

J. A. RUFFIN.
TYPE WRITING MACHINE.
APPLICATION FILED APR. 2, 1907.

915,890.

Patented Mar. 23, 1909.

4 SHEETS—SHEET 1.

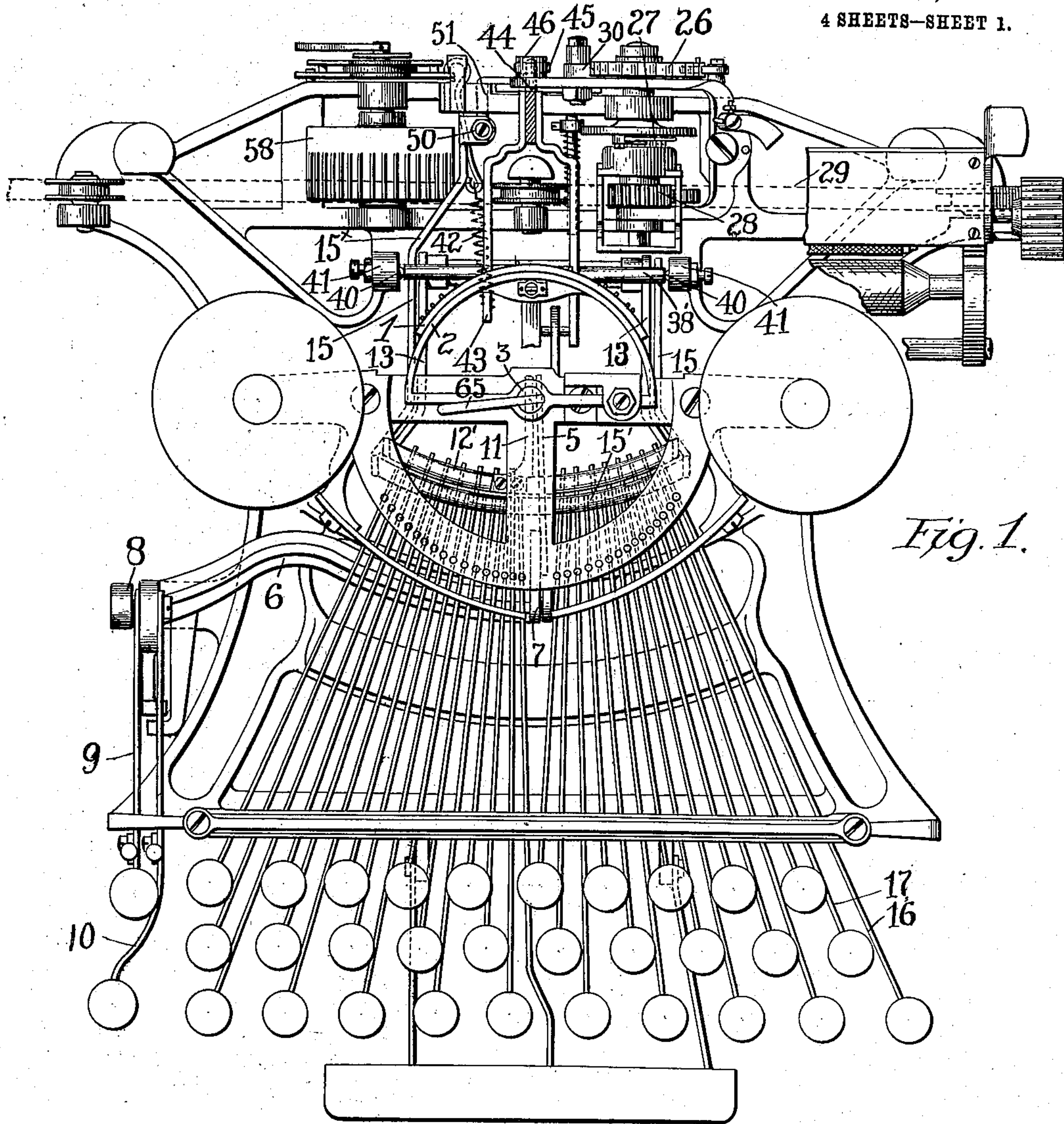
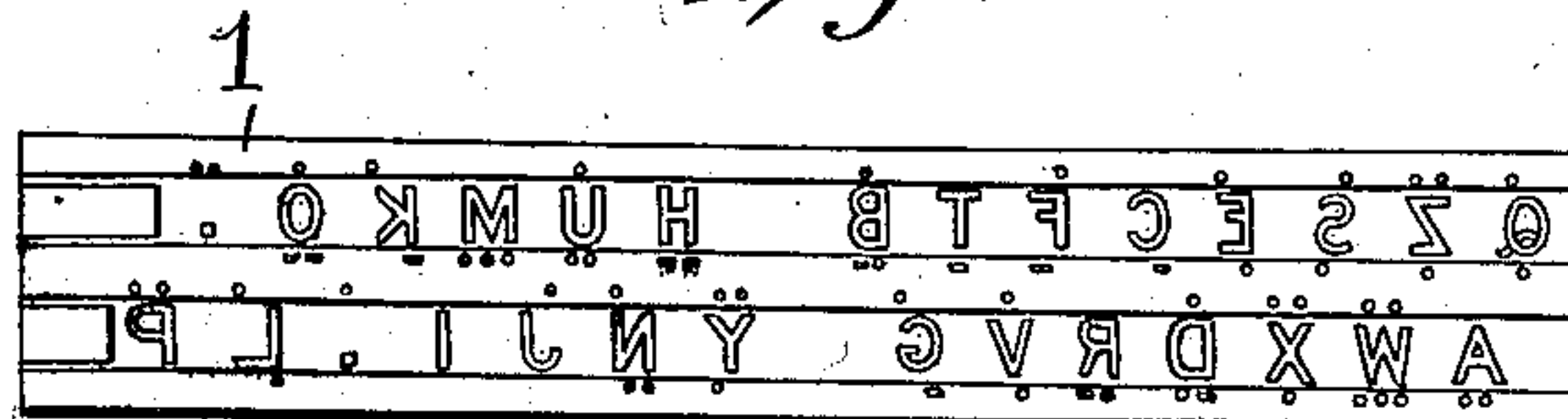


