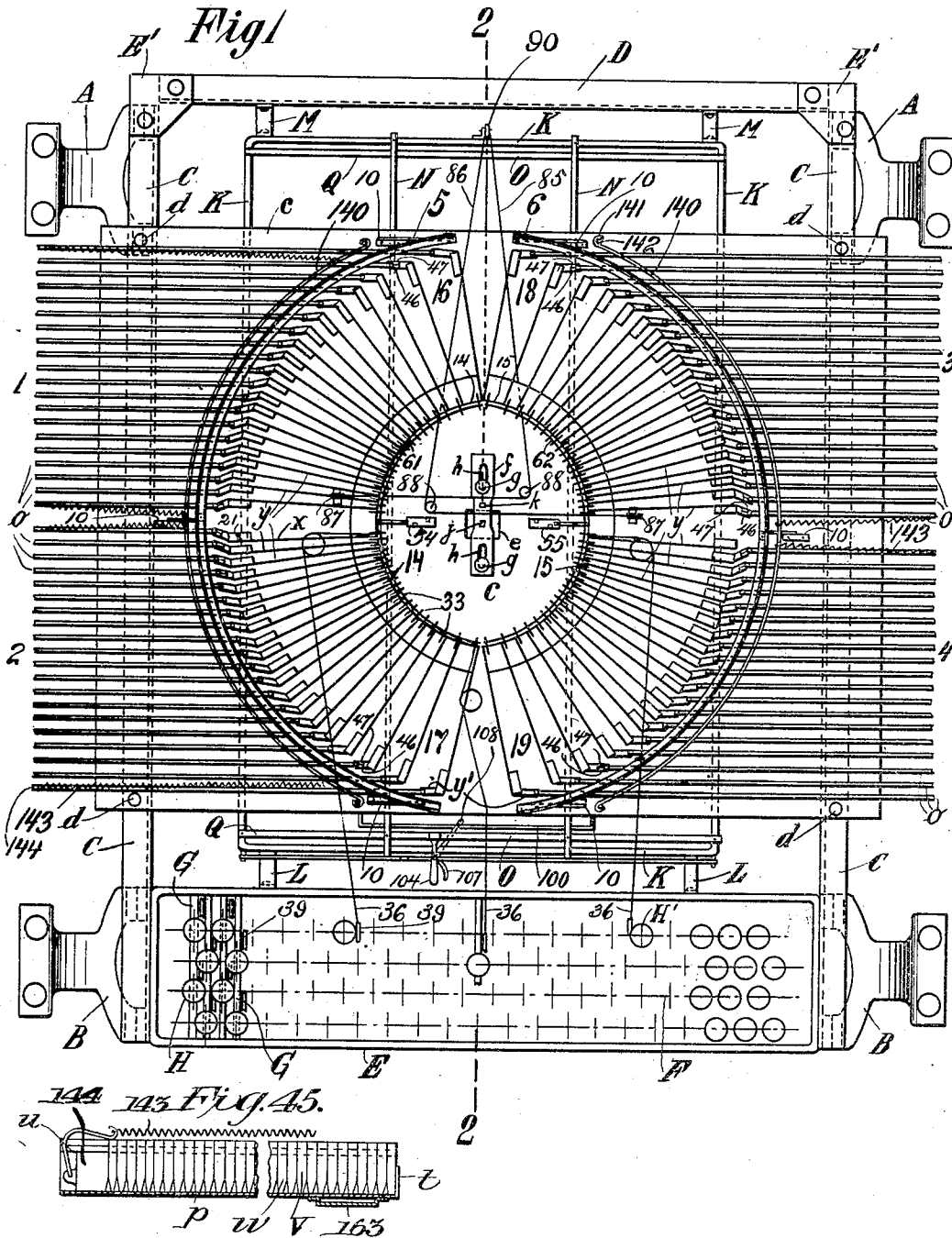


A. HEGER.
KEYBOARD MACHINE FOR SETTING AND DISTRIBUTING TYPE FOR FACSIMILE TYPE WRITING.
APPLICATION FILED JUNE 28, 1911.

1,017,667.

Patented Feb. 20, 1912.

11 SHEETS—SHEET 1.



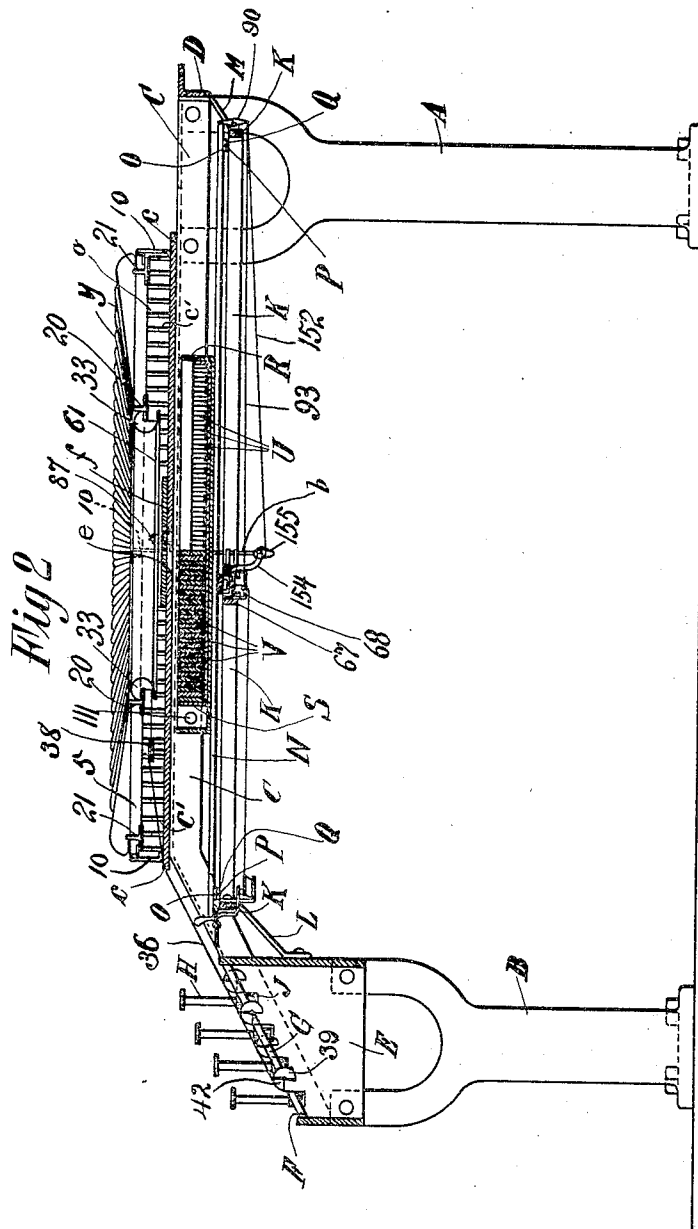
Witnesses:
A. B. Carham
M. M. P. Mann.

Anton Heger Inventor
By his Attorney
Robert H. Heger

A. HEGER.
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11 SHEETS—SHEET 2.



Witnesses:
 W. C. Carham
 M. M. Rimmann

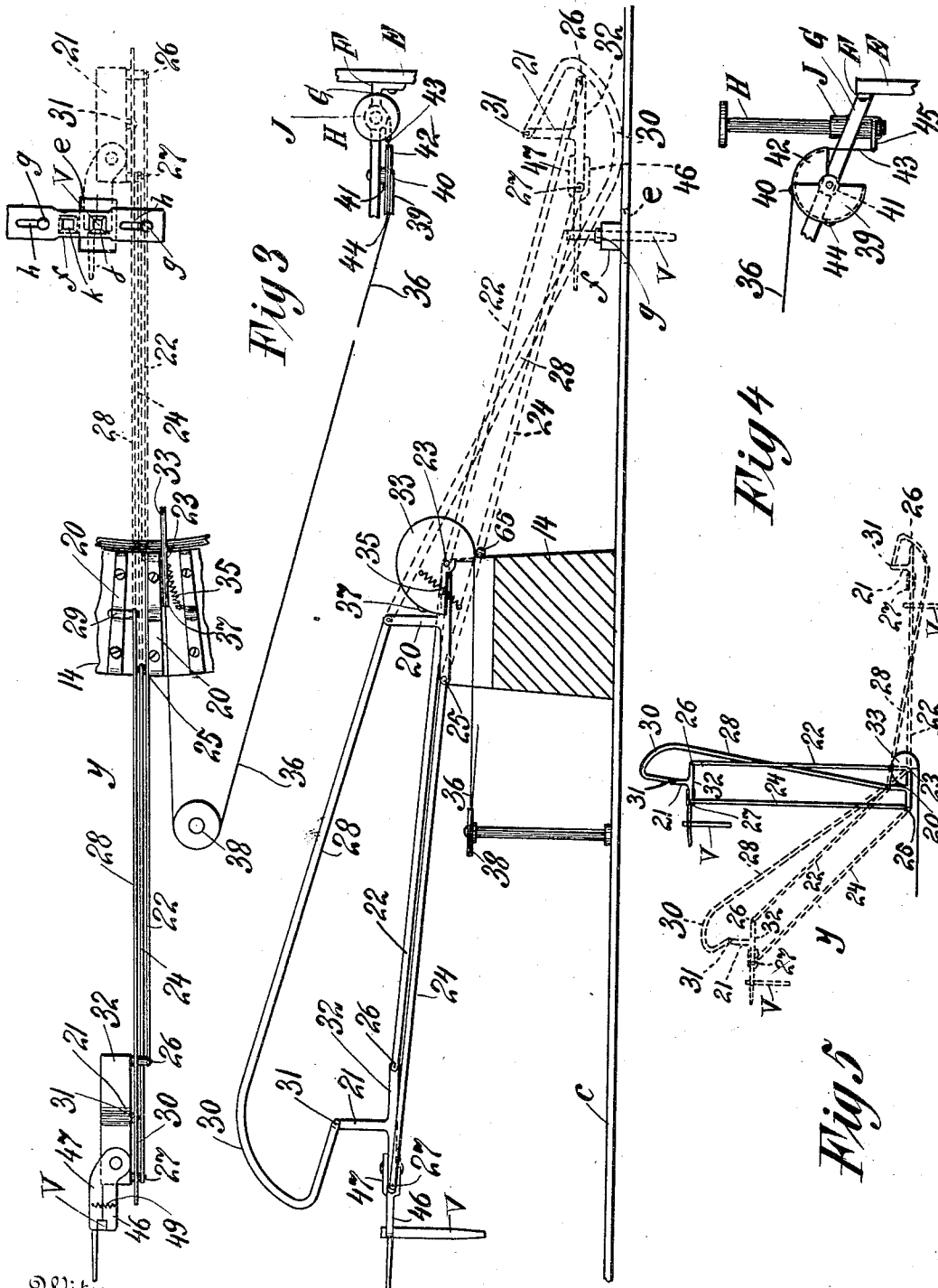
Auston Heger Inventor
 By his Attorney
 Herbert C. Lyden

A. HEGER.
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11 SHEETS—SHEET 3.



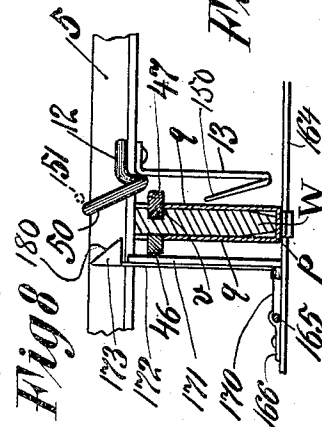
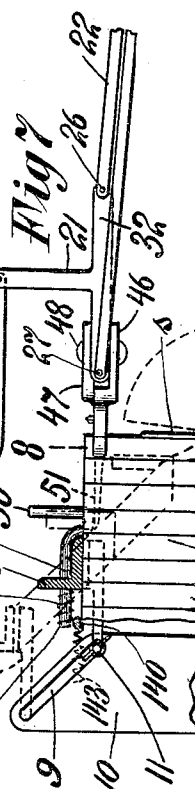
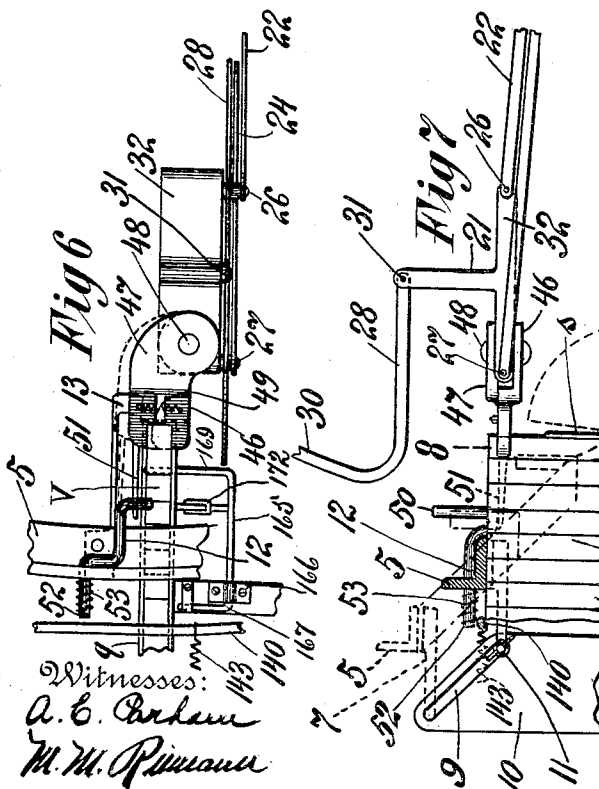
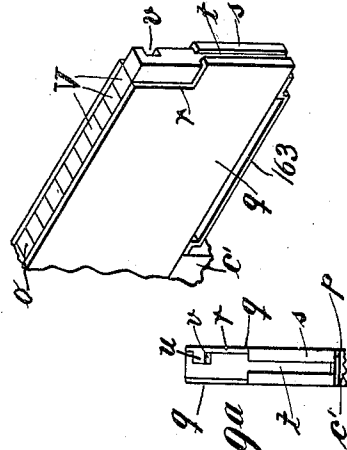
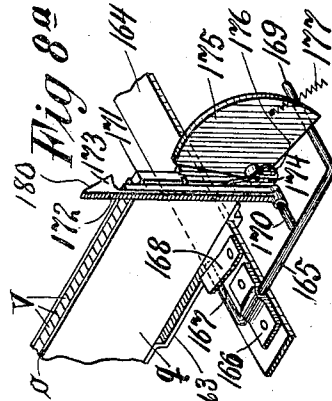
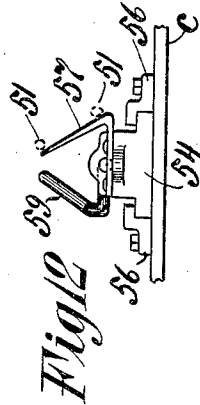
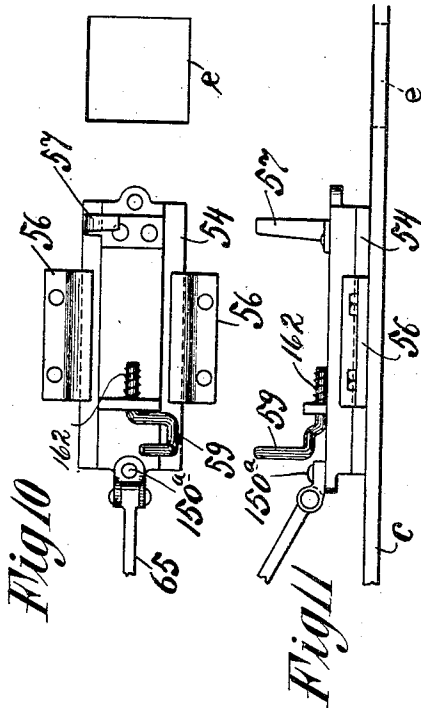
Witnesses:
 A. C. Carhaus
 M. M. Ruman

Anton Heger Inventor
 By his Attorney
 Herbert E. Ogden

KEYBOARD MACHINE FOR SETTING AND DISTRIBUTING TYPE FOR FACSIMILE TYPE WRITING.

1,017,667.

11 SHEETS—SHEET 4.



Witnesses:
A. C. Parker
M. M. Paine

 Inventor
By his Attorney


A. HEGER.

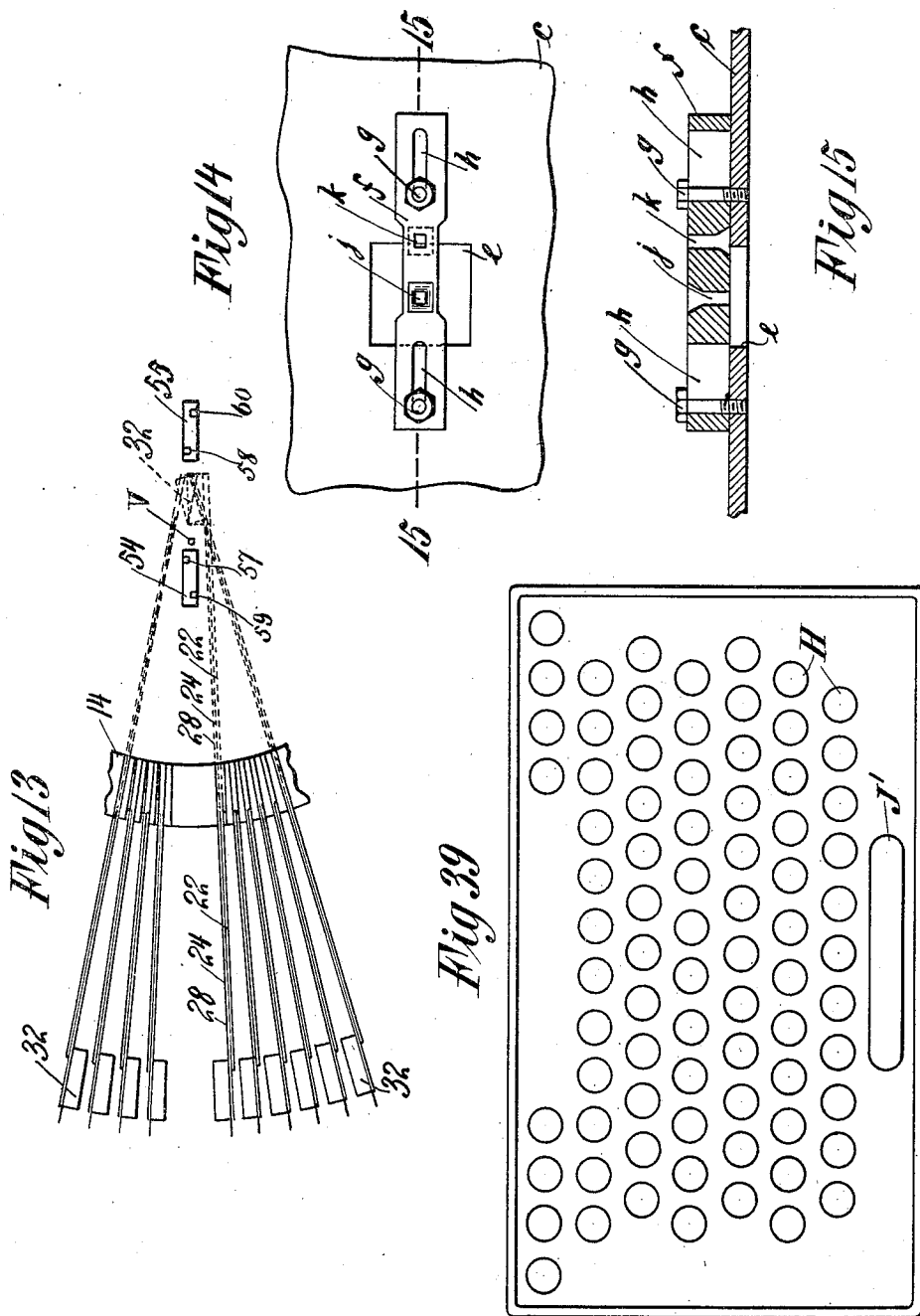
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11 SHEETS—SHEET 5.



Witnesses:
A. B. Carlaw
M. M. Pimmann

Anton Heger Inventor
By his Attorney
H. H. H. H. H.

A. HEGER.

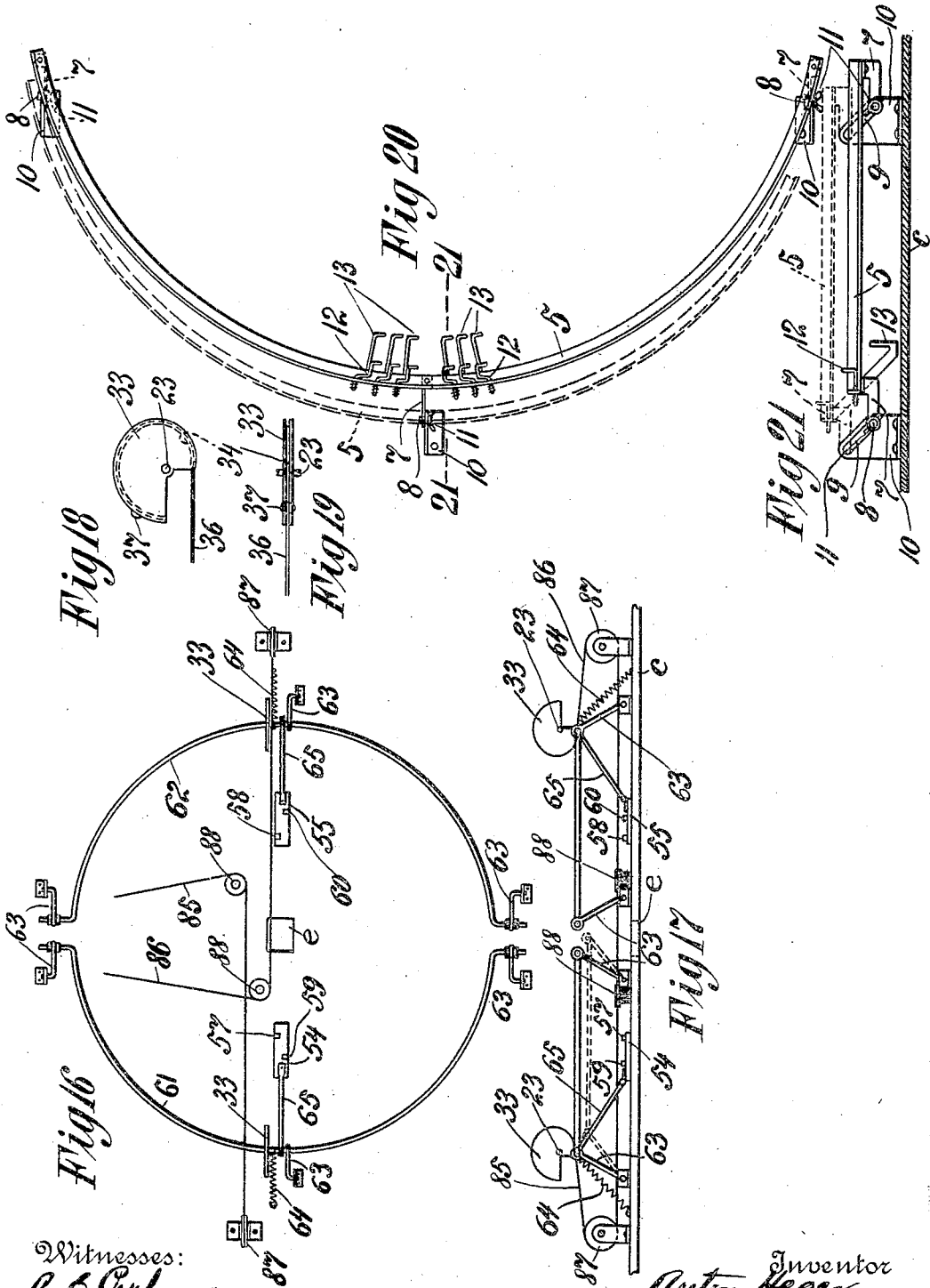
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11 SHEETS—SHEET 6.



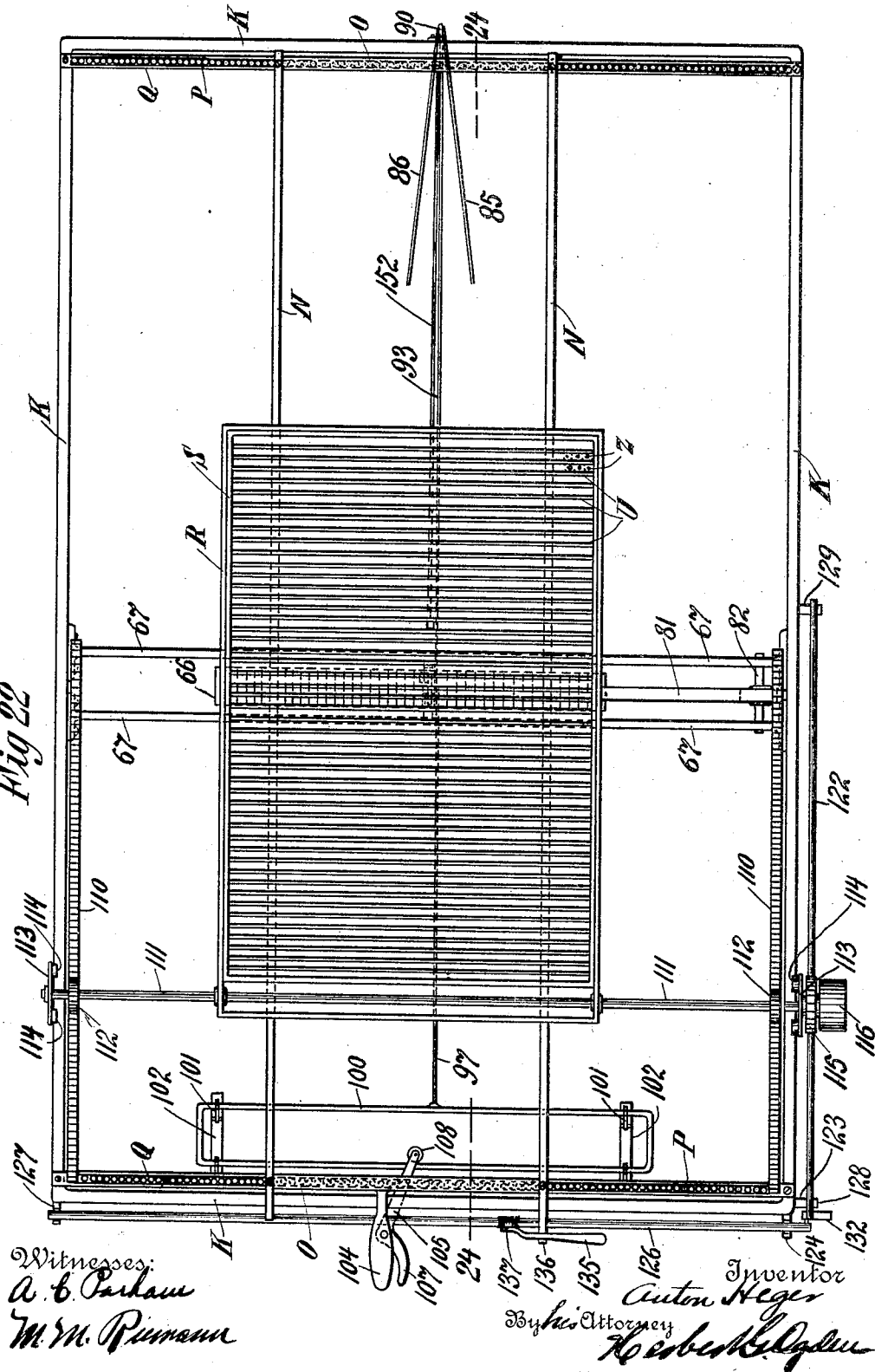
Witnesses:
A. C. Carlson
M. M. Pimmann

Inventor
Auston Heger
By his Attorney
H. C. S. Ogden

KEYBOARD MACHINE FOR SETTING AND DISTRIBUTING TYPE FOR FACSIMILE TYPE WRITING.
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Fig 22



A. HEGER.

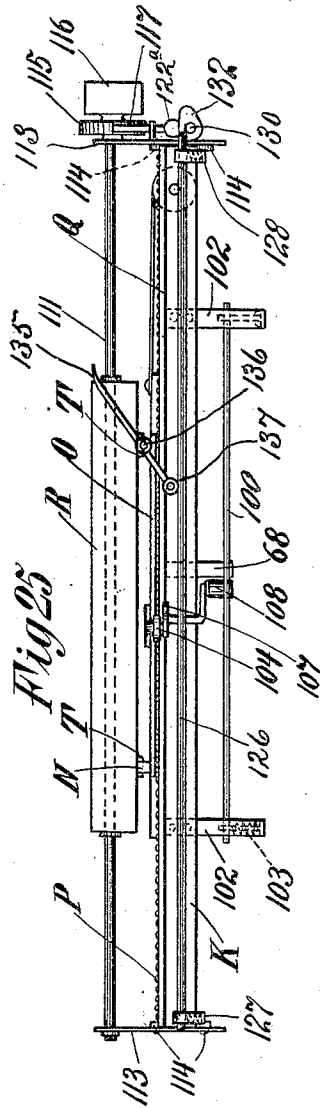
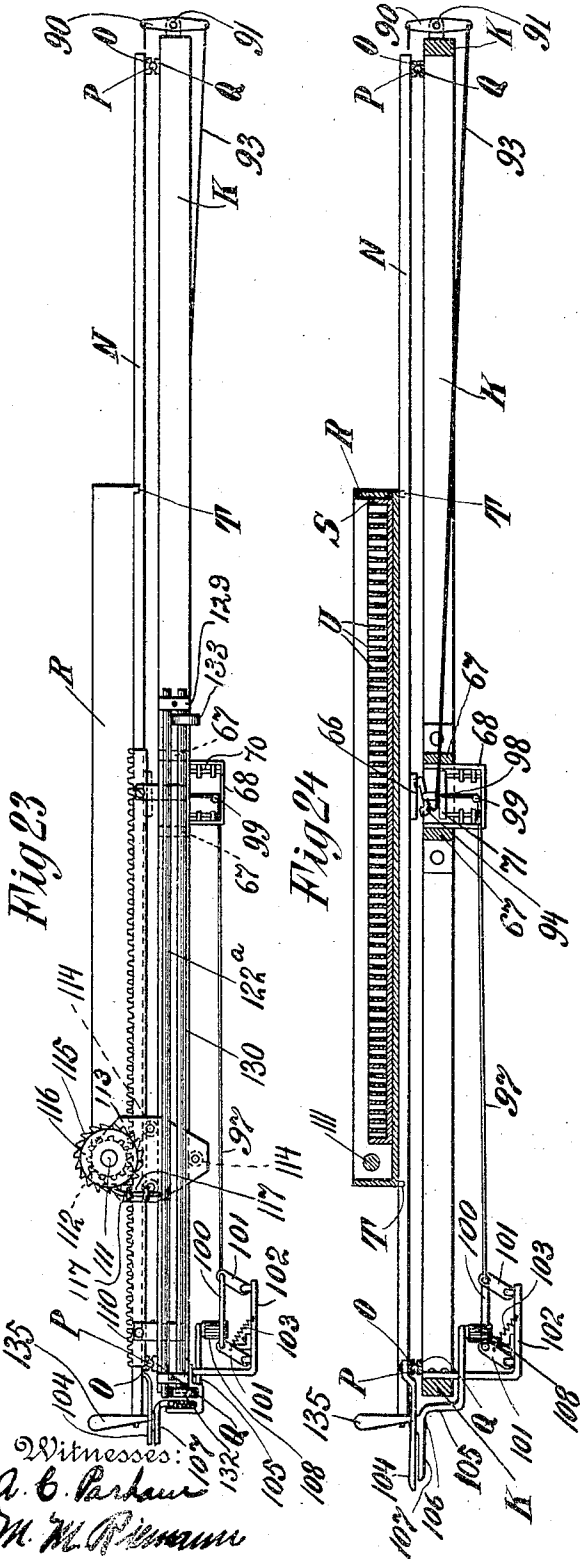
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APPLICATION FILED JUNE 28, 1911.

1,017,667.

Patented Feb. 20, 1912.

11 SHEETS—SHEET 8.



Witnesses:
A. C. Parker
M. W. R. R. R.

Anton Heger, Inventor
By his Attorney
Herbert E. Ogden

A. HEGER.

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11 SHEETS—SHEET 9.

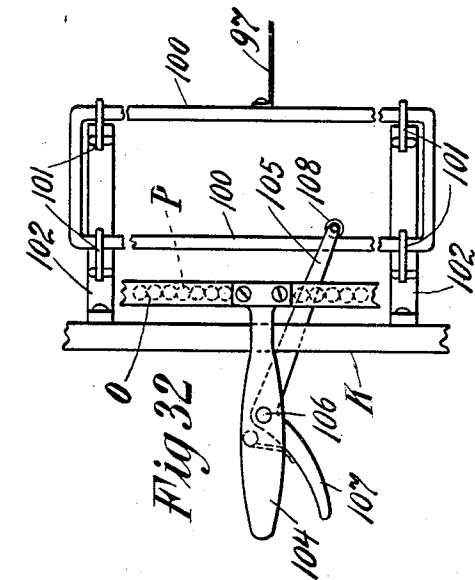


Fig. 32

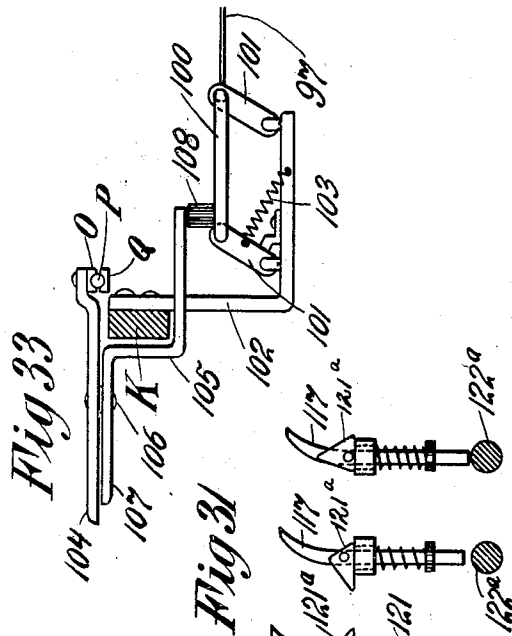


Fig. 33

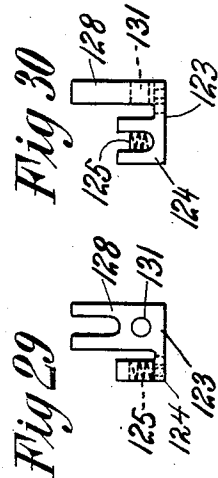


Fig. 29

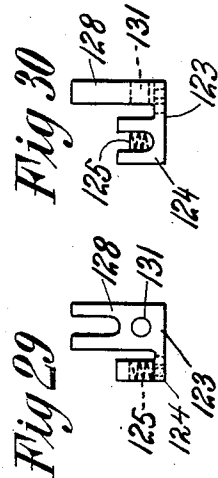


Fig. 30

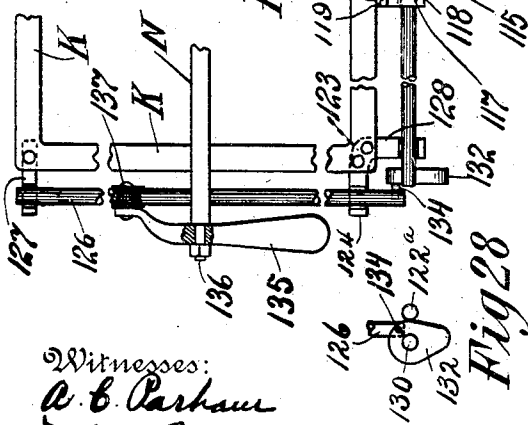


Fig. 26

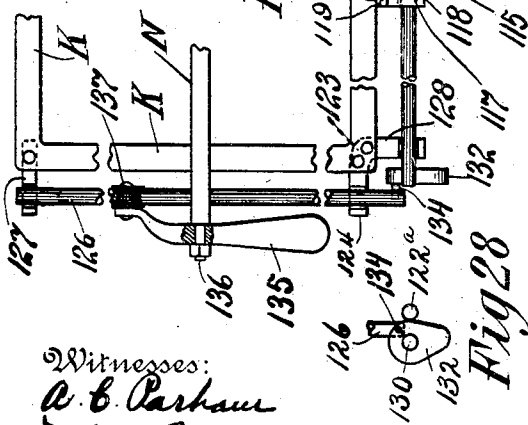


Fig. 27

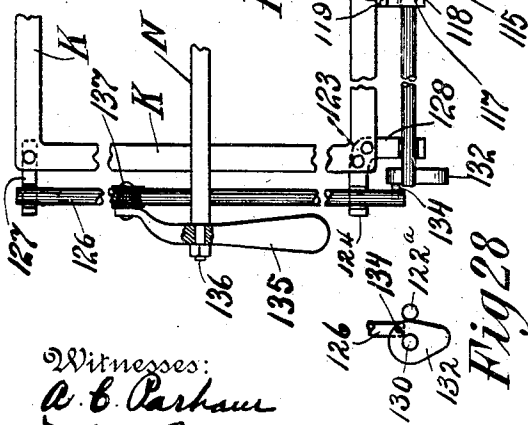


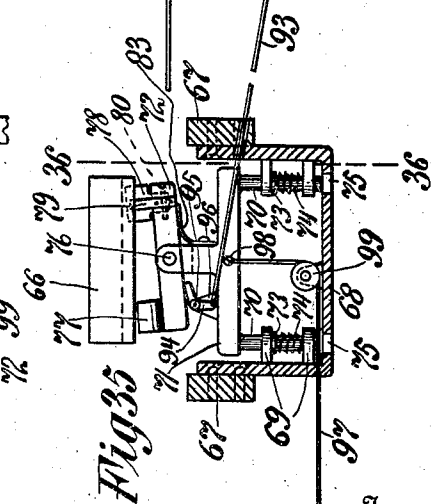
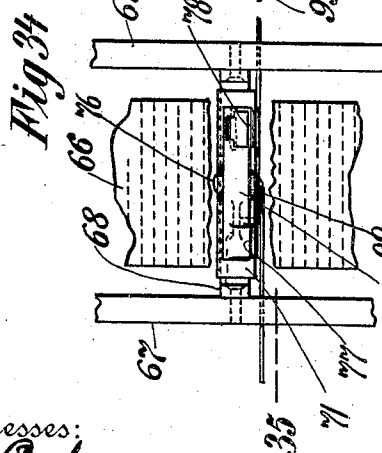
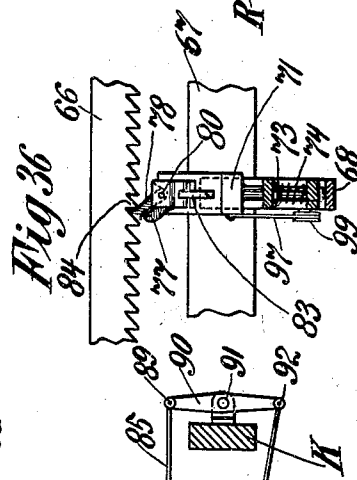
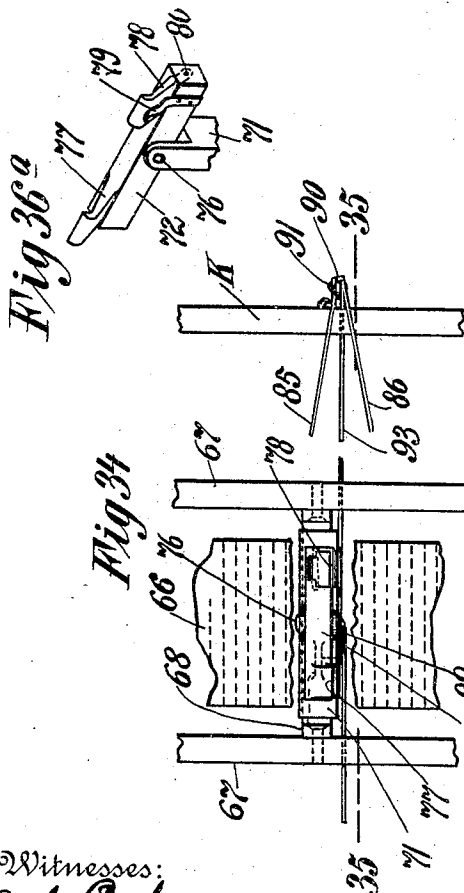
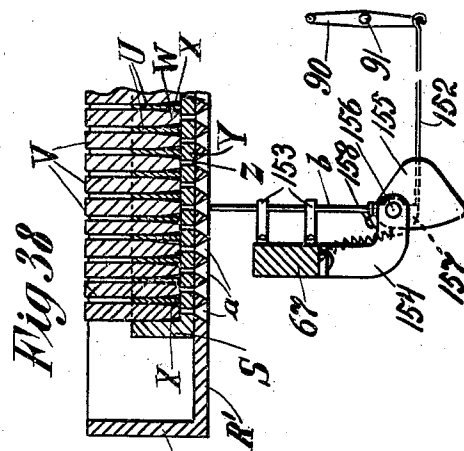
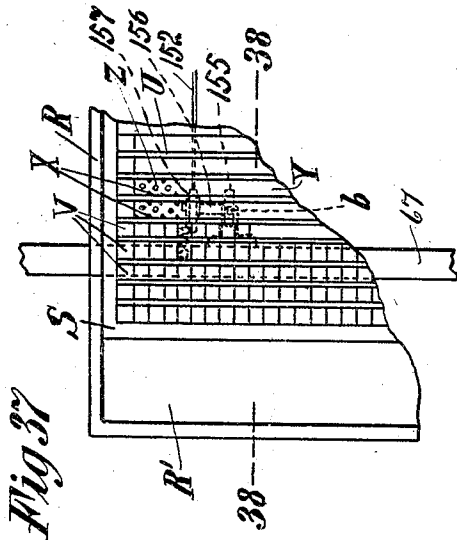
Fig. 28

Witnesses:
A. B. Carham
M. M. Pumaun

Inventor
Anton Heger
By his Attorney
Herbert E. Dyer

A. HEGER.
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11 SHEETS—SHEET 10.

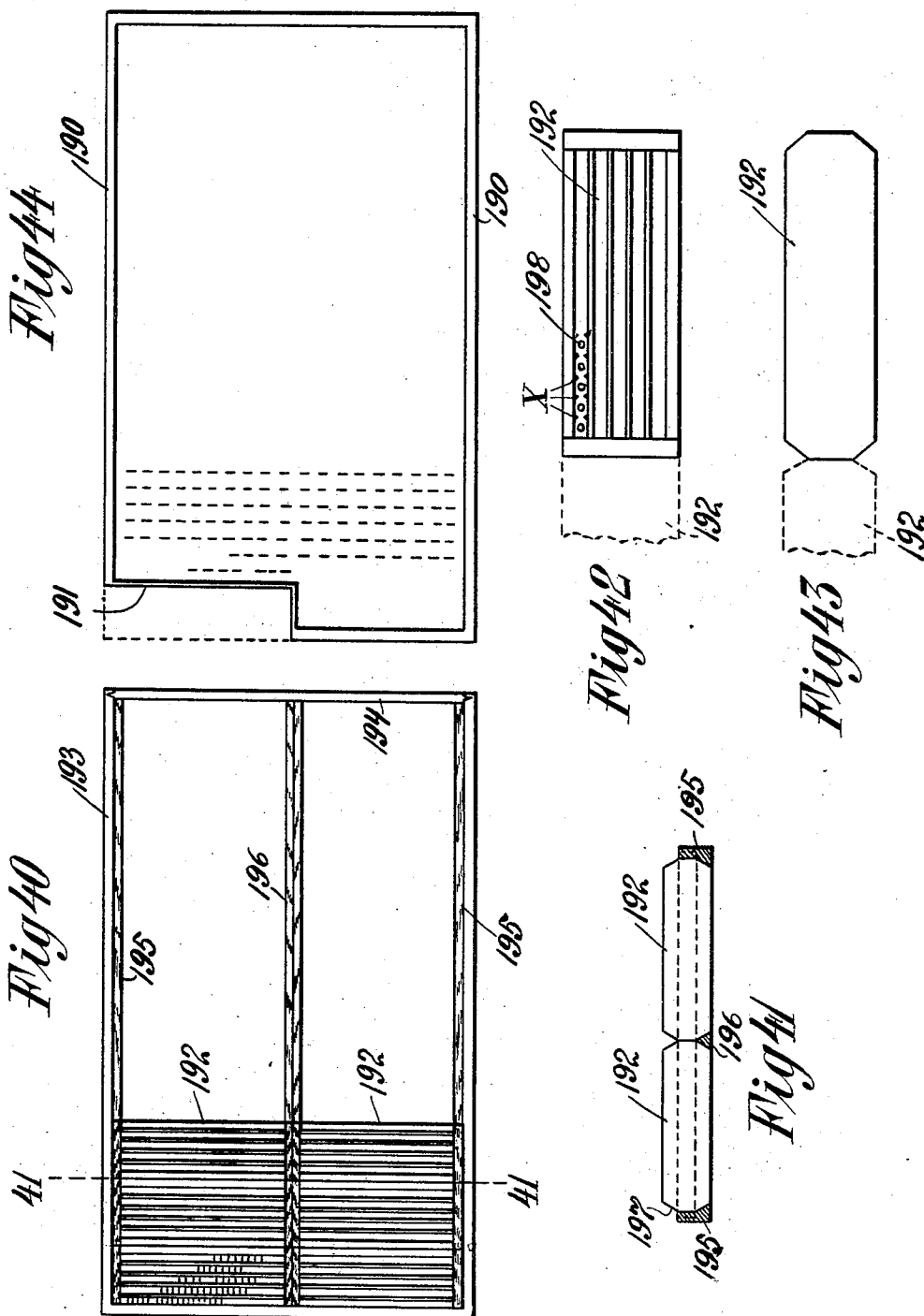


Witnesses:
 A. C. Carhane
 W. M. P. P. P.

Inventor
 Anton Heger
 By *Herbert H. Heger* Attorney

A. HEGER.
 KEYBOARD MACHINE FOR SETTING AND DISTRIBUTING TYPE FOR FACSIMILE TYPE WRITING.
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11 SHEETS—SHEET 11.



Witnesses:
A. C. Pachana
M. M. Primann

Anton Heger Inventor
 By *his Attorney* *Herbert S. Dyer*

UNITED STATES PATENT OFFICE.

ANTON HEGER, OF NEW YORK, N. Y.

KEYBOARD-MACHINE FOR SETTING AND DISTRIBUTING TYPE FOR FACSIMILE TYPE-WRITING.

1,017,667.

Specification of Letters Patent.

Patented Feb. 20, 1912.

Application filed June 28, 1911. Serial No. 635,791.

To all whom it may concern:

Be it known that I, ANTON HEGER, a citizen of the United States, and a resident of the borough of Manhattan, city, county, and State of New York, have invented certain new and useful Improvements in Keyboard-Machines for Setting and Distributing Type for Facsimile Type-Writing, of which the following is a specification, accompanied by drawings.

This invention relates to key-board machines for setting and distributing type for facsimile typewriting, and the objects of the invention are to enable type to be set up, or distributed after having been set up, in a machine analogous to a typewriter, so that facsimile typewritten letters or other work may be rapidly set up by an operator familiar with typewriting machines.

Other objects of the invention are to enable the address of a letter, for instance, to be set up in the same type as the body of the letter, so that in duplicating the letters the body and address will appear as if written on an ordinary typewriter.

In accordance with this invention, I am enabled to obtain perfect alinement between the address and the remainder of the letter and I afford means for securing the same shade of ink on all parts of the reproduced letters.

By setting up the addresses in my machine labor is saved, because the addresses may be used, not only for the letter; but for the envelop, and the addresses may be used as many times as desired.

The machine is designed to obtain the greatest speed compatible with accuracy in setting up letters or other work to simulate typewriting, so that the type may be set up or afterward distributed substantially as fast as letters may be ordinarily typewritten.

By this machine, a great amount of time and labor is saved in preparing the chase of type from which the printing is afterward to be done.

The machine is simple and easy to operate and only requires the knowledge of a typewriter to be obtained by an operator.

To these ends the invention consists of a machine for carrying out all the above objects, embodying the features of construction, combinations of elements, and arrangement of parts substantially as hereinafter

fully described and claimed in this specification and shown in the accompanying drawings, in which—

Figure 1 is a diagrammatic top plan view of a machine embodying the invention; Fig. 2 is a diagrammatic longitudinal sectional elevation on the line 2—2 of Fig. 1; Fig. 3 is an enlarged top plan view partly broken away of one of the type carriers; Fig. 4 is a side elevation of Fig. 3; Fig. 5 is a detail side elevation showing the type carrier in three different positions; Fig. 6 is an enlarged top plan view partly broken away of one of the pick-up mechanisms; Fig. 7 is a side elevation partly in section of Fig. 6; Fig. 8 is a transverse sectional view of Fig. 7 on the line 8—8; Fig. 8^a is a detail perspective view partly broken away of a magazine and the type pushing device; Fig. 9 is a detail perspective view partly broken away of one end of a magazine; Fig. 9^a is an end elevation of Fig. 9; Fig. 10 is a detail top plan view partly broken away of a cam carrier; Fig. 11 is a side elevation of Fig. 10; Fig. 12 is an end view of Fig. 10; Fig. 13 is a detail diagrammatic top plan view partly broken away of several type carriers; Fig. 14 is a detail top plan view of the type guide; Fig. 15 is a sectional side elevation of Fig. 14 on the line 15—15; Fig. 16 is a detail top plan view of portions of the cam shifting and type spacing devices; Fig. 17 is a side elevation of Fig. 16; Fig. 18 is a detail side elevation of one of the cams connected to a type carrier; Fig. 19 is a top plan view of Fig. 18; Fig. 20 is an enlarged detail top plan view of a cam bar; Fig. 21 is a transverse sectional view of Fig. 20 on the line 21—21; Fig. 22 is a top plan view of the frame of the machine, showing the chase, with the upper parts of the machine removed; Fig. 23 is a side elevation of Fig. 22; Fig. 24 is a longitudinal sectional elevation on the line 24—24 of Fig. 22; Fig. 25 is a front end elevation of Fig. 22; Fig. 26 is an enlarged detail top plan view partly broken away of the line spacing mechanism; Fig. 27 is a side elevation of Fig. 26; Fig. 28 is a detail view of a portion of the line spacing mechanism partly broken away; Figs. 29 and 30 are detail views of bearings; Fig. 31 shows detail views of an adjustable ratchet for the line spacing mechanism; Fig. 32 is a top plan view partly broken away of the dog release

for type spacing; Fig. 33 is a side elevation partly in section of Fig. 32; Fig. 34 is a detail top plan view partly broken away of portions of the type spacing mechanism; 5 Fig. 35 is a sectional elevation of Fig. 34 on the line 35—35; Fig. 36 is a sectional elevation of Fig. 35 on the line 36—36; Fig. 36^a is a detail view of the spacing dogs; Fig. 37 is a detail top plan view partly broken away of the ejecting mechanism; 10 Fig. 38 is a sectional elevation of Fig. 37 on the line 38—38; Fig. 39 is a diagrammatic top plan view of the preferred form of key-board; Fig. 40 is a detail top plan view of a suitable chase for the addressing blocks; Fig. 41 is a transverse sectional view of Fig. 40 on the line 41—41; Fig. 42 is an enlarged detail top plan view of several of the addressing blocks; Fig. 43 is a side elevation of Fig. 42; Fig. 44 is a diagrammatic top plan view of one of the printing chases. Fig. 45 is an enlarged detail side view of a type magazine partly in section and partly broken away illustrating 25 means for pushing the type forwardly in the magazines.

The drawings are to be taken as illustrative of suitable means for carrying out the invention, it being understood that various 30 mechanical devices may be devised for the same ends without departing from the spirit of the invention.

Owing to the complication of parts, diagrammatic views have been given in some instances, instead of complete assembled 35 views of all the operative finished parts of the machine. Figs. 1 and 2 in particular are largely diagrammatic, as tending to clearness of illustration. The assembled 40 views where shown are for the purpose of locating the various parts in their relative arrangement, while detail views have been given as far as possible, showing the actual mechanism of the various parts indicated in 45 the diagrams.

Before proceeding to the detailed description of the machine as illustrated, a general outline of the purpose of the machine and preferred arrangement of parts will be 50 given.

The type chase is suitably mounted upon the machine, preferably at the center, and capable of movement, both longitudinally and transversely of the machine, so that 55 suitable feeding mechanism may be provided for type spacing and line spacing. Series of type magazines are provided, in this instance around the periphery of a circle, and extending horizontally. The type 60 are the ordinary typewriter type, and preferably stand upright in the magazines. Means are provided in the form of pick up levers pivoted concentrically with the type magazines and connected to be operated 65 from the key-board, for picking up type one

by one and depositing said type at the center of the machine in the chase. The operation of the pick up levers from the key-board, automatically feeds the chase for type spacing and suitable means are provided for line spacing. Each type as it is taken from a magazine is withdrawn from the magazine vertically and is maintained in vertical position and deposited in the same position in the chase. The type is 75 suspended vertically in the pick-up mechanism, while said mechanism describes the arc of a circle, from the type magazine to the point at which the type is dropped into the chase. By a suitable adjustment of parts, 80 the reverse of this operation may be carried out, so that the type may be picked up one by one from the chase in the same order in which they were placed in the chase, and deposited each in its appropriate magazine. 85 By this means the type may be rapidly set up and as rapidly distributed. There is one pick-up mechanism for each type magazine and all the pick-up mechanisms deposit the type at the same point at the center of the 90 machine.

Referring to the drawings, A represent rear standards and B front standards connected by the side frames C and the end frame D, and suitably braced by plates E' 95 at the rear corners. A suitable key-board frame E is mounted on the front standards B provided with the key-board F comprising the spaced bars or strips G mounted in the frame F, upon which the desired number 100 of push keys H are mounted in sockets J. In the construction shown in Figs. 1 and 2, preferably eighty keys are shown by way of illustration, one of which H' is the type spacing key, it being understood that various 105 forms of key-boards may be used, as for instance, the key-board illustrated in Fig. 39, in which seventy-nine push keys H are used and one type or letter spacing bar J'. This key-board illustrated in Fig. 39 is similar to the ordinary typewriter key-board, and the keys and spacer J' would be mounted as illustrated in Fig. 1. 110

An inner frame K is shown connected by brackets L₁ to the key-board frame E, and 115 by brackets M to the end frame D of the machine for supporting the cradle carriage, which carriage comprises the side bars N connected by grooved end bars O (see Figs. 22, 23 and 24) adapted to slide on the ball 120 bearings provided by the balls P contained in the grooved cross bars Q secured to the inner or auxiliary frame K, it being understood that any suitable form of ball or roller bearings may be provided for enabling the 125 cradle carriage to be readily adjusted transversely of the machine.

The cradle R comprises any suitable box-like frame, in which the chase S is carried, said cradle being provided with lugs T on 130

its bottom, spanning the side bars N of the cradle carriage, which bars form tracks upon which the cradle slides longitudinally and is guided by the lugs. The chase preferably comprises a frame of box-like form, the detail construction of which is shown in Figs. 37 and 38. Transverse partitions U extend across the chase for holding the type V, a few of the type being shown set in the chase, in Figs. 37 and 38. The type V are preferably provided with beveled lower ends W as shown, adapted to fit in conical seats between the partitions provided by the angular ridges X. In the bottom Y of the chase, beneath each type seat is provided an aperture Z and the bottom R' of the cradle is provided with the flaring apertures a corresponding to the apertures Z in the chase, for the purpose of permitting the pusher b to push the type upwardly one by one when re-distributing. Suitable means are provided for feeding and moving the cradle carriage and cradle, which will hereinafter be described.

Before proceeding to the description of the feeding mechanism, the pick-up mechanism for setting and distributing the type will be described. The bed plate c is suitably supported upon the side frames C and secured in position as by means of the bolts d. This bed plate c is provided with an aperture e substantially at the center. As shown in detail in Figs. 14 and 15, a sliding plate f is provided over the aperture e, and guided by pins g mounted in the bed plate c and extending through slots h in the plate f. This plate f is provided with two apertures j and k, the aperture j flaring outwardly and the aperture k flaring downwardly. When type are being picked up from the magazines and set in the chase, the plate f is adjusted with the outwardly flaring aperture j over the central aperture e in bed plate c. When type are being pushed up through the chase, and picked up by the pick-up mechanisms, and re-distributed, the plate f is adjusted with the downwardly flaring aperture opposite the aperture e. This is a detail of the invention, which aids in guiding the type.

The type magazines indicated at o, (Fig. 1) are mounted horizontally upon the supports c' on the bed plate c and the inner ends of the magazines preferably form substantially a circle about the center of the machine. These type magazines are preferably arranged in four series or sets, 1, 2, 3 and 4, the series 1 and 2 being at one side of the machine and the series 3 and 4 at the other side of the machine, for convenience of manipulation. A detail of one of the magazines is shown in Figs. 9 and 9', in which the magazine is shown to consist of the bottom p and sides q having an open top. The upper front corners of the sides

q are preferably cut away or recessed at r, thus leaving the upper end of the type at the front of the magazine exposed and ready to be grasped by a pick-up mechanism. The front s of a magazine is slotted at t to enable means to be provided for pushing the type longitudinally and rearwardly in the magazine as they are re-distributed. One side q of each magazine is provided with an inner longitudinal ridge or flange u with which the notches v in the type cooperate. The notches v in the type fit over the flange u loosely, as indicated in Fig. 9', and are by this means maintained in upright position in the magazine. The further function of the slot v in the side of the type will hereinafter be referred to.

Semi-circular cam bars 5 and 6 are mounted on the bed plate c above and adjacent to the inner ends of the type magazines. These cam bars are shown more in detail in Figs. 20 and 21. The function of the cam bars 5 and 6 is to support pick-up and distributing cams, one set of which is used for setting the type and the other set for distributing the type. These cams cooperate with the pick-up levers to cause the pick-up mechanisms to grasp or release type. Each cam bar is provided at its ends and at the center with arms 7 having pins 8 cooperating with upwardly inclined slots 9 in brackets 10 mounted on the bed plate c. Adjusting means in the form of wing nuts 11 cooperate with the pins 8 and by this means a cam bar 5 may be lowered and carried forwardly as indicated in full lines in Figs. 20 and 21, or raised and carried backwardly as indicated in dotted lines and secured in either position. The setting cams 12 are lifted into operative relationship with the pick-up mechanisms when a cam bar is in the position indicated in full lines and the distributing cams 13 are then moved downwardly and in inoperative position. When a cam bar is moved upwardly and outwardly, the distributing cams 13 are moved into position to cooperate with the pick-up mechanisms and the setting cams 12 are moved out of position. The description and function of these cams 12 and 13 will be given in connection with the type carriers.

Concentric with the cam bars 5 and 6 are arranged the semi-circular supports 14 and 15 for the stationary bearings of the type carriers. These type carriers are represented diagrammatically at y in Figs. 1 and 2, and are preferably divided into four sets, 16, 17, 18 and 19, corresponding to the four sets of type magazines 1, 2, 3 and 4. A type carrier is shown in detail in Figs. 3, 4 and 5, together with operative means connected to a push key H for actuating the type carrier. Each type carrier normally lies in retracted position over a type at the inner

end of its corresponding magazine, in readiness to pick up said type and carry it to the chase at the center of the machine. This is the normal position of the type carriers during the setting operation.

The object of the type carriers is to carry the type back and forth from the magazines to the center of the machine in setting the type, and in redistributing them and also maintain the type in vertical position, as indicated at V, Figs. 3, 4 and 5, and I have devised a means for accomplishing this purpose, although obviously I am not to be limited to the precise devices shown in the drawings. I have found that by a system of three levers pivoted at three stationary points at one end and pivoted at three points to a movable carrier equidistant from the three stationary points, I am enabled to rotate the carrier through an arc of a circle and maintain said carrier always in the same upright position relative to the bed plate of the machine. The type V suspended from gripping jaws mounted on the carrier will describe the arc of a circle and be maintained in vertical position, ready to be dropped into the aperture *j*, in the plate *f* at the center of the machine, or vice versa the type will be removed from the aperture *k* at the center of the machine in redistributing the type and deposited vertically into its proper magazine. Series of bearing blocks 20 are provided upon the supports 14 and 15 side by side, as shown more particularly in Fig. 3 and the carriers 21 preferably correspond to the bearing blocks 20. The lever 22 is secured fast upon a pivot pin 23 extending through one of the bearing blocks 20 at its inner end, while the lever 24 is pivoted at 25 to the outer end of the same bearing block 20. These two levers 22 and 24 are pivoted at 26 and 27 respectively to a carrier 21 and the distances between the pivots 23 and 26 and 25 and 27, is constant, referring more especially to Figs. 3, 4 and 5. A lever 28 is pivoted at 29 at the top of the adjacent bearing block 20 and is curved or bowed at 30, as shown and pivoted at 31 to the top of the carrier 21, the distance between the pivots 29 and 31 being equal to the distance between the pivots 23 and 26 and 25 and 27. In moving the type carrier levers 22, 24 and 28 about their respective pivots, the pivots 26, 27 and 31 describe circles and the carrier 21 always remains upright and its base 32 always remains substantially parallel to the bed plate *c*. The lever 28 is bowed at 30 in order to permit the combination of three levers to drop as far as necessary, in moving toward the center of the machine. In moving toward the type magazines, it is not necessary that the levers pass below or appreciably below the horizontal, it being understood that as Figs. 3, 4 and 5 are viewed, the type magazine

would be at the left and the chase would be at the right.

The connections shown for actuating the type carriers are the same for all the carriers and comprise a segmental cam 33 secured to the pivot pin 23 and provided with a grooved periphery 34. (Figs. 18 and 19). A retracting spring 35 is connected to said cam and to the support 14. A cord 36 passes over the cam 33 in the groove 34 and is secured to the periphery of the cam as by means of the pin 37. Cord 36 passes over the idler pulley 38 and thence forwardly to a half round pulley 39 to which the cord is pinned at 40. Said half round pulley is secured on the stud 41 on one of the bars or strips *G* of the key-board. Pivoted on the same stud 41 is a mutilated pulley 42 having a cord 43 passing over the periphery of the same and pinned to the pulley at 44. The lower end of the cord 43 is connected to a pin 45 carried by the lower end of the push key *H*, so that when said push key is depressed, the cord 43 rotates mutilated pulley 42, thereby rotating half round pulley 39 and retracting the cord 36, which in turn rotates the segmental cam 33 against the retractive force of the spring 35. Rotation of cam 33 rotates the pivot pin 23, and as the lever 22 is secured fast to said pin, said lever is rocked upwardly, carrying with it the levers 24 and 28 and the carrier 21 from the position indicated in full lines in Fig. 4, to the position indicated in dotted lines.

Each of the carriers 21 is provided with pick-up devices in the form of a fixed jaw 46 (Figs. 6 to 8) permanently secured to the base 32 of the carrier as by means of brazing or otherwise, and a movable jaw 47 pivoted to the carrier as by means of the pivot pin 48. The jaws are normally held in closed position by the spring 49 connected across the jaws. The jaws 46 and 47 are indicated diagrammatically at *y'* on Fig. 1 and it will be seen that said jaws are arranged at different angles on the type carriers *y* in accordance with the particular set of carriers 16, 17, 18 and 19, upon which the jaws are located, so that said jaws may fall opposite the inner ends of the magazines for picking up or depositing type. As Fig. 1 is viewed, the fixed jaws 46 are always located on the carriers toward the front of the machine, while the movable jaws 47 are always located to the rear of the machine. The cam bars 5 and 6 are provided with the pick-up cams 12 arranged adjacent the inner end of the type magazines and extending above said magazines, when a cam bar, as for instance, the bar 5, is in operative position for picking up the type, as indicated in Figs. 6, 7 and 8. These cams 12 may be preferably of hooked shape with upwardly inclined ends 50 adapted to cooperate with a finger or pin 51 extending outwardly from a

movable jaw 47, of the pick-up device. As the carrier approaches the type magazine, the pin 51 first bears upon the outer portion of the inclined end 50 of the cam 12, as indicated in dotted lines in Fig. 8. and said pin is pushed transversely in the descent of the carrier, opening the jaw 47, so that in the final position of the carrier, as indicated in Figs. 6, 7 and 8, the pin 51 has passed under the lower end of cam 12 and the jaw 47 under the force of the spring 49 has entered the slot *v* in the side of one of the type V, thus gripping said type in readiness to withdraw the type from a magazine when the proper push-key is pushed. The pick-up cams 12 are loosely pivoted in the cam bars and the shanks 52 are provided with springs 53, so that as a carrier lifts a type out of a magazine, the finger 51 in rising pushes the inclined portion 50 of the corresponding cam 12 transversely, thus permitting the carrier to rise. After the finger 51 has left its corresponding cam, said cam snaps back into position. At the center of the machine suitable cams are provided for again opening the jaw 47 and permitting the type V to be dropped through the aperture *j* in plate *f* into the chase. At the center of the machine, two slides 54 and 55 are provided, slidable in the guides 56. The slides are provided with depositing cams 57 and 58, and the pick-up cams 59 and 60. The fingers 51 of all the carriers in the sets 16 and 17 at one side of the machine coöperate with the depositing cams 57, while the fingers 51 of all the carriers in the sets 18 and 19, at the right of the machine coöperate with the depositing cam 58. Each carrier whether at one side of the machine or the other describes an arc extending beyond the center of the machine, bringing the carrier when in position for depositing the type, at a point beyond the center of the machine (see Fig. 13) and on the opposite side of the center away from the magazine from which the type is withdrawn. The slides 54 and 55 are normally in retracted position, as indicated in Figs. 16 and 17 and means are provided for automatically moving forward that slide on the same side of the machine as the type carrier which is being operated, in order that the depositing cam 57 or 58 may be in position to coöperate with the corresponding type carrier. Arranged concentrically with the cam bars 5 and 6, are movable semi-circular rocking bars 61 and 62 (Figs. 16 and 17), pivoted at their ends and at the center to the rocking levers 63, in turn pivoted to the base plate *c*. Retracting springs 64 normally hold said rocking bars 61 and 62 in retracted position. The cams 33 connected to the type carriers are adapted to bear upon said rocking levers 61 and 62, so that as a type carrier is operated, the cam 33 depresses a bar 61 or 62. Each bar 61 or 62 is connected by an arm 65

with a slide 54 or 55, so that as a bar is depressed, a slide is pushed forward, bringing the appropriate cam into operative position adjacent the aperture at the center of the machine. In setting the type, a cam 57 or 58 coöperates with the pick-up mechanism, to open the jaws at the proper moment. The construction of the cams 33 is such that a rocking bar 61 or 62 is depressed and the appropriate slide 54 or 55 moved forward into operative position before the type carrier has completed its stroke, so that the setting cam 57 or 58 is in proper position previous to the arrival of the pick-up mechanism at the center of the machine.

The apparatus for type spacing is connected to be operated from the rocking bars 61 and 62 and this spacing mechanism will now be described. Extending transversely across the cradle carriage underneath the bars or tracks N is a toothed bar or rack 66, preferably extending slightly beyond the sides of the cradle, as indicated in Fig. 22. Extending transversely between the side bars K of the cradle carriage are the supporting and operative parts of the type spacing mechanism. A yoke 68 (Figs. 34 and 35) is secured to the transverse bars 67 and provided with lugs or bearings 69 in which are supported the pins 70 extending downwardly from the frame 71, adapted to carry the pivoted ratchet bar 72. Each pin 70 is provided with a collar 73 and between said collar and one of the lugs 69 is compressed a spring 74 which normally tends to force the pins 70 and the frame 71 outwardly and upwardly. Apertures 75 are provided in the bottom of the yoke 68 to permit vertical movement of the pins 70 and means are provided, to be described, for retracting the frame 71 against the tension of the springs 74 and thus withdraw the ratchet bar 72 downwardly when desired, to move the type spacing mechanism to an inoperative position. The ratchet bar 72 is pivoted at 76 on the frame 71 and said ratchet bar is provided with the fixed tooth 77 and a movable spring pressed tooth 78 having a spring 79 secured to the ratchet bar 72 and bearing against the tooth, normally tending to press said tooth 78 forward. The tooth 78 is pivoted longitudinally of the bar 72 on the pivot pin 80. With the position of the parts shown in Figs. 34 to 36, the ratchet bar 72 is in normal position with the spring pressed tooth 78 engaging one of the teeth of the rack 66. A retracting spring 81 (Fig. 22) secured to the rack 66 at one end and coiled at the other end upon a spindle 82 secured to the bar 67 tends to feed the cradle carriage N to the right, as Fig. 1 is viewed. This feeding movement of the cradle carriage is normally resisted by the spring tooth 78, and a spring 83 secured to

the frame 71 and bearing upwardly under one end of the ratchet bar 72 normally tends to maintain said spring tooth 78 in engagement with the rack 66. In this position of the parts, it will also be seen that the teeth 77 and 78 are slightly offset. When the end of the ratchet bar 72 carrying the fixed tooth 77 is rocked upwardly by suitable means, the fixed tooth 77 is carried into engagement with the same tooth 84 on the rack 66 which was engaged by the spring tooth 78 and the cradle carriage is fed forward the distance afforded by the offset between said teeth 77 and 78, so that a type seat on the chase is brought directly under the aperture *j* in the slide *f* through which the type are deposited. The spacing movement of the cradle carriage, cradle and chase, takes place when the ratchet bar 72 is again rocked on the backward movement of a type carrier, thus disengaging the fixed tooth 77 from a tooth 84, on the rack and permitting the rack to be fed forward one tooth and stopped by the spring tooth 78. The spring 79 on the spring tooth 78 aids in taking up the jar of the movement and insures the exact forward feed of the chase.

In order to automatically rock the ratchet bar 72, a cord 85 is secured to rocking bar 61, (Figs. 16 and 17) and another cord 86 is secured to rocking bar 62. These cords extend outwardly over idler pulleys 87 and then inwardly over idler pulleys 88, and rearwardly to one end 89 of a pivoted lever 90 pivoted at 91 on the frame K. The opposite or lower end 92 of lever 90 is connected by a cord 93 with one end of the bell crank lever 94 pivoted at 95 on a bracket 96 on the frame 71. The free end of the bell crank lever is adapted to bear under the end of the ratchet bar 72 provided with the fixed tooth 77, so that when a cord 85 or 86 is placed in tension by the inward movement of either of the rocking bars 61 or 62, the lever 90 is rocked and the cord 93 is placed under tension, thus rocking the bell crank lever 94 and moving the fixed tooth 77 upwardly against the tension exerted on the opposite end of the ratchet bar 72 by the spring 83. When the tension on the connecting cords 85, 86 and 93 is released, the ratchet bar 72 assumes its normal position again, as indicated in Fig. 25, having permitted the cradle carriage to be fed forward one tooth on the rack bar 66 under the influence of the spring 81.

In order to move the frame 71 downwardly, and moving dogs or teeth 77 and 78 into inoperative position, so that the cradle carriage may be moved back and forth as desired, a cord 97 is secured at 98 to the frame 71 and passes downwardly under a roller 99 and thence forwardly to a substantially rectangular frame 100, pivoted on the levers 101 carried by the frames 102,

secured to the front end of the auxiliary frame K. A suitable spring 103 normally tends to retract the levers 101. A handle 104 is secured to the front rail O of the cradle carriage (Figs. 22 to 25) and an angular lever 105 is pivoted at 106 to the lever 104 and provided with a handle 107. Said angular or bent lever 105 extends rearwardly and is provided with a vertically pivoted roller 108 adapted to bear against the front portion of the frame 100. Obviously, the handle 104 and with it the bent lever 105 travels transversely across the machine with the cradle carriage. By grasping the handles 104 and 107, thus moving the movable handle 107 toward the handle 104, the frame 100 will be retracted against tension of the spring 103, thus tightening the cord 97 and retracting the frame 71, against the tension of the spring 74, and moving the ratchet bar 72 and the teeth 77 and 78 downwardly out of engagement with the rack bar 66. The cradle carriage is moved transversely to the right or left across the machine by moving the handle 104.

Suitable means are provided for line spacing, as follows: The auxiliary frame K is provided with the racks 110 at each side (Figs. 22 to 33), and a transverse shaft 111 extends through the cradle R and is provided with pinions 112 traveling on the racks 110. The shaft 111 is provided with guide plates 113 having the rollers 114 above and below the side frames K for guiding the movement of the cradle longitudinally of the machine. The shaft 111 is also provided at one end with the ratchet wheel 115 and the hand wheel 116 outside of the ratchet wheel, so that the line feeding may take place step by step by means of the ratchet or may be controlled as desired, by the hand wheel 116. A vertically movable spring pressed pawl 117 is mounted loosely in the collar 118 and a spring 119 secured to the collar presses against the upper end of said pawl pressing the pawl against the ratchet wheel 115. The pawl 117 is provided with a stop 120 and a retracting spring 121 is compressed between the collar 118 and the stop 120, tending to force the pawl downwardly. In order to vary the vertical position of the pawl 117, said pawl is provided with a triangular block 121^a pivoted thereto at 122 and as shown in Fig. 31 the height of the lower end of the pawl is varied in accordance with the position of the block 121^a. Means are provided for actuating the pawl upwardly as by means of the horizontal rod 122^a, which has a predetermined vertical movement. The amount of feed for line spacing is thus varied by varying the block 121^a. An angular bearing 123 is secured at one front corner of the auxiliary frame K and is shown in detail in Fig. 29, viewed from the front.

Fig. 30 shows a detail of this bearing feature from the side. The socket portion 124 of bearing 123 is provided with a spring 125 and supports one end of a transverse vertically movable rod 126. The other end of rod 126 is supported in a bearing 127 at the other side of the machine, similar to the socket bearing 124 of bearing 123. The angular portion 128 of bearing 123 extends at the side of the machine and provides a socket for holding the longitudinal rod 122^a. The other end of said rod is supported in a similar socket 129 on the side of the frame K. A rod 130 is supported in apertures 131 in the socket portions 128 and 129 of the bearings, and said rod 130 is provided with the cams 132 and 133 adapted to raise and lower the rod 122^a when the rod 130 is rocked. Cam 132 is provided with a pin 134 connected to the rod 126 at the front of the machine and a hand lever 135 is pivoted at 136 on the cradle carriage N and provided with a roller 137 bearing upon the rod 126. By turning the outer end of the lever 135 upwardly, the roller 137 depresses the rod 126, thereby forcing the pin 134 on cam 132 downwardly and rocking the rod 130. The high portions of the cams 132 and 133 raise the rod 122^a which contacts with the lower end of the vertically movable pawl 117, thus raising said pawl and rotating the ratchet wheel 115 for a given distance. The shaft 111 of ratchet wheel 115 is rotated and the cradle is fed longitudinally as the pinions 112 travel on the racks 110. Obviously after the end of the lever 135 has been raised, depressing the transverse rod 126, said lever and the entire cradle carriage may be moved transversely of the machine by hand, as the roller 137 rolls on rod 126.

In the operation of picking up the type from the magazines and depositing them in the chase, means should be provided for automatically forcing the type in the magazines toward the inner ends and for this purpose I provide semi-circular rods 140, outside of the cam bars 5 and 6 secured as by means of hooks 141 to pins 142 on the bed plate *c* (Fig. 1). Tension springs 143 are secured to these rods 140 and also suitably secured to sliding blocks 144 at the outer ends of the type magazines see Fig. 45, so that all the type in each magazine are forced toward the center at all times during the operation of type setting and as soon as a type is removed from the inner end of a magazine, another type takes its place in readiness to be picked up.

The operation of distributing the type will now be described. In distributing the type, the tension springs 143 are first relieved of their tension by unhooking rods 140 from the pins 142 and withdrawing said rods outwardly to a sufficient distance at

the sides of the machines. The bolts *g* of the plate *f* (Figs. 14 and 15) are loosened and said plate *f* is moved longitudinally to bring the downwardly tapering aperture *k* over the central opening *e* in the bed plate *c*, so that the type may be forced upwardly through said opening *k*. The pins 150^a connecting the rods 65 to the slides 54 and 55 are removed, (Fig. 10) and said slides are withdrawn from the guides 56 and replaced in said guides with the distributing cams 59 and 60 toward the center. The pins 150^a are then replaced in the opposite ends of the slides 54 and 55, reconnecting the rods 65 thereto. Wing nuts 11 (Figs. 20 and 21) are loosened and the cam bars 5 and 6 are moved upwardly in the slots 9 in the brackets 10, moving the pick-up cams 12 to inoperative position, and moving the distributing cams 13 into operative position adjacent the inner ends of the type magazines, as shown in Fig. 7, in dotted lines. During the setting of the type, a cord 152 connected to actuate the pusher rod *b* (Figs. 37 and 38) has been disconnected from the lever 90 and this cord 152 is now again connected to the lower end of said lever 90, so that the pusher rod *b* will be actuated at each stroke of the machine. The pusher rod *b* is vertically movable in the bearing brackets 153 carried by one of the transverse bars 67 which supports the type spacing mechanism. A downwardly extending bracket 154 is connected to bar 67 and a cam 155 is pivoted on shaft 156 to said bracket 154. The cam shaft 156 is provided with a half-round pulley 157 over which the cord 152 is secured at the point 158. The pusher *b* bears upon the periphery of the cam 155 and when said cord 152 is retracted by movement of the lever 90, the half-round pulley 157 is rotated and the cam 155 to which the shaft is secured is also rotated, raising the pusher rod *b*, which pushes one of the type *V* upwardly from the chase in readiness to be grasped by the jaws on one of the carriers. The cord 152 and cam 155 are actuated by the same mechanism shown in Figs. 16 and 17, which actuates the type spacing mechanism of the machine. Assuming that a letter has been set up in the chase and it is desired to redistribute the type, the chase is adjusted in the machine as if the type were to be re-set for the letter, but instead of setting type the pick-up levers pick up the type from the chase in the same order in which they were set, distributing them in their appropriate magazines. The machine goes through the same motions as in setting the type, but reverses the operation.

As hereinbefore stated, when the pick-up levers are in normal position, the jaws 46 and 47 each grasp a type at the end of a magazine and the movable jaw 47 is in closed position. When the cam bars 5 and

6 are moved upwardly in their slides 10, the bent ends 150 of the distributing cams 13 (Fig. 8) engage the fingers 51 on the movable jaws 47 and pull said jaws outwardly, so that the normal position of the jaws is then open in position for redistributing the type. When a push key H is depressed, the pick-up levers of one carrier are rotated, and a bar 61 or 62 is depressed, thus sliding the proper slide 54 or 55 toward the center to bring a distributing cam 59 or 60 into position to cooperate with the finger 51 on the movable jaw 47. The distributing cam causes the jaw to open and then close over a type V which has been forced upwardly by the pusher rod b. On the back stroke, the finger 51 on the movable jaw, forces the cam 59 outwardly against the tension of its spring 162 and the type is carried backwardly to its proper magazine and deposited therein. The distributing cam 13 adjacent the end of the magazine engages the finger 51 and opens the movable jaw to leave the type in position in the magazine.

In the operation of distributing type, means are provided for pushing the type longitudinally and backwardly in the magazines. This mechanism is shown in detail in Fig. 8^a and is partially shown in Figs. 6, 7 and 8, but in said latter figures the pushing mechanism is moved backwardly out of operative position, as indicated, for the type setting operations. The magazines are provided underneath with guides 163 in which slides a curved bar 164. Pivoted adjacent each magazine is a rocking bar 165 suitably held upon the bar 164 as by means of the plate 166. The bent toe 167 of each bar 165 is preferably held by a spring 168. The outer end 169 of each rocking bar 165 extends opposite the end of a magazine and intermediate the ends 167 and 169 is a stud 170 carrying an upright stiff bar 171 and a spring member 172 having a hooked end 173. A bracket 174 is secured to the front of the magazine and upon this bracket is pivoted the segmental pusher 175. A pin 176 in the bracket 174 limits the downward movement of the pusher 175 and a retracting spring 177 is connected to said pusher and to any suitable part of the frame of the machine. The bar 164 is moved outwardly to the position indicated in Fig. 8^a during the operations of distributing type, so that the spring members 172 lie opposite the inner ends of the type magazines. As the type carriers move toward the magazines carrying a type, a fixed jaw 46 engages the beveled portion 180 of the hooked end 173 of member 172 and forces said spring member outwardly, without rocking the bar 165, since the spring 168 is stronger than the spring 172. When the type carrier makes its next movement from the type magazine

to the center of the machine, a fixed jaw 46 moving upwardly, engages under the hooked end 173 of the spring member 172, and carries said member upwardly a short distance, at the same time rocking the bar 165 against the pressure of spring 168. The stiff upright bar 171 carries the hooked end 173 of member 172 away from the fixed jaw 46, until said hooked end 173 slides off said jaw. The type carrier continues its movement, but the rocking of the bar 165 has been sufficient to lift the bent end 169 of the bar and rock the segment 175 on its pivot, thus pushing the type which has been deposited in the magazine inwardly and leaving a space for the reception of the next type. This operation of pushing the type inwardly in the magazine takes place whenever a type carrier is actuated toward the center of the machine, so that there are always spaces at the ends of the magazines to receive the type.

In Fig. 22, the chase S is intended for circulars and other work in which no address is inserted. In Fig. 44 a form of chase 190 adapted to receive an addressing block is shown, the corner 191 of the chase being recessed to receive an addressing block 192. In Figs. 40 and 41, a form of chase 193 is shown for receiving the addressing blocks 192 and setting up the addresses. In this chase 193 the frame is provided with a removable end 194. The sides 195 and the center partition 196 are beveled, as shown, and the addressing blocks, which comprise small frames, are beveled at their ends 197, as shown. By this means the addressing blocks are centered in the chase and may be readily manipulated. The addressing blocks are provided with apertures 198 in their bottoms and are otherwise constructed substantially like the chase shown in Figs. 37 and 38, so that the addresses may be set up one after another in the blocks assembled in the chase 193, and then a block is fitted into the cut-away portion 191 of the chase 190 and the letter is ready to be printed. The type are distributed from the addressing blocks in the same manner described in connection with the chase.

I claim and desire to obtain by Letters Patent the following:

1. In a machine for setting type for facsimile typewriting, the combination with the key-board and keys, of a movable chase, type magazines, and type carriers connected to be operated by the keys for positively conveying type from the magazines to the chase and for depositing said type directly in the chase.

2. In a machine for setting type for facsimile typewriting, the combination with the key-board and keys, of a movable chase, type magazines adapted to hold the type in vertical position, and means connected to be operated by the keys for picking up type

from the magazines, and depositing said type directly in the chase, while maintaining said type in vertical position throughout the movement from the magazines to the chase.

3. In a machine for setting type for fac-simile typewriting, the combination with the key-board and keys, of a movable chase, type magazines, adapted to hold the type in vertical position, and means connected to be operated by the keys for picking up type from the magazines, and depositing said type directly in the chase, while maintaining said type vertical, whereby the type faces the same way in the chase as in the magazines.

4. In a machine for setting type for fac-simile typewriting, the combination with a key-board and keys, of a movable chase, type magazines, type carriers connected to be operated by the keys for conveying the type from the magazines to the chase, pick-up devices carried by said carriers, type spacing mechanism connected to move the chase and controlled by said carriers, and mechanism for line spacing.

5. In a machine for setting type for fac-simile typewriting, the combination with a key-board and keys, of a movable chase, type magazines, type carriers connected to be operated by the keys for picking up type from the magazines and setting said type in the chase, said type carriers holding the type in vertical position throughout the movement from the magazines to the chase, type spacing mechanism connected to move the chase and controlled by the type carriers and mechanism for line spacing.

6. In a machine for setting type for fac-simile typewriting, the combination with a key-board and keys, of a movable chase, type magazines, type carriers, pick-up mechanisms carried by the carriers, type pick-up magazine cams and type depositing chase cams adapted to cooperate directly with the pick-up mechanisms and operative connections between said type carriers and the keys.

7. In a machine for setting type for fac-simile typewriting, the combination with a key-board and keys, of a movable chase, type magazines, type carriers, pick-up mechanisms carried by said carriers, type pick-up magazine cams and type depositing chase cams adapted to cooperate with the pick-up mechanisms, type spacing mechanism controlled by the carriers, line spacing mechanism, and operative connections between said carriers and the keys.

8. In a machine for setting type for fac-simile typewriting, the combination with a key-board and keys, of a movable chase, type magazines, type feeding devices for feeding the type forwardly in said magazines, type carriers connected to be oper-

ated by the keys for conveying type from the magazines to the chase and setting said type in the chase, pick-up mechanisms carried by said carriers, pick-up cams at the magazines, depositing cams above the chase, said pick-up and depositing cams cooperating with the pick-up mechanisms, and type spacing mechanism controlled by said carriers.

9. In a machine for setting type for fac-simile typewriting, the combination with a key-board and keys, of a movable chase, type magazines, adapted to hold the type in vertical position, type carriers connected to be operated by the keys for conveying the type from the magazines to the chase and holding said type vertically throughout the movement, type feeding devices for feeding the type forwardly in the magazines, pick-up jaws carried by the carriers, pick-up cams mounted adjacent the magazines, depositing cams mounted above the chase, said pick-up and depositing cams cooperating with the pick-up jaws, type spacing mechanism controlled by the carriers and line spacing mechanism.

10. In a machine for setting type for fac-simile typewriting, the combination of a key-board and keys, type magazines adapted to hold the type, a movable chase, type carriers, pick-up mechanisms on the carriers, operative connections between the keys and carriers, means for automatically operating the pick-up mechanisms to grasp the type, and means for automatically operating said pick-up mechanisms to release the type and deposit them directly in the chase.

11. In a machine for setting type for fac-simile typewriting, the combination of a key-board and keys, type magazines adapted to hold the type, a movable chase, type carriers, pick-up mechanisms on the carriers, operative connections between the keys and carriers, means for automatically operating the pick-up mechanisms to grasp the type, means for automatically operating said pick-up mechanisms to release the type and deposit them in the chase, and type spacing mechanism controlled by the carriers.

12. In a machine for setting type for fac-simile typewriting, the combination of a key-board and keys, type magazines adapted to hold the type, a movable chase, type carriers, pick-up mechanisms on the carriers, operative connections between the keys and carriers, means for automatically operating the pick-up mechanisms to grasp the type, means for automatically operating said pick-up mechanisms to release the type and deposit them in the chase, type spacing mechanism controlled by the carriers, and line spacing mechanism.

13. In a machine for setting type for fac-simile typewriting, the combination with a

key-board and keys, of a movable chase, type magazines, means connected to be operated by the keys for automatically picking up type from the magazines and automatically depositing said type directly in the chase, and means controlled thereby for type spacing.

14. In a machine for setting type for fac-simile typewriting, the combination with a magazine and a chase, of a type carrier for conveying type from the magazines and chase, said carrier comprising levers constructed and arranged to maintain the type in vertical position in its passage from the magazine to the chase.

15. In a machine for setting and distributing type for fac-simile typewriting, the combination with the key-board and keys, of a movable chase, type magazines, and a plurality of type carriers corresponding to the keys and connected to be operated by the keys for conveying type from the magazines to the chase and setting said type in the chase, and for distributing the type from the chase to the magazines.

16. In a machine for setting and distributing type for fac-simile typewriting, the combination of a key-board and keys, of a movable chase, type magazines, type carriers, pick-up mechanisms carried by said carriers, type pick-up and depositing magazine cams, type depositing and pick-up chase cams, means for adjusting said cams, and type ejecting devices for ejecting type from the chase, said type ejecting device being controlled by the type carriers, and means for automatically pushing the type backwardly in the magazines.

17. In a machine for setting and distributing type for fac-simile typewriting, the combination with a key-board and keys, of a movable chase, type magazines, a plurality of type carriers corresponding to the keys, pick-up mechanisms on the carriers, operative connections between the keys and carriers, and means for automatically operating the pick-up mechanisms to convey type back and forth between the magazines and the chase in either direction.

18. In a machine for setting and distributing type for fac-simile typewriting, the combination with a key-board and keys, of a movable chase, type magazines, a plurality of type carriers corresponding to the keys, pick-up mechanisms on the carriers, operative connections between the keys and carriers, means for automatically operating the pick-up mechanisms to convey type back and forth between the magazines and the chase in either direction, type spacing mechanism controlled by the type carriers, and line spacing mechanism.

19. A key-board machine for setting and distributing type, comprising in combination with the keys, one for each type, of a

plurality of type carrier levers corresponding in number to the keys and adapted to both set and distribute the type in the same machine.

20. In a machine for setting type for fac-simile typewriting, the combination of a key-board and keys, type magazines adapted to hold the type with the type face ends adapted to be grasped by pick-up mechanisms, a movable chase, type carriers connected to be operated by the keys and provided with pick-up mechanisms for grasping the type face ends of the type, said carriers being constructed to convey the type from the magazines to the chase without altering the angular position of the type, and deposit said type rear end foremost in the chase.

21. In a machine for setting type for fac-simile typewriting, the combination of a key-board and keys, type magazines adapted to hold the type with the type face ends adapted to be grasped by pick-up mechanisms, a movable chase, type carriers connected to be operated by the keys and provided with pick-up mechanisms for grasping the type face ends of the type, said carriers being constructed to convey the type from the magazines to the chase without altering the angular position of the type, and deposit said type rear end foremost in the chase, and means affording provision for enabling said type to be picked up type face foremost from the chase and deposited rear end foremost in the type magazines by means of said type carriers without altering the angular position of the type.

22. In a machine for setting type for fac-simile typewriting, the combination with the base or frame of the machine, of a key-board and keys, type magazines, a movable chase arranged centrally of the machine, pivoted type carriers connected to be operated by the keys and all adapted to convey the type from the type magazines and deposit them rear end foremost in the chase at a given point on the machine.

23. In a machine for setting type for fac-simile typewriting, the combination with the base or frame of the machine, of a key-board and keys, type magazines, a movable chase arranged centrally of the machine, pivoted type carriers connected to be operated by the keys and all adapted to convey the type from the type magazines and deposit them rear end foremost in the chase at a given point on the machine, and means affording provision for conveying type from the chase at said given point on the machine and depositing the type rear end foremost in the magazines.

24. In a machine for setting type for fac-simile typewriting, the combination of a key-board and keys, type magazines, a movable chase, type carriers connected to be

operated by the keys for conveying type back and forth between the magazines and the chase, automatic means for mechanically feeding the type forward in the magazines, 5 type spacing mechanism for moving the chase controlled by the type carriers, and line spacing mechanism for moving the chase.

25. In a machine for setting type for fac-
simile typewriting, the combination with
the key-board and keys, type magazines and
movable chase, of type carriers adapted to
be operated by the keys, said type carriers
comprising type pick-up mechanisms and
levers connected thereto and adapted to
maintain said type pick-up mechanisms at
the same angle relatively to the base of the
machine at all times throughout the arc of
movement of the levers.

26. In a machine for setting type for fac-
simile typewriting, the combination with a
key-board and keys, of type magazines
adapted to hold the type upright, a movable
chase having means for separately holding
each type, pivoted type carriers connected
to be operated by the keys for conveying
type from the magazines to the chase, said
type carriers being movable through angles
greater than 90°, pick-up mechanisms
mounted on said carriers and adapted to
hold said type upright throughout their arc
of movement, whereby the type are deposit-
ed in the separate holding means in the
chase, without altering the direction in
which the type face.

27. In a machine for setting type for fac-
simile typewriting, the combination with a
key-board and keys, of type magazines
adapted to hold the type upright, a movable
chase having means for separately holding
each type, pivoted type carriers connected
to be operated by the keys for conveying
type from the magazines to the chase, said
type carriers being movable through angles
greater than 90°, pick-up mechanisms
mounted on said carriers and adapted to
hold said type upright throughout their arc
of movement, whereby the type are deposited
in the separate holding means in the chase,
without altering the direction in which the
type face, and means for reversing the op-
eration of the type carriers to convey type
from the chase to the magazines.

28. In a machine for setting type for fac-
simile typewriting, the combination with a
key-board and keys, of type magazines, a
movable chase, a plurality of type carriers
corresponding to the keys movable in the
arcs of circles and connected to be operated
by the keys for conveying type in either di-
rection between the magazines and chase,

the angular position of the type remaining
unchanged in the movement in either direc-
tion, and each type carrier being adapted
to pick up and return the same type which it
deposited in the chase. 65

29. In a machine for setting type for fac-
simile typewriting, the combination with a
key-board and keys, of type magazines, a
movable chase, pivoted type carriers con-
nected to the keys and having type pick-up
mechanisms, said type carriers being adapt-
ed to carry type in either direction between
the magazines and chase, the point at which
the type are deposited in the chase being
separated from the magazines by a distance
greater than the length of a type carrier
from its pivot to its pick-up mechanism,
said type being held at the same angle in
the magazine, in the chase and while in
transit. 80

30. In a machine for setting type for fac-
simile typewriting, the combination with a
key-board and keys, of type magazines, a
movable chase, type carriers connected to
be operated by the keys, said chase being
provided with separate compartments for
holding each type, and said carriers being
adapted to carry type in either direction
between the magazines and chase. 90

31. In a machine for setting type for fac-
simile typewriting, the combination with a
key-board and keys, of type magazines, a
movable chase, type carriers connected to be
operated by the keys, said type carriers lift-
ing each type separately and upwardly free
from the magazines and holding it in an
upright position, carrying the type through
the arc of a circle and depositing said
type downwardly in the chase, said type
being held in the chase in an upright posi-
tion, and said carriers also being adapted to
return the type to the magazines. 100

32. In a machine for setting type for fac-
simile typewriting, the combination with
a key-board and keys, of type magazines, a
movable chase, type carriers connected to be
operated by the keys for carrying type in
either direction between the type magazines
and chase, said type being held by the car-
riers at the same angle, while in transit,
and being deposited in or lifted from the
chase and magazines at tangents to the
arcs of the circles described by the type car-
riers. 115

In testimony whereof I have signed this
specification in the presence of two sub-
scribing witnesses.

ANTON HEGER.

Witnesses:

HENRY SHELDON,
M. M. RIEMANN.