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PATENTED MAY 12, 1908.

M. W. HAZEN & R. W. UHLIG.

TYPE WRITER.

APPLICATION FILED JAN. 28, 1905.

2 SHEETS--SHEET 1.

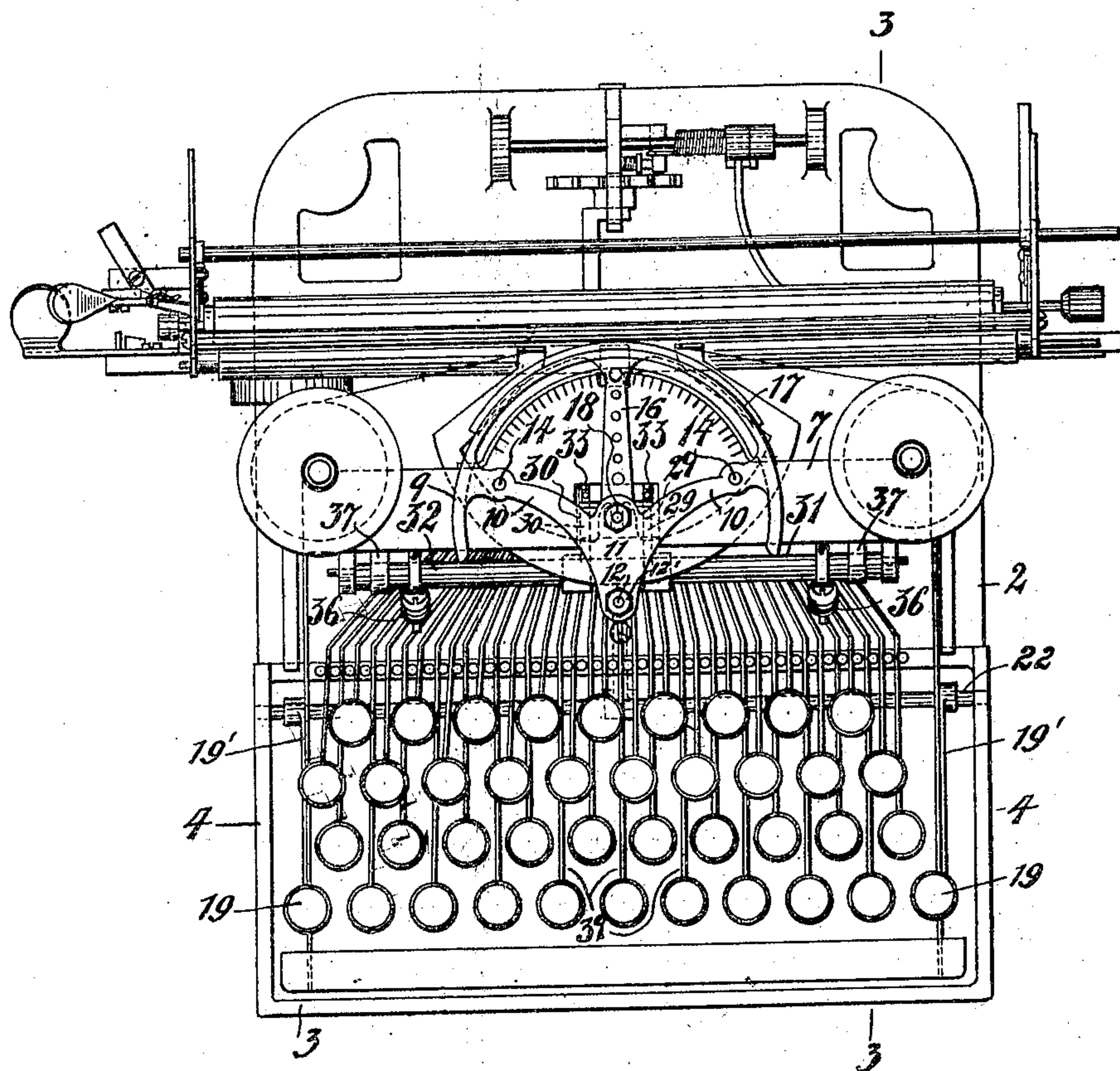
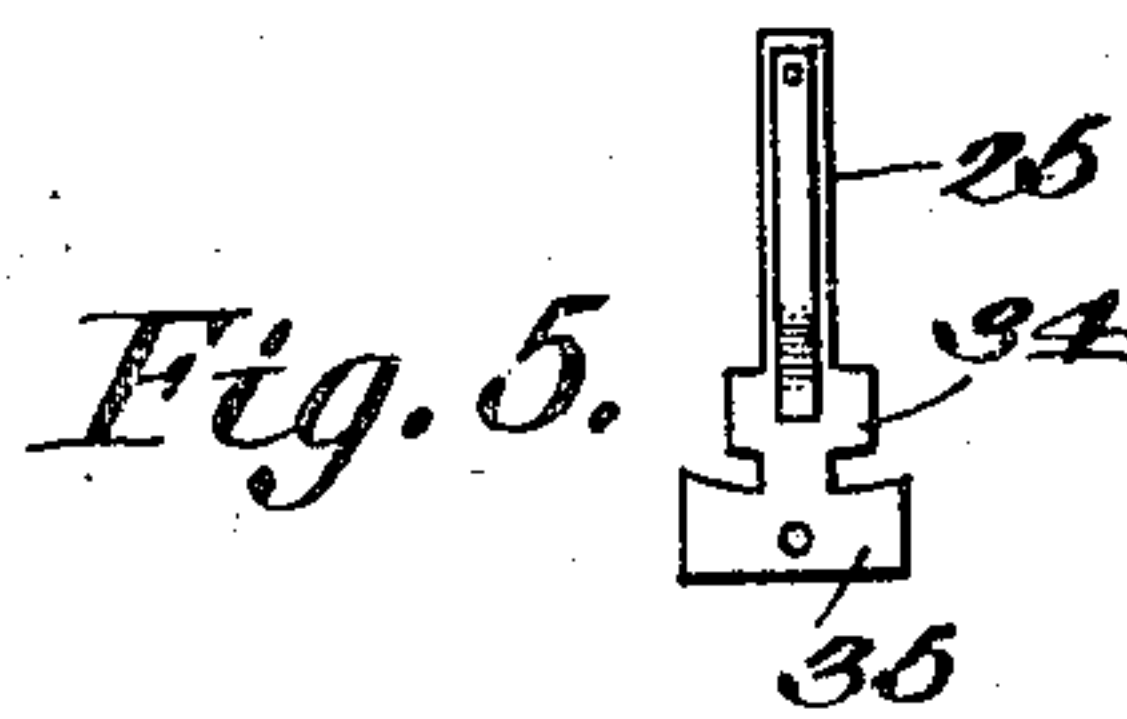
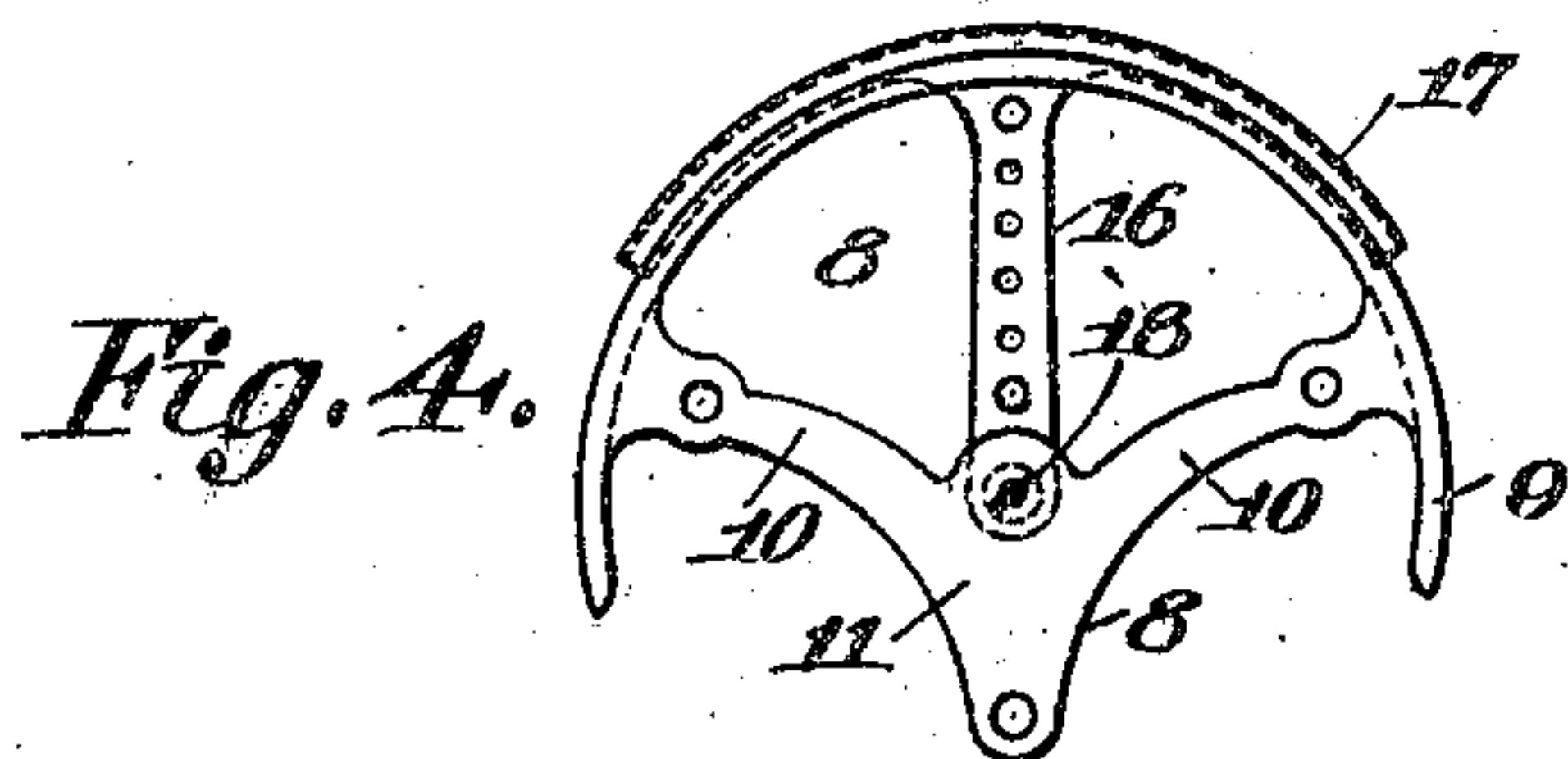


Fig. 1



Witnesses:

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