Fig. 1.

Fig. 9.



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Edward N. Sartou
B. G. - Phillips.

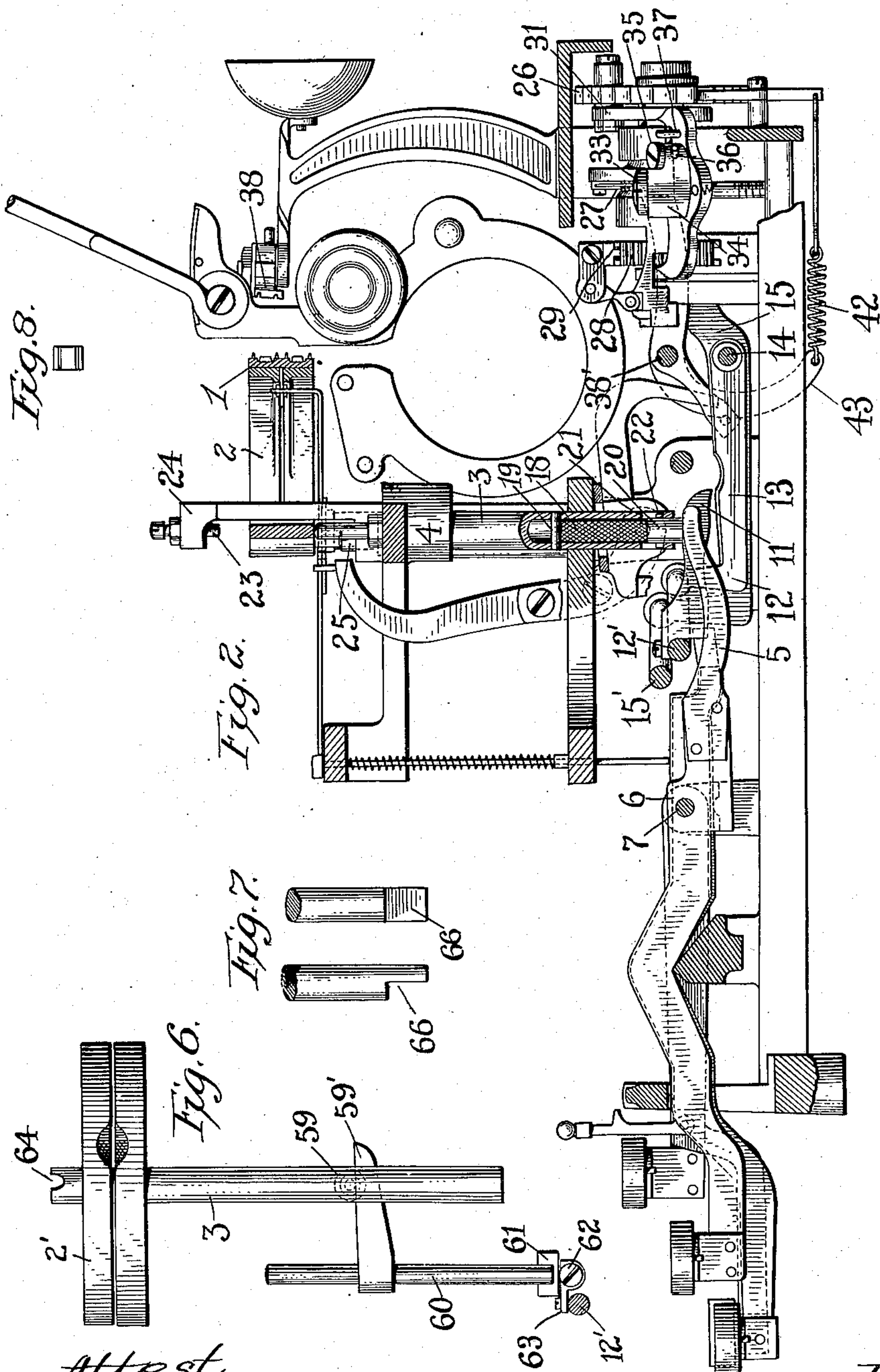
Inventor.
John A. Ruffin
by Spear Middleton, Donaldson & Spear
Attys.

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Attest
Edward N. Sarton
B. G. Phillips.

Inventor
John A. Ruffin
by Spear, Middleton, & Morrison
Attys.

915,890.

4 SHEETS--SHEET 3.

Attest
Edward N. Sutton
B. G. Phillips.

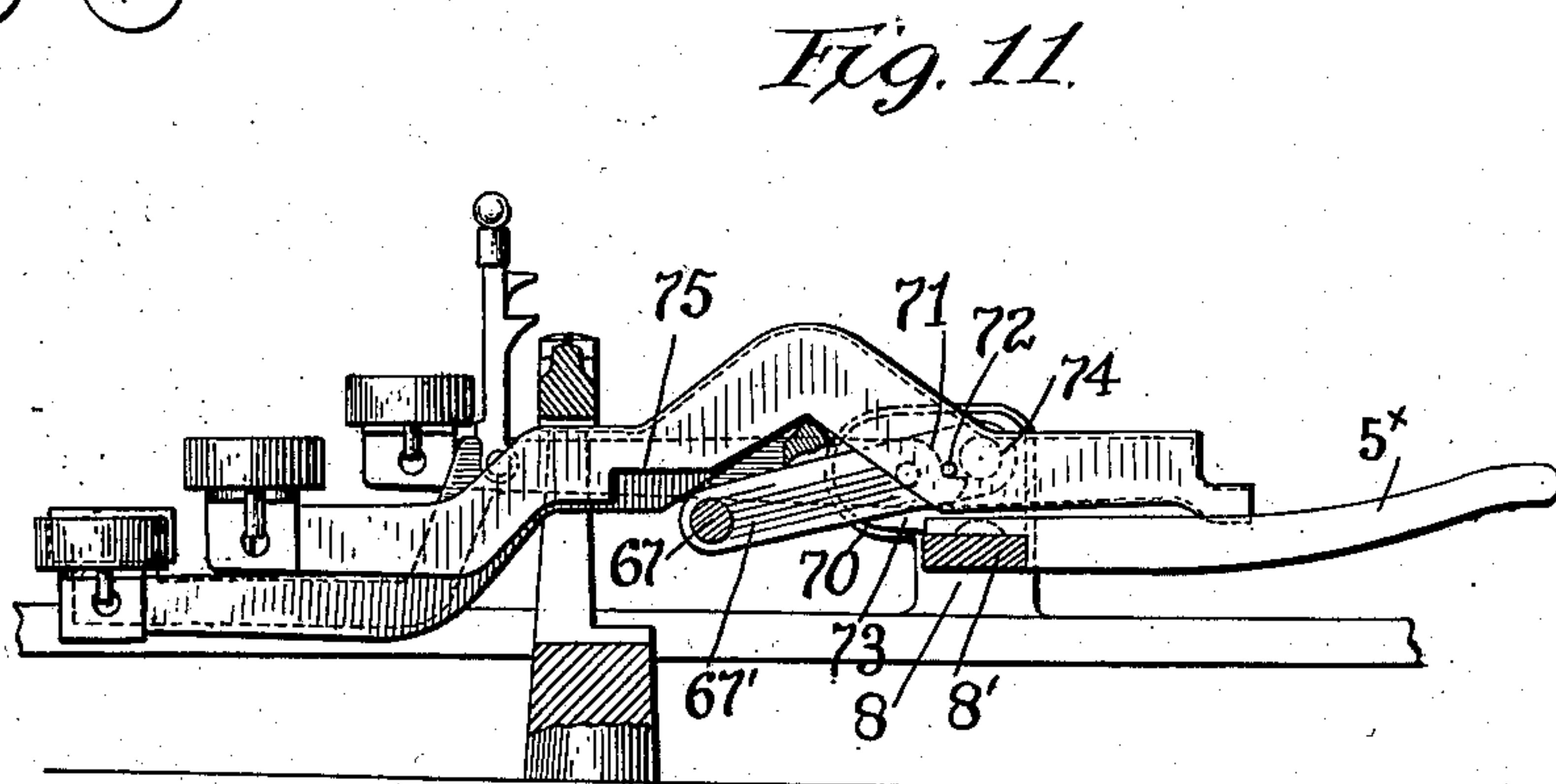
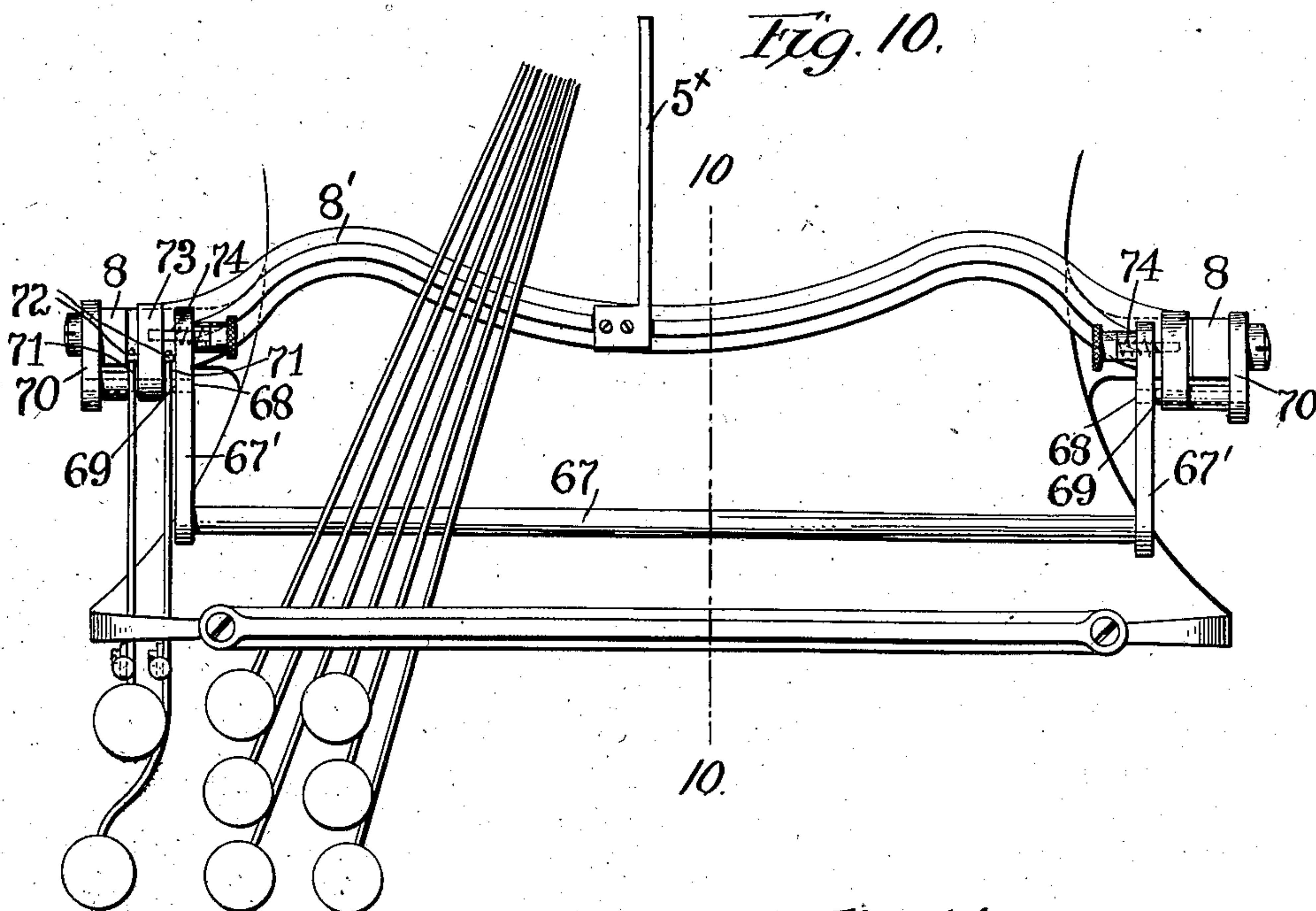
Inventor
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by Spear, Middleton, Donarson & Spear
Attys.

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4 SHEETS—SHEET 4.



Attest:

C. S. Mason
Edward N. Lorton
B. G. Phillips

Inventor
John A. Ruffin
by Spear, Middleton, Donahoe & Spear.
Attys.

UNITED STATES PATENT OFFICE.

JOHN A. RUFFIN, OF NEW YORK, N. Y., ASSIGNOR TO THE HAMMOND TYPEWRITER CO., OF
NEW YORK, N. Y.

TYPE-WRITING MACHINE.

No. 915,890.

Specification of Letters Patent.

Patented March 23, 1909.

Application filed April 2, 1907. Serial No. 365,970.

To all whom it may concern:

Be it known that I, JOHN A. RUFFIN, a citizen of the United States, residing at New York city, New York, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

My invention is designed to produce raised impressions upon sheets of paper or other material for use in connection with automatic telegraph transmission instruments, wherein the form or paper sheet having the embossed or raised impressions thereon is introduced into the machine so that a stylus acting on the raised portion will control the transmission of the electrical impulses.

In carrying out my invention I employ a typewriter of the well known Hammond type modified in certain particulars herein after fully explained in such manner as to meet the requirements.

In the accompanying drawings,—Figure 1 is a plan view of a Hammond typewriter, some of the parts being omitted for clearness of illustration. Fig. 2 is a sectional view from front to rear through the key lever mechanism and shuttle substantially on a central line with the escapement and hammer mechanism at the rear of the machine shown in side elevation. Fig. 3 is a rear view of the machine employed for carrying out my invention. Fig. 4 is a detail view of the escapement mechanism like that shown in Fig. 3, but with the parts in a different position and adjusted to secure a double letter spacing action of the carriage. Fig. 5 is a detail view of the escapement lever and the means thereon for controlling the action of the escapement pawl. Fig. 6 is a detail view of an anvil with means for controlling it for carrying out the purpose of this invention, the said anvil being capable of adjustment to convert the machine into a condition for ordinary use. Fig. 7 is a detail view of an anvil post, which upon its introduction into the machine will render it in a condition for ordinary writing. Fig. 8 is a detail view of the face of the printing hammer. Fig. 9 is an enlarged face view of the shuttle for carrying out my invention. Fig. 10 is a detail plan view of an arrangement by which the machine may be adjusted for ordinary writing or for writing the telegraphic code in carrying out the main purpose of this invention. Fig. 11 is a detail

sectional view substantially on the line 10—10 of Fig. 10 and looking toward the left.

In carrying out my invention I employ a shuttle, such as shown in Fig. 9 having the letters of the alphabet arranged in two horizontal rows, one above the other, and each letter having associated therewith raised points or raised dashes constituting the code sign of the said letter. Impressions are made from the letter type and the code points simultaneously, so that any unskilled person can read the message from the ordinary impressions. In some instances, this code sign is arranged only at the bottom of the letter, for example, the letter M has a code sign consisting of three dots and consequently the shuttle has three projecting points adjacent the letter M directly beneath the same. The letter U has a point above and two points below. The letter O has a code sign consisting of a point above and two dashes below, and these code signs being made up of dashes or dots, or the combination of dashes and dots, are of considerable lateral extent and in order to keep the shuttle within a practical limit of length, I have, as above stated, arranged the characters forming the alphabet or code in two horizontal lines, and I have provided means whereby the shuttle is automatically controlled by the keys so as to bring either row of characters to the printing point, and I have provided means also whereby the ordinary Hammond typewriter may be adjusted to give the necessary letter spacing movement to accommodate the extra width of these code characters.

The shuttle, 1, as in the ordinary Hammond machine is used with an anvil 2, which latter is carried by a post 3 held in the frame 4 of the machine. This post at its lower end lies directly above an arm 5 connected to a rocking frame 6 journaled at 7 and 8 to parts of the main frame, the said rocking frame or arm being controlled in the ordinary manner by the fig. key 9 and the cap. key 10 so as to raise the shuttle to bring different lines of characters into the printing planes. In my present improvement in addition to this ordinary means for lifting the shuttle, I employ an arm 11 connected with a frame 12, and which has arms 13 extending rearwardly and journaled upon the rod 14, which in the ordinary Hammond machine constitutes the axis of the ordinary trip frame 15. The shuttle

lifting frame 12 is of substantially the same shape as the said trip lever and it is provided with a curved front rod or portion 12' overlying the rear ends of certain of the key levers, and the trip frame 15 is likewise provided with a curved rod or portion 15' which overlies the rear ends of all of the said key levers.

As will be noticed from Fig. 1, beginning with the second key lever at the left each alternate key lever extends beyond the trip frame bar 15' and beneath the bar 12' of the shuttle lifting frame. A substantially similar arrangement of the key levers obtains at the right side of the machine, namely, beginning at the extreme right the key lever extends beneath both the trip frame and the lifting frame and this is true of alternate keys, whereas the other key levers extend only beneath the trip frame. From this construction it will be seen that when the long levers 16 are operated the first effect will be to lift the anvil post, which through the anvil will lift the shuttle to bring the lower row of characters thereon to the printing plane, and in the final movement of the key levers the trip frame will be operated to release the hammer and the carriage escapement mechanism. This will produce printing from the lower row of characters. When the short levers 17 are operated the shuttle lifting frame is not disturbed, and consequently the shuttle remains in its low, or what may be called its normal position and the printing is done by the upper row of characters. It will therefore be understood that the keys are operated in the ordinary manner, and that the printing is done from the rows of characters on the shuttle, the said shuttle either rising or remaining in its lower position according to the keys depressed and without requiring any special attention on the part of the operator.

I prefer to cushion the lifting action of the long key levers, and for this purpose I provide a cushion of rubber or other suitable elastic material or means such as shown at 18 located within the hollow stem or post of the shuttle, said cushion being retained by a pin 19 and being borne upon at its lower end by a stud 20 arranged within the lower end of the said post, the said pin or stud projecting slightly from the lower end of the post and resting upon the arms 5 and 11, which act to lift the shuttle. The anvil post is slotted at 21 and pins 22 on the stud 20 work in these slots, serving to hold the stud in place. This cushion becomes effective when the anvil in its upward movement is arrested by an adjustable stop 23 held in a bracket 24 secured at 25 to the central frame of the machine.

As above indicated, the code characters are of greater lateral extent than the ordinary characters on the Hammond shuttle and I therefore provide means for securing a dou-

ble spacing action of the carriage, said means being adjustable so that the one machine may be used for writing the telegraphic code, or by a simple adjustment it may be used for ordinary writing, as in the well known Hammond machine. This adjustable escapement mechanism I will now describe.

The escapement wheel is shown at 26, this being of the usual form and connected through the pawl and ratchet device 27 with the rack pinion 28, which pinion meshes with the carriage rack 29. With this escapement wheel the escapement pawl 30 engages, said pawl being carried by a hammer lever 31 pivoted on the axis of the escapement wheel and having a tail portion 32 arranged to coact with a stop 33 consisting of a headed screw or pin fixed to the frame. I associate with the hammer lever a variable spacing stop consisting of a piece or block 34 pivoted at 35 to the tail portion of the hammer lever, whereby the said variable spacing stop may be set in position shown in Fig. 1 to be free from contact with the head of the stop 33 when the tail piece of the hammer lever rises, or it may be set in the position shown in Figs. 2 and 3 so as to strike the stop 33, thus limiting the movement of the hammer lever. The variable stop is limited in its movement by the pins 36 thereon striking against the pin 37 projecting from the tail piece of the hammer lever. When the variable stop is set in the position shown in Fig. 3, the escapement mechanism is set for the ordinary letter spacing movement of the carriage, but when the said variable stop is adjusted into the position shown in Figs. 1 and 4, the letter space movement of the carriage will be twice that for which the parts are set in Fig. 3. It will be understood that the hammer lever as usual is connected with the hammer 38, the frame of which is carried by a shaft 38' pivoted at 40 in standards 41 extending up from the main frame, the said hammer being under tension of a spring 42 connected to the extension 43 of the hammer frame. The connection between the hammer and the hammer lever is made by the projection 44, from the hammer connecting with a pin 45 carried by the hammer lever and adapted to have slight sliding movement in the boss 46 of said lever. The escapement pawl 30 is controlled from an arm 47 carried by the escapement lever 48, which as ordinarily, is pivoted to the frame at 49 and is operated from the trip frame 15 by means of the extension 15' of said trip frame which carries an adjustable screw 50 overlying the forwardly bent end 51 of the said escapement lever. This escapement lever has the ordinary detent tooth 52. The arm 47 is different from that heretofore used in the Hammond typewriter, and the same is true of the pawl 30, this difference including the use of a spring 53 for pressing the pawl constantly toward the ratchet

wheel and the use of the arm 47 instead of the forked arm heretofore used in this style of typewriter. The arm 47 is adapted to bear upon a pin 54 of the pawl upon one side only thereof and it is of cam shape so as to exert proper control of the pawl, whether the escapement mechanism be adjusted for single or double letter spacing. The arm 47, it will be noticed is cam shaped and this cam is made up of an adjustable portion 55 held by a screw 56 passing through a slot 57 in the adjustable piece and into the main portion of the arm 47 which is rigidly connected to or formed with the escapement lever. The purpose of this cam construction is to secure precisely the same degree or extent of contact between the tooth of the escapement pawl and the teeth of the escapement wheel in both adjustments of the escapement mechanism, that is, for the single letter spacing action as well as for the double letter spacing action. This contact between the pawl tooth and the escapement wheel tooth can be regulated to a nicety and made exactly uniform for both adjustments by adjusting the cam piece 55 so that the pin 54 bearing on the exposed edge of the said cam piece will hold the pawl in exactly the same relation to the tooth for double letter spacing as does the edge of the main portion 47 of the cam arm hold the pawl in relation to the escapement wheel tooth for single letter spacing action. It will of course be understood that the carriage is under tension of the spring in the spring drum 58 as is common in this style of machine, and the tension of this spring is transmitted from the rack pinion to the escapement wheel. When a key is depressed, the escapement lever 48 is operated, which through the arm 47 thereon will throw the pawl 30 out of engagement with the tooth of the escapement wheel and the hammer lever being thus released allows the hammer to fly forward under the action of its spring 42 to make the impression, the escapement lever 48 meanwhile holding the escapement wheel against movement by reason of its detent 52 engaging the tooth of the escapement wheel. Upon the release of the key lever the escapement lever 48 releases the escapement wheel and this now turns under the tension of the carriage spring and the extent of rotary movement of the said escapement wheel, and consequently the extent of movement of the carriage will be regulated according to the position of the variable stop 34 in relation to the fixed stop 33. If said variable stop is adjusted so as to strike the stop 33 the movement of the escapement wheel will be only the ordinary letter space movement, as at this time the pawl is in engagement with the tooth of the escapement wheel and consequently the escapement wheel will be arrested as soon as the stop 34 strikes the fixed stop 33. If, however, the variable stop 34 is thrown aside

as in Fig. 1, the movement of the escapement wheel will continue until the tail piece of the hammer lever strikes the stop 33, which will give the carriage a double letter spacing action.

The importance of the cam shaped controlling arm with its adjustable feature for controlling the engagement of the pawl with the tooth of the escapement wheel will be appreciated when it is considered that it is necessary to have the pawl engage the teeth to the same degree or extent at each action, or otherwise the touch of the keys will be different for the different letter spacing actions.

From the above it will be seen that I have provided a machine having a variable escapement action so that the machine may be used for ordinary writing at which time the ordinary letter spacing is effected, or the machine may be set for double spacing to print characters of extra width, such as in the telegraphic code indicated on the shuttle, Fig. 9.

In order to make the machine convertible, not only as to its escapement mechanism, but also as to its printing mechanism, I provide certain adjustments whereby the machine may be used with an ordinary shuttle or with the special shuttle shown in Fig. 9 for printing the telegraphic code. One means of carrying out this convertible feature is represented in Fig. 6, in which the anvil 2' is carried by a post having upon one side only thereof a pin or roller 59 engaged by an arm 59' on a rod 60 guided in any suitable part of the frame and having at its lower end a transverse piece 61 to be engaged by a roller 62 on an arm 63 secured to the lifting frame 12 before described. When this anvil is in the relation shown in Fig. 6, the machine is adapted to print with the special shuttle shown in Fig. 9, the said shuttle being lifted when the keys corresponding to the lower row of characters are depressed, said lifting being effected through the frame 12, the vertical rod 60, the arm 59' and the pin or roller 59. When, however, it is desired to use the machine for ordinary writing, the special shuttle is removed from the anvil and an ordinary shuttle is placed therein, and then the anvil is turned from the position shown in Fig. 6 one half way around so that the roller or pin 59 will not be in the path of the arm 59' when this rises as a result of the operation of the lifting frame 12 by the key levers. The anvil post is provided with a notch at its upper end at 64 adapted to receive a locking arm 65 as in ordinary practice, and the relation of the parts is such that this arm will hold the anvil either in the position shown in Fig. 6, or a one half turn therefrom.

As an alternative means of accomplishing the conversion of the machine for doing

either ordinary writing or writing with a special shuttle, I may simply provide a notch at 66 in the lower end of the anvil post Fig. 7 so that by adjusting the anvil into one position the notch 66 will come above the lifting arm 11 and therefore the machine will be set for ordinary writing the said lifting arm 11 having no lifting effect on the anvil post. With both of the forms just described for making the machine convertible, it will be understood that the ordinary lifting arm 5 connected with the cap. and fig. keys remains in position for action in the ordinary manner. This lifting arm 5 is connected with the frame or arm before described.

As another way of making the machine convertible, I show in Figs. 10 and 11 a bar 67 carried by arms 67' pivoted at 68 to a pin or shaft 69, which also supports the lifting frame 8'. The pin or shaft 69 is supported in a plate 70 screwed to the post 8 extending up from the main frame. The lifting frame 8' extends all the way across the machine and the construction just described is duplicated at the other side of the machine. At the left of the machine the construction also includes the fig. key lever and the cap. key lever. These are pivoted on the pin or shaft 69 and they have extensions 71 to engage pins 72 on the upwardly extending portion 73 of the frame 8'. The arms 67' carrying the bar 67 are connected with the forwardly extending ears or portions 73 of the frame 8' by means of spring pins 74, said spring pins entering openings in the ears or frame parts 73. By this construction the bar 67 can be maintained in its uppermost position so as to be struck by certain of the keys, it being held in this position by the spring pins 74 engaging the ears 73. In this adjustment of the parts certain of the key levers when they are depressed will depress the rod 67 and this through the arm 67', now securely fastened to the frame 8' by the spring pins, will tilt the said frame on the pivot pin 69 and lifting the arm 5^x carried by the said frame 8' will lift the anvil post to bring the lower row of characters to the printing plane. Certain of the keys, however, are cut out as indicated at 75 so that when these are operated the bar 67 will not be disturbed and the shuttle will remain in its lower position. If, now, it is desired to convert the machine into one for ordinary writing with a standard shuttle, it is simply necessary to withdraw the pins 74 and allow the arms 67' to turn on the pivot pin 69 and thus permit the bar 67 to drop down out of the range of the key levers, which under the adjustment above described were designed to operate this rod. When the bar 67 is thus dropped downwardly the spring pins 74 simply bear upon the solid face of the ears 73 so that the connections

between the arms 67' and the ears 73 is no longer maintained. The machine is now set for ordinary writing, and at this time it will be observed that the lifting of the shuttle for figs. and caps. can be accomplished through the same frame 8' by means of the fig. and cap. key levers with their extensions 71 and the pins 72. The arrangement is such that the connection between these key levers and the frame 8' is a loose one and when the bar 67 is in position to be operated by the letter key levers, the cap. and fig. key levers will not be operated or disturbed by the operation of the frame 8'. In other words, I provide a loose connection between the cap. and fig. key levers and the frame 8' and also a connection which may be adjusted into loose condition between the said frame 8' and the bar 67.

I refer herein to two sets of type and to two sets or a plurality of sets of character keys and it will be understood that I do not mean by this that each set of type constitutes a complete alphabet or complete system, but for convenience I refer to the two divisions of the type and the two divisions or plurality of divisions of character keys and key levers as being arranged in sets.

While my invention is shown as embodied in a machine of the Hammond type, it will be understood that I do not limit myself in this respect, as the broad features of my invention can be carried out in connection with other forms of machines. Nor do I limit myself to the shuttle as the shifting member or means whereby the printing is done from the different sets of type.

The terms "initial position" as used in the appended claims refers to the positions of the shuttle or type carrier before it begins to move circumferentially to bring the particular type to the printing point, and as applied to the vertically shifting shuttle it means either the upper or lower position thereof.

Where I employ the term printing member herein and ascribe to it the capacity to shift for printing with different sets of type, it will be understood that I do not limit myself to the shuttle as the only embodiment of this shifting feature. Where I refer to a shuttle herein, I do so in a generic sense to include any equivalent type carrier.

I do not limit myself to the use of my invention for printing raised characters, nor to printing a code as it may be used for shifting from one row of characters to another when said characters are of such form, size, or are of such number as to have them disposed in a plurality of rows.

The ordinary shift keys for caps and figures are to be used when the machine is employed for ordinary writing. When the special code shuttle is employed the shift keys are not needed.

I claim as my invention:

1. In combination in a type writing machine, a plurality of sets of character keys with connections extending to the printing mechanism and means whereby said printing mechanism may be converted for printing either in the ordinary manner with said keys acting as a single set or as a plurality of sets, substantially as described.

2. In combination in a typewriting machine, printing mechanism including a shuttle or type carrier having thereon a plurality of sets of type and adapted to be shifted for bringing the several sets to the printing plane, a plurality of sets of character keys, one set of keys being adapted to shift the shuttle for bringing the set of type corresponding thereto to the printing plane, and means whereby the machine may be changed for printing with an ordinary shuttle without shifting when those character keys are operated which were adapted to shift the said shuttle, substantially as described.

3. In combination in a typewriting machine a carriage, printing mechanism including adjustable or changeable type carriers having the characters on one shuttle differently spaced from those on another shuttle whereby ordinary printing may be done or printing such as code signs requiring extra spacing, a plurality of sets of character keys acting as a single set for ordinary printing or as a plurality of sets for extra space printing, and variable spacing mechanism for the carriage whereby the machine may be adjusted for either ordinary printing or printing with extra spacing.

4. In combination in a typewriting machine, a printing member, means for shifting the same whereby different sets of type are brought into use, a plurality of sets of character key levers, one set of said levers effecting the shifting and both sets effecting printing, and means for rendering the shifting means ineffective, substantially as described.

5. In combination in a typewriting machine adapted to receive different type carriers interchangeably, one of which carriers requires shifting from one initial position to another to bring a different set or sets of type into use, a plurality of sets of character key levers, one of which sets effects the shifting of said shiftable carrier as well as effecting the printing, and means whereby the shifting ef-

fect of said set of character key levers is eliminated, substantially as described.

6. In combination in a typewriting machine, a paper carriage, means for giving the said carriage different letter spacing movement, printing mechanism including an adjustment or interchange, whereby sets of type of different relative spacings are brought into use, and a plurality of sets of character keys with means for shifting a member of the printing mechanism into a predetermined initial position before printing when the keys of one set are operated, and means whereby the action of the shifting means will be eliminated, substantially as described.

7. In combination in a typewriting machine, a paper carriage, means for giving said carriage different letter spacing movements, a shuttle carrying type, a plurality of character key levers, one set of which shifts the shuttle into a predetermined initial position before printing, and means whereby the shifting action of said shifting set of levers is eliminated, substantially as described.

8. In combination in a typewriting machine, a paper carriage, means for giving said carriage different letter spacing movements, a shuttle carrying type, a post vertically adjustable and in connection with the said shuttle, a plurality of character key levers, one set of which through the vertically movable post shifts the shuttle into a predetermined initial position before printing, and means whereby the shifting action of said shifting set of levers is eliminated, substantially as described.

9. In combination in a typewriting machine, printing means including a shiftable shuttle, a hammer, a post in connection with the shuttle, a trip frame in connection with the hammer mechanism, a supplemental frame arranged adjacent the trip frame and having an arm to engage the post and long and short character key levers, one set of said key levers operating the supplemental frame and both sets operating the trip frame.

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

JNO. A. RUFFIN.

Witnesses:

ALBERT BRYCE,
F. ECKLIN.