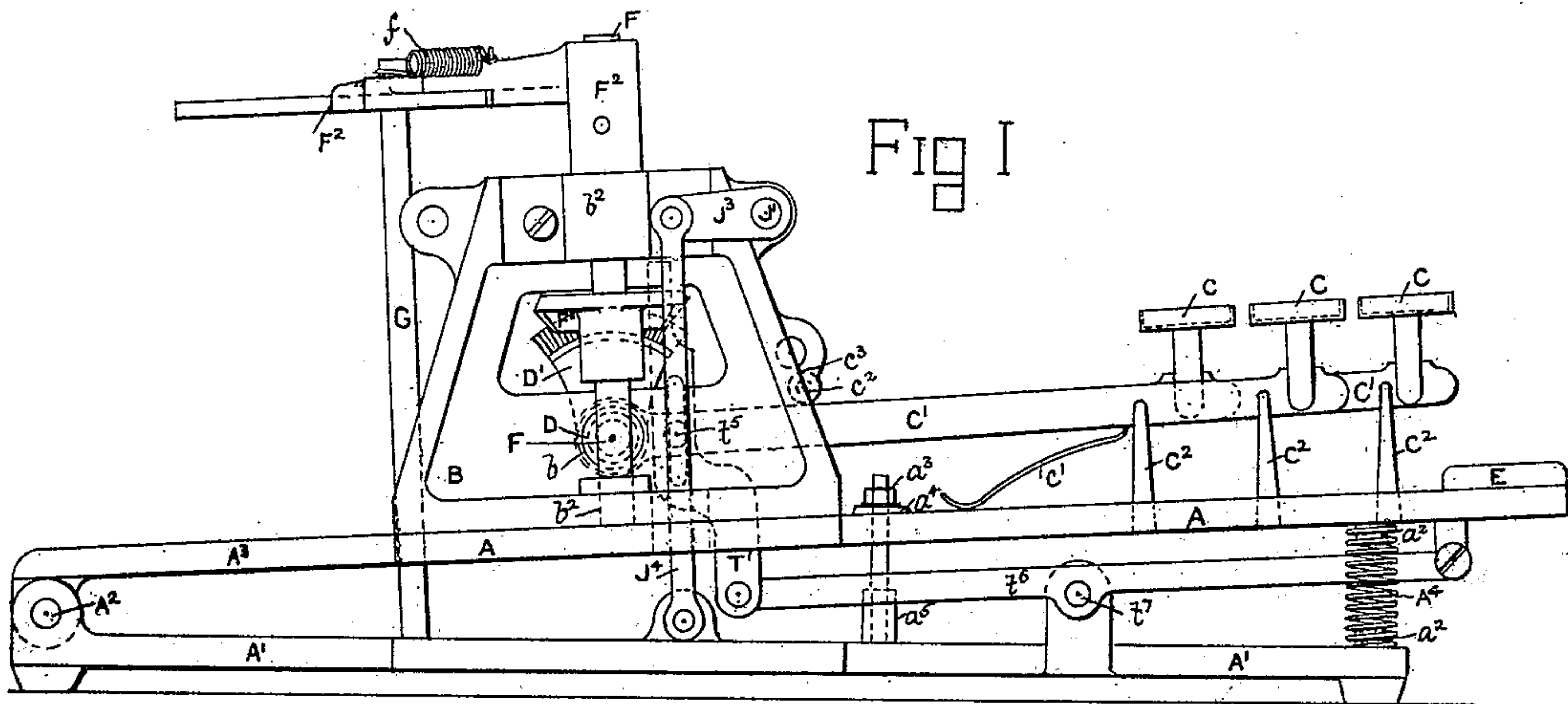
(No Model.)

4 Sheets—Sheet 1.

F. MYERS.
TYPE WRITING MACHINE.

No. 463,910.

Patented Nov. 24, 1891.



Witnesses
James F. Duhamel
Horace A. Dodge

Inventor
Frederick Myers,
by Dodge Sons,
Attys.

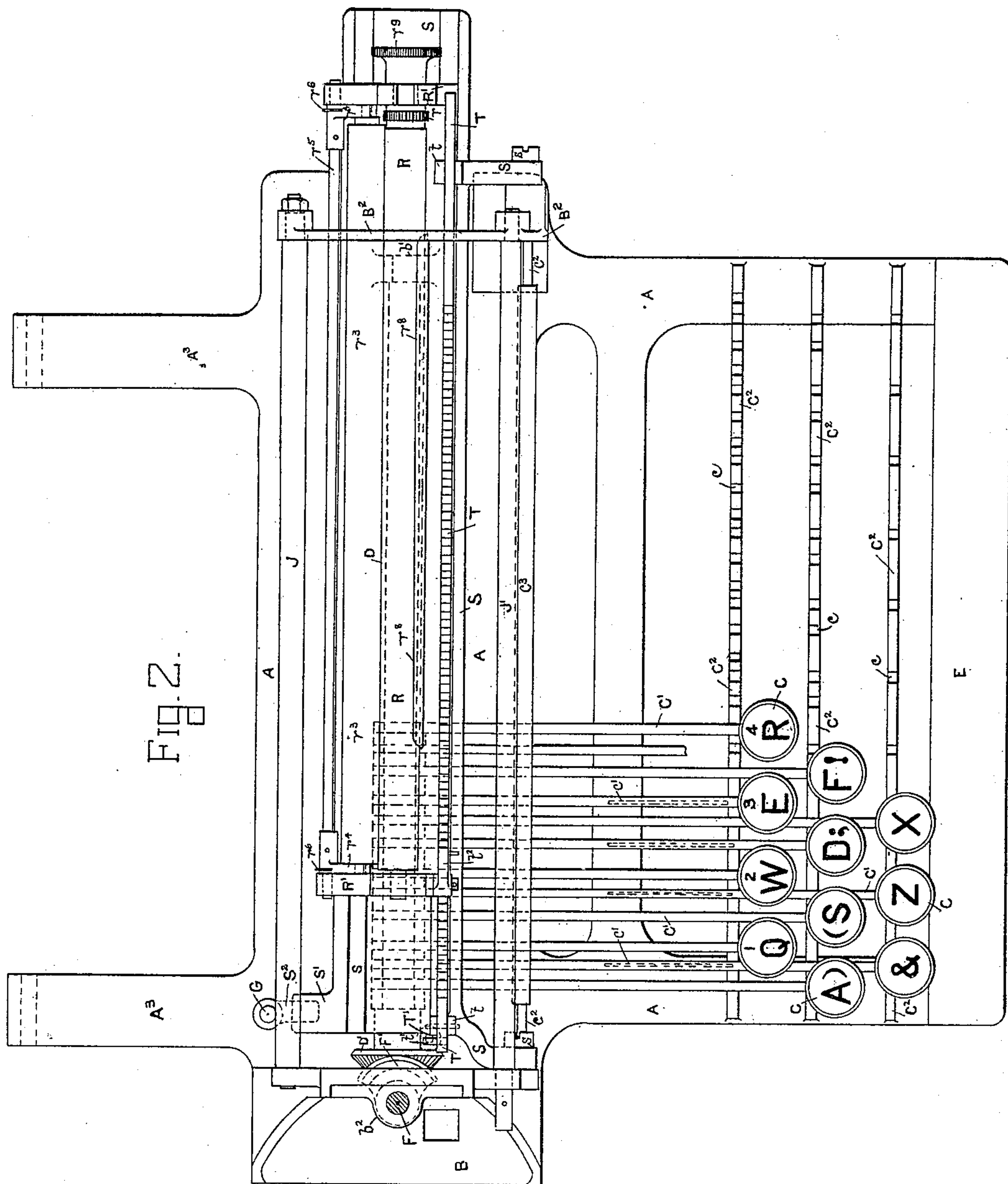
(No Model.)

4 Sheets—Sheet 2.

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4 Sheets—Sheet 3.

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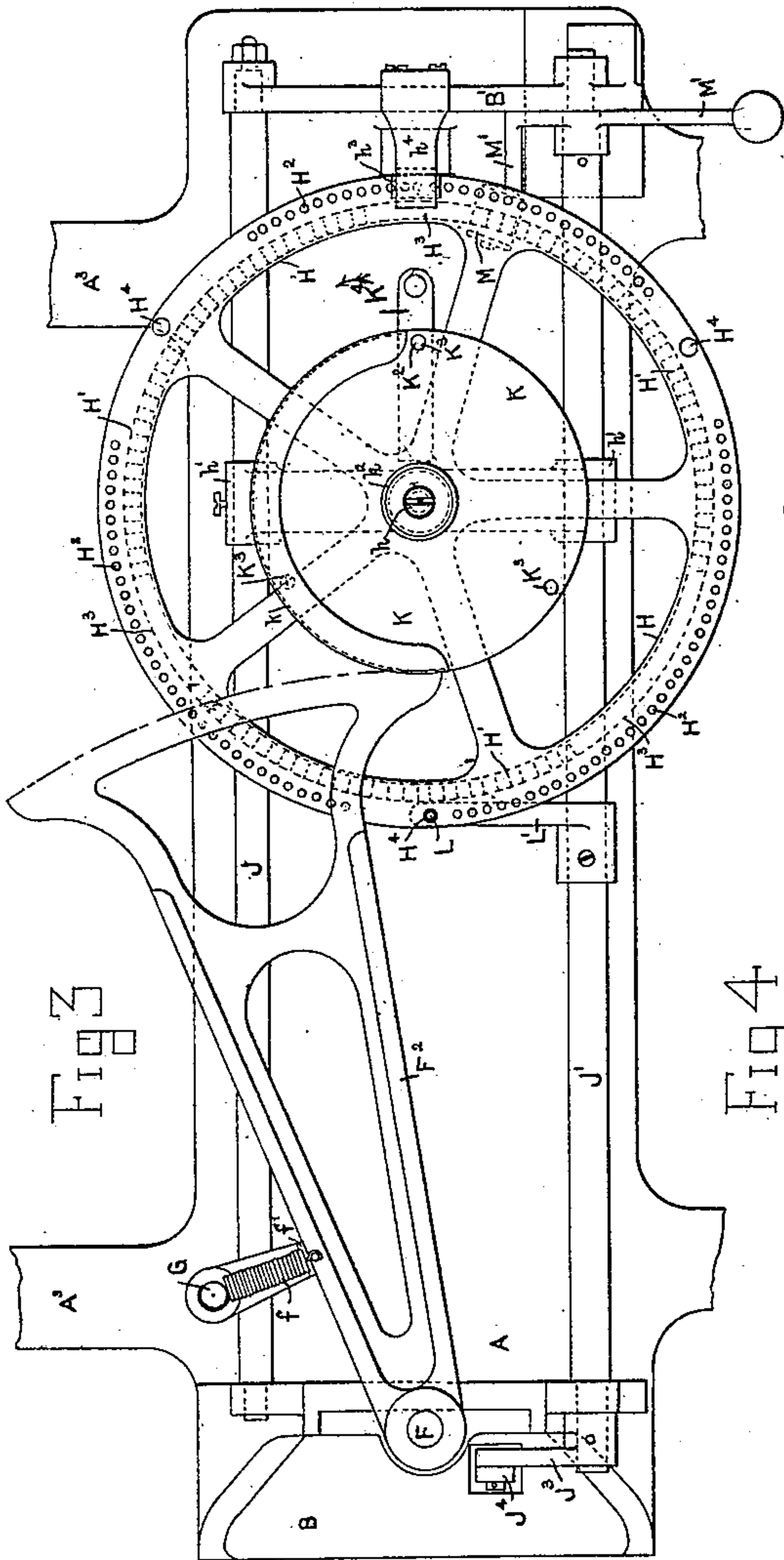
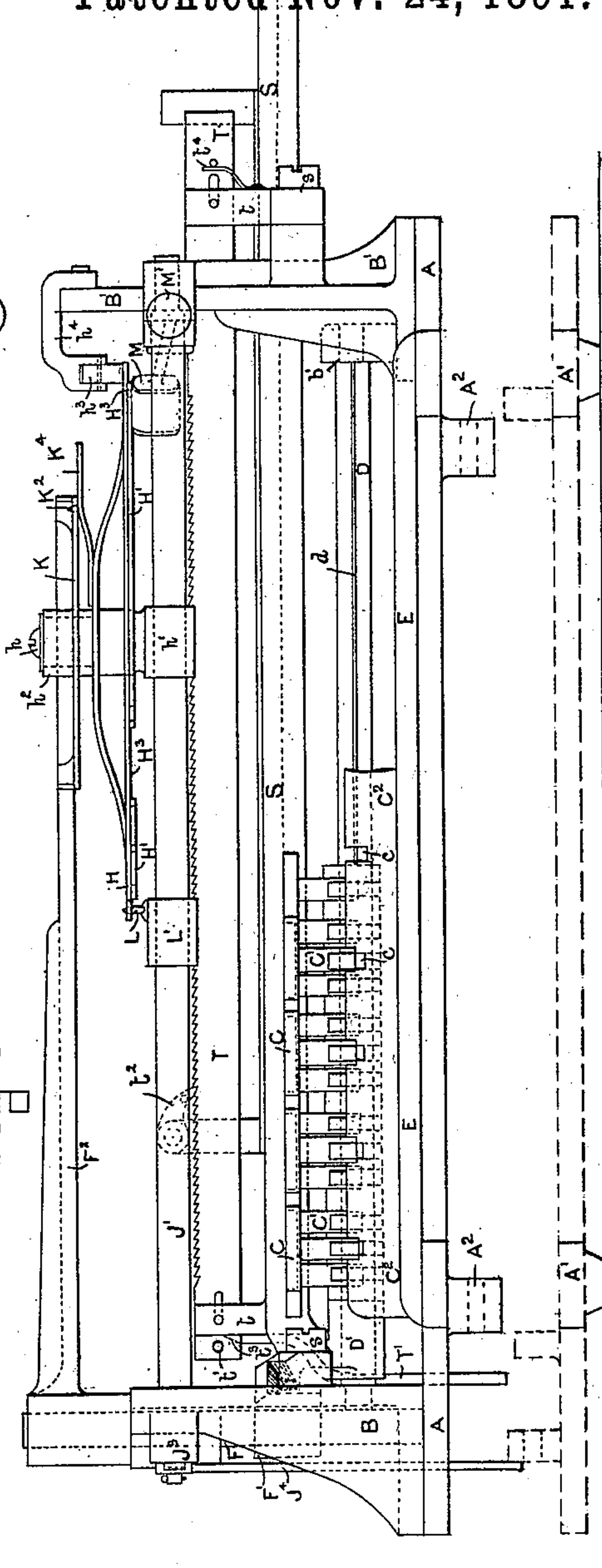


Fig 4



Witnesses

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(No Model.)

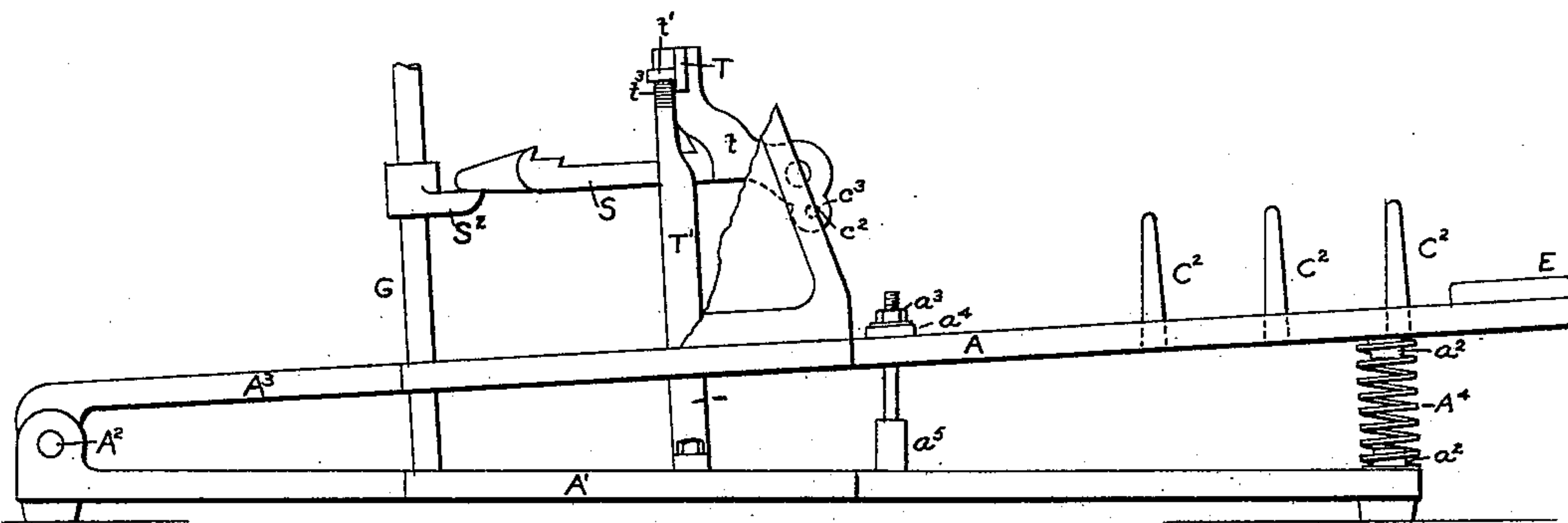
4 Sheets—Sheet 4.

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Fig-7



Witjesses

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UNITED STATES PATENT OFFICE.

FREDERICK MYERS, OF LIVERPOOL, ASSIGNOR TO THE MERCURY TYPE
WRITING MACHINE COMPANY, LIMITED, OF LONDON, ENGLAND.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 463,910, dated November 24, 1891.

Application filed March 26, 1889. Serial No. 304,816. (No model.) Patented in England June 4, 1888, No. 8,143; in Germany June 14, 1888, No. 47,462; in Austria-Hungary November 9, 1888, No. 25,161 and No. 46,388; in France December 3, 1888, No. 194,507, and in Belgium December 3, 1888, No. 84,154.

To all whom it may concern:

Be it known that I, FREDERICK MYERS, a citizen of the United States of America, residing at Liverpool, in the county of Lancaster, in the Kingdom of England, have invented certain new and useful Improvements in Type-Writing Machines, (for which I have obtained Letters Patent in France, No. 194,507, dated December 3, 1888; in Belgium, No. 84,154, dated December 3, 1888; in Germany, No. 47,462, dated June 14, 1888; in Austria-Hungary, No. 25,161 and No. 46,388, dated November 9, 1888, and in England, No. 8,143, dated June 4, 1888,) of which the following is a specification.

This invention relates to a type-writing machine in which the type are arranged above the printing roller or platen upon the under surface of a horizontal disk, the said disk being moved into a given position for each type thereon, the relative amounts of such movement depending upon the relative distances to which the key-levers are depressed.

The invention may be described by reference to the accompanying drawings, in which—

Figure 1 is an end elevation of the machine. Fig. 2 is a plan with some of the upper portions removed and parts broken away. Fig. 3 is a plan of the upper portion of the machine, the keys, key-levers, and parts of the framing being removed. Fig. 4 is a front elevation of the machine with parts removed. Fig. 5 is an elevation of the reverse end of the machine to that shown in Fig. 1, part being in section and parts removed. Fig. 6 shows a device for spacing the lines, and Fig. 7 a view illustrating a modification.

A is the main frame of the apparatus, on which is mounted the upright frame B, and the standard B' A' is the stationary machine-bed. The main frame A, carrying the frame B, standard B', and almost the whole of the mechanism, is pivoted to the fixed machine-bed A' at A², Fig. 1, the pivots passing through the arms A³, extending from the lower back edge of the main frame.

The main frame A is held normally in an elevated position, as shown, by means of a spring A⁴, Fig. 1, which is introduced between the said frame A and the fixed bed A'.

The spring is held in position by a core a^2 at each end thereof, or by having its ends inserted into holes in the frame and bed. The upward movement of the frame A is controlled by the adjustable stop a^3 , which is fitted with a buffer-block a^4 , a similar buffer a^5 being also provided for the frame to strike against at the termination of its downward movement.

The keys C are preferably arranged in three parallel rows at the front of the machine, as shown in Figs. 1 and 2. The same keys which are used for printing the large characters may also be used for printing the small characters and the figures in the manner herein-after described. Each key is attached to the front end of a key-lever C', all the levers being carried by a horizontal key-lever shaft D, which passes through their rear ends and is supported in bearings b and b' on the frame B and lug B², respectively. The key-levers are connected to the shaft D by a long key or feather d , Figs. 4 and 5, which passes through a suitable slot d' in the eye of each lever, so that the shaft is rotated for a certain distance whenever a key-lever is depressed. The key-levers corresponding to one row of keys are of a different length from those belonging to another row, so that a key in one row, when depressed to a given distance, would produce a different amount of movement in the shaft D from that which would be produced by a key in another row when depressed to the same distance. Each of the key-levers is guided at or near its outer end by a guiding-slot c , Fig. 4, against the lower end of which it strikes when depressed to a certain distance. The slots corresponding to each row of keys are preferably formed in a vertical guiding and striking rib C², extending across the main frame below the levers. No two slots in the same rib C² have the same depth, so that each key in a row is depressed to a different point, producing a different amount of rotation in the shaft D. The depth of the slots in each rib is so arranged (having regard to the varying lengths of the key-levers) that each of said levers, when depressed, will rotate the shaft D through a different angle from that of any other lever. The key-levers are, after

each depression, returned to their normal position by a spring c' , placed below each, and their upward movement is checked by a buffer arrangement, consisting, preferably, of a rod c^2 , covered with india-rubber c^3 , and passing from the frame B to the standard B' and bearing against the top edges of the levers. To avoid depressing all the key-levers each time a key is moved, the slots d' in the lever-eyes are made wider than the width of the feather d on the key-lever shaft, as shown in Fig. 5. The working edge of the feather is held normally by a spring f , Fig. 3, hereinafter described, against the corresponding edges of all the slots, so that the least downward movement of a key-lever will actuate the shaft. The greatest movement of which a key-lever is capable will not, however, cause the shaft to rotate so far as to bring the back or opposite edge of the feather d in contact with the corresponding sides of the slots of the other levers, and the latter will consequently remain stationary. After a lever is released the shaft is returned to its normal position by the spring f aforesaid.

A finger-bar E is arranged on the front of the main frame A, by which it may be depressed independently of the keys, for a purpose hereinafter to be explained.

The shaft D carries a toothed segmental wheel D', which gears with a similar wheel F' on an upright shaft F, carried in bearings b^2 on the upright frame B. The upper end of the shaft F carries a toothed segmental arm F², which projects over the machine for some distance. The said arm is connected with the spring f aforesaid, which returns it and the lever-shaft D to their normal positions whenever the latter are released. A buffer f' is also provided for the arm F² to strike against on its return movement.

The spring and buffer aforesaid may be attached to any convenient part of the machine; but preferably they are secured to an upright rod G, which passes through an opening in the main frame A and is secured to the fixed bed A', Fig. 5, the said rod being also employed for another purpose, as will be hereinafter explained.

The type are carried on the under side of a horizontal type wheel or disk H, Figs. 3 and 4, which is capable of being rotated upon a vertical pivot h , carried by a saddle h' . This saddle is mounted above the platen R, hereinafter described, in such a position that the right-hand edge of the type-wheel lies in proximity to the standard B', while its axis lies approximately in the same vertical plane as the axis of the platen. The saddle is supported in any suitable manner, preferably by horizontal rods J J', which pass through its ends, as shown, the rod J being firmly secured to the standard B' and frame B and rigidly fixed to the saddle, and the rod J' passing freely through the latter and being supported in suitable bearings on the frame B and standard B', within which it can oscillate, for a

reason hereinafter set forth. The type H' face downward and are arranged, preferably, in three groups, as shown, at a short distance from the periphery of the wheel and upon a circle concentric therewith. One group contains the capitals and the stops or signs most frequently used therewith. A second group embraces the small letters with their usual stops, &c., while the third group includes the numerals and those stops, signs, or characters which are seldom used.

A horizontal disk K is mounted loosely above the type-wheel upon the vertical pivot h or upon the elongated boss h^2 of the type-wheel. The whole or a portion of the periphery of the disk is provided with teeth k , into which the teeth on the segmental arm F² are geared, the disk being connected with the type-wheel, so that the latter may oscillate therewith by means of a spring-pin K² or its equivalent on the type-wheel, or, if preferred, on the disk. The disk K carries three nicks or holes K³ on or near its periphery, corresponding to the three groups of type on the type-wheel, into any of which the spring-pin may be inserted, according to the group of type with which it is desired to print. The spring-pin is provided with an extension K⁴, which serves as a handle for turning the type-wheel when adjusting it to a fresh group of type. With a spring-pin of this description the pin can be readily disengaged and the wheel turned at one operation by means of a finger or thumb.

Near the outer edge of the type-wheel there is placed a number of holes H², corresponding to and in the same relative angular position as the type, each hole being preferably diametrically opposite the particular type corresponding to it. This arrangement may be seen in Fig. 3. A locking-pin L is arranged to engage with one of these holes each time the main frame is depressed. This pin is placed below that side of the type-wheel which is remote from the side against which the printing-platen is pressed, and it is carried by a locking-arm L', attached to the oscillating rod J' aforesaid, the point of the pin being tapered, so that it may readily enter one of the holes H² to adjust and lock the type-wheel in the exact position for printing. The end of the oscillating rod J' projects through its bearing on the frame B and is provided with a horizontal arm J³, which is connected by a link J⁴ with the fixed bed A', Fig. 1, the said link passing through a hole in the main frame formed for the purpose. By this means the locking-pin L is raised and adjusts and locks the type-wheel at each depression of the main frame.

The type-wheel is made of light or flexible material, so that the side engaged by the locking-pin may be sprung slightly upward by the said pin, and thus the type on that side of the wheel immediately above the printing-platen are prevented from coming in contact with the latter.

An abutment or bearing roller h^3 , carried by a bracket h^4 , attached to the standard, rests against the upper surface of the type-wheel at the printing side thereof and directly above the platen. By this means the platen is prevented from bending the type-wheel when brought into contact with it in order to print, as hereinafter described.

The platen or roller R, Figs. 2 and 5, is supported in any convenient manner on the frame R' , which slides in a hinged guide or bed S. The end of the platen R is provided with a wheel r , having a number of notches r' , Fig. 6, into which a spring pin or pawl r^2 engages itself, holding the platen in any desired position. The distance between each of the notches r' is equal to the distance required between the lines of writing or printing. One side of the bed S is hinged or pivoted at s to the upright frame B and to the standard B' or in other convenient manner. The other side is supported upon the adjustable arm S^2 by means of the tail S' of the hinged bed. The adjustable arm S^2 is preferably carried by the upright rod G aforesaid. The depressing of the main frame A causes the type-wheel H and the platen R to be brought into contact with each other.

Referring to Figs. 2, 4, and 5, the depressing of the pivoted main frame A also causes the platen-frame R' to be moved longitudinally the necessary distance for spacing the letters. This may be effected as follows: A toothed rack T is supported in brackets t , attached to the hinged bed S, and has at its end a pin t' . The sliding frame R' has pivoted to it a pawl t^2 , which engages the teeth of the toothed rack T in one direction only. A spacing-finger T' , having an inclined or wedge-shaped termination t^3 , is mounted upon the inner side of the frame B, so as to slide thereon in an approximately vertical direction, being guided by a pin t^5 working in a slot in the finger. The inclined end projects upward, with its point in close proximity to one side of the pin t' , as in Figs. 2 and 4. The lower end of the finger is jointed to one end of a lever t^6 , which oscillates at or about its center on the pivot t^7 , carried by the fixed bed A' , the other end of the lever being pivoted to the main frame A at or near its front edge. As the frame A is depressed, the inclined end of the spacing-finger is forced upward against the side of the pin t' aforesaid and causes the rack T, and consequently the platen-frame R' , to be drawn along the distance necessary to space a character or word. The rack having been drawn along the required distance, the pin t' rests during any further movement of the main frame A against the vertical side of the spacing-finger T' without operating the rack T. On the upward movement of the main frame the rack is returned to its original position by a spring t^4 . When the sliding frame R' is to be withdrawn, the pawl t^2 may be thrown back out of gear, or the spacing-finger T' may be se-

cured in a stationary manner to the fixed bed A' , with its inclined end t^3 projecting upward in close proximity to the side of the rack-pin t , so as to engage the latter when the main frame is depressed, as shown in Fig. 7.

In order to space the words, the frame A may be depressed by the finger-bar E instead of by a key. A gap H^3 is left between each two groups of type on the type-wheel, in order that the type may not come in contact with the platen when spacing a word. A hole H^4 , larger than the locking-pin L, is also formed between each two groups of holes H^2 , so that the said pin, when raised in spacing a word, may not come in contact with the type-wheel.

The sheets of paper Q is held in position on the platen R by means of a roller r^3 , Figs. 2 and 5, which lies against the platen R. The roller r^3 is mounted between two arms r^4 , which are pivoted at r^5 to the sliding frame R' . The roller r^3 is held in contact with the printing-platen by a spring or springs r^6 , which press against the arms r^4 . One of these arms has an extension r^7 , by means of which the roller r^3 may be drawn away from the platen R when the paper is to be inserted or adjusted. To fix a sheet of paper in the machine, the edge of the sheet is first slipped under the platen R, being guided by the guide r^8 . The roller r^3 is then thrown back, and the edge of the paper turned over the platen and held in position thereon by releasing the roller r^3 .

The type may be inked previously to each impression as follows: The ink is placed upon a roller M, Figs. 3 and 4, of absorptive material. This roller bears against the type and is carried by a pivoted spring or counter-weighted lever M' , which is pivoted at a convenient point of the frame-work, preferably upon the oscillating rod J' , so as to bear with a constant pressure on the type. The type required to print is drawn across the ink-roller each time the type-wheel is oscillated previous to and after printing.

A warning-bell such as is usually found in type-writing machines may be placed in any convenient position, so as to ring when a line is almost complete.

The mode of action is as follows: The type-wheel H is first adjusted by means of the extension K^4 , so that its spring-pin K^2 enters the hole K^3 in the disk K corresponding to the group of type with which it is desired to print. A key is depressed and causes a partial rotation of the type-wheel by means of the type-key lever C' , belonging to the said key, and by means of the lever-shaft D, the gearing D' F' , the segmental arm F^2 , and the actuating-disk K. The key-lever strikes the bottom of its guiding-slot c as soon as the type-wheel has been moved sufficiently to bring the corresponding type into position for printing. By continuing the pressure on the key the pivoted main frame A is depressed. This causes the oscillating rod J' to travel bodily in a downward direction and to be oscillated by means of its terminal arm J^3 and the link J^4 , connect-

ing the latter with the fixed bed. The oscillation of the rod J' raises the free end of the locking-arm L' and causes the locking-pin L to enter the hole in the side of the type-wheel just above it and to spring the said side slightly upward, as before described. During the first part of the downward movement of the main frame the rack-pin t' slides against the inclined spacing-finger T' , and the platen is consequently drawn along into the proper position for printing. Owing to the rate of downward travel of the type-wheel being greater than that of the platen, the two approach each other during the depression of the main frame, and by the time the latter has descended to the buffer a^5 the platen has pressed the paper Q against the type-wheel and produced an impression. The key being released, the key-lever, type-wheel, and main frame are returned to their normal position by their respective springs c' f A^4 . The spacing-finger T' is withdrawn from the rack-pin t' , and the rack returns to its original position by its spring t^4 . The machine is now ready for another or the same key to be depressed to produce the next impression. On the completion of a line the pawl t^2 is thrown back, the platen-frame is withdrawn, the hand wheel or disk r^3 , Fig. 2, is turned in the direction of the arrow, Fig. 6, so that the pawl r^2 is depressed, and the platen can now be turned so as to move the paper the distance required to print the next line.

In describing the foregoing machine it has been assumed that the matter was printed from left to right. The machine could, however, with slight modifications be adapted to print from right to left; also, the style of the printed characters may be varied by having a series of similar type-wheels each bearing characters of a particular style, any one of which wheels may be readily changed for any other.

It will be obvious that the exact details of the apparatus herein described may be modified to a certain extent without exceeding the scope of the invention.

I lay no claim herein to the following device: the combination of the pivoted main frame, the type-wheel thereon, the platen below said wheel, the sliding platen-frame, and the platen-frame bed hinged at one side to the main frame and supported at its opposite side upon a stationary abutment, as a substantially similar device is fully described and claimed in my pending application, Serial No. 296,720, filed January 18, 1889; nor do I claim the line-spacing mechanism nor the paper holding and guiding devices. Both constructions are publicly known, and the former is fully described in my pending applications, Serial Nos. 263,189 and 296,720, while the latter is set forth in my pending application, Serial No. 296,720.

I claim as my invention—

1. In a type-writer, the combination of a type-disk adapted to be turned upon its axis

from a normal position and having the type arranged on its face upon a circle concentric with its axis, a series of parallel key-levers mounted upon a lever-shaft and capable of turning the same from a normal position through different angles corresponding to the various relative angular positions of the type on the disk which they respectively represent, and suitably-proportioned gearing connecting said shaft and type-disk, whereby each key-lever is enabled to turn the type-disk from its normal position through a different and definite angle and to place the type represented by such lever in position for printing, substantially as described.

2. In a type-writer, the combination, with a shaft D , connected by suitable gearing with an oscillatory type-disk H , of a series of parallel key-levers mounted upon said shaft and each capable of turning the same for a limited distance, a stop device adapted to limit the movements of said levers in one direction, and a series of stops of varying heights adapted to limit the movements of said levers in the opposite direction, whereby the travel of each lever is so adjusted that its movement in one direction is enabled to impart just sufficient movement to the type-disk as will place the corresponding type in position for printing, substantially as set forth.

3. In a type-writer, the combination, with the type-disk H and with the shaft D , connected therewith, of the key-levers C' , mounted on said shaft and each capable of imparting a different amount of rotary movement thereto, the stop device c^2 c^3 , placed above the upper edges of said levers, means adapted to hold the levers normally in contact with said stop device, and one or more upright ribs C^2 , provided with guiding-slots c , having their lower closed ends located at various distances from the lower opposing edges of said levers, substantially as set forth.

4. In a type-writer, a series of parallel key-levers C' , each provided with an independent elevating device and with a stop device for limiting its upward movement, and a key-lever shaft D , connected with a rotatable type-wheel and passing through the rear ends of said levers, in combination with a long feather in the shaft held normally in a given angular position, and a widened slot in each lever-eye resting normally with its working edge in contact with the corresponding edge of the feather and having its back edge located at a suitable distance from the corresponding edge of the feather, whereby each individual lever may be depressed without moving the others, substantially as set forth.

5. In a type-writer, the combination, with a type-wheel H and key-lever shaft D , of a toothed wheel D' on the said shaft, a wheel F' , gearing with the same and rigidly mounted upon a rotatable shaft F , a toothed quadrant F^2 , fixed on said shaft F , and a toothed driving-wheel K , gearing with said quadrant and movable synchronously with the type-wheel,

whereby the varying movements of the lever-shaft D are transmitted to the type-wheel, substantially as described.

6. In a type-writer, a normally-elevated main frame A, pivoted at or near one of its sides upon a fixed bed, a type-wheel mounted upon said frame, and a platen R, located below said type-wheel, in combination with a series of pivoted and depressible key-levers C', carried by the frame and adapted to adjust the type-wheel into the printing position, and a corresponding series of striking-points of various heights, as described, located below the levers at the side of the frame remote from its pivot axis, whereby the said frame may be depressed to print after the adjustment of the type-wheel by the continued pressure upon the key-levers, substantially as described.

7. The combination of the main frame A, the standards B B' thereon, the fixed rod J, connecting the standards, the parallel oscillatory rod J', journaled upon the same, the locking-arm L', fixed to the rod J', and the saddle h', mounted upon the rods J J' and carrying the type-disk pivot h, substantially as described and shown.

8. In a type-writer, the combination, with a depressible main frame A and a platen R, of a flexible type-disk mounted with its axis approximately at right angles to and intersecting that of the platen, and a locking-pin L, adapted on the depression of the main frame to engage the type-bearing face of the disk on the side remote from the printing-point, whereby the type diametrically opposite to the printing-point are prevented from coming in contact with the platen during the act of printing, substantially as set forth.

9. In a type-writer, the combination, with a type-disk H, having the type upon its face, of a bearing roller or abutment h³, located opposite the printing-point of the platen in con-

tact with the rear face of the disk and adapted to receive the thrust of the platen during the operation of printing, substantially as described.

10. In a type-writer, the combination, with a depressible main frame A and a reciprocatory spacing-rack T, connected, as described, with the sliding platen-frame, of a rack-pin t', projecting laterally from said rack, a spacing-finger T', capable of sliding upon the main frame in an approximately vertical path and located normally with its upper inclined termination in proximity to one side of the said rack-pin, and a rocking lever t⁶, pivoted upon the fixed machine-bed and connected at one end to said spacing-finger and at the opposite end to the front portion of the main frame, whereby the rack and platen are drawn along the necessary distance to space a character or word each time the main frame is depressed, substantially as described.

11. In a type-writer, the combination, with a key-lever shaft D, having a series of key-levers adapted to impart various amounts of movement to the shaft, and an oscillatory type-wheel H, mounted upon an approximately horizontal axis above the said shaft, of a toothed wheel D' on the shaft D, a wheel F', gearing with the same and carried by a transverse shaft F, an upright quadrant F², fixed on the shaft F, and a pinion K on the type-wheel shaft gearing with said quadrant F², whereby the varying movements of the lever-shaft D are transmitted to the type-wheel, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

F. MYERS.

Witnesses:

GEO. C. DYMOND,
H. P. SHOBRIDGE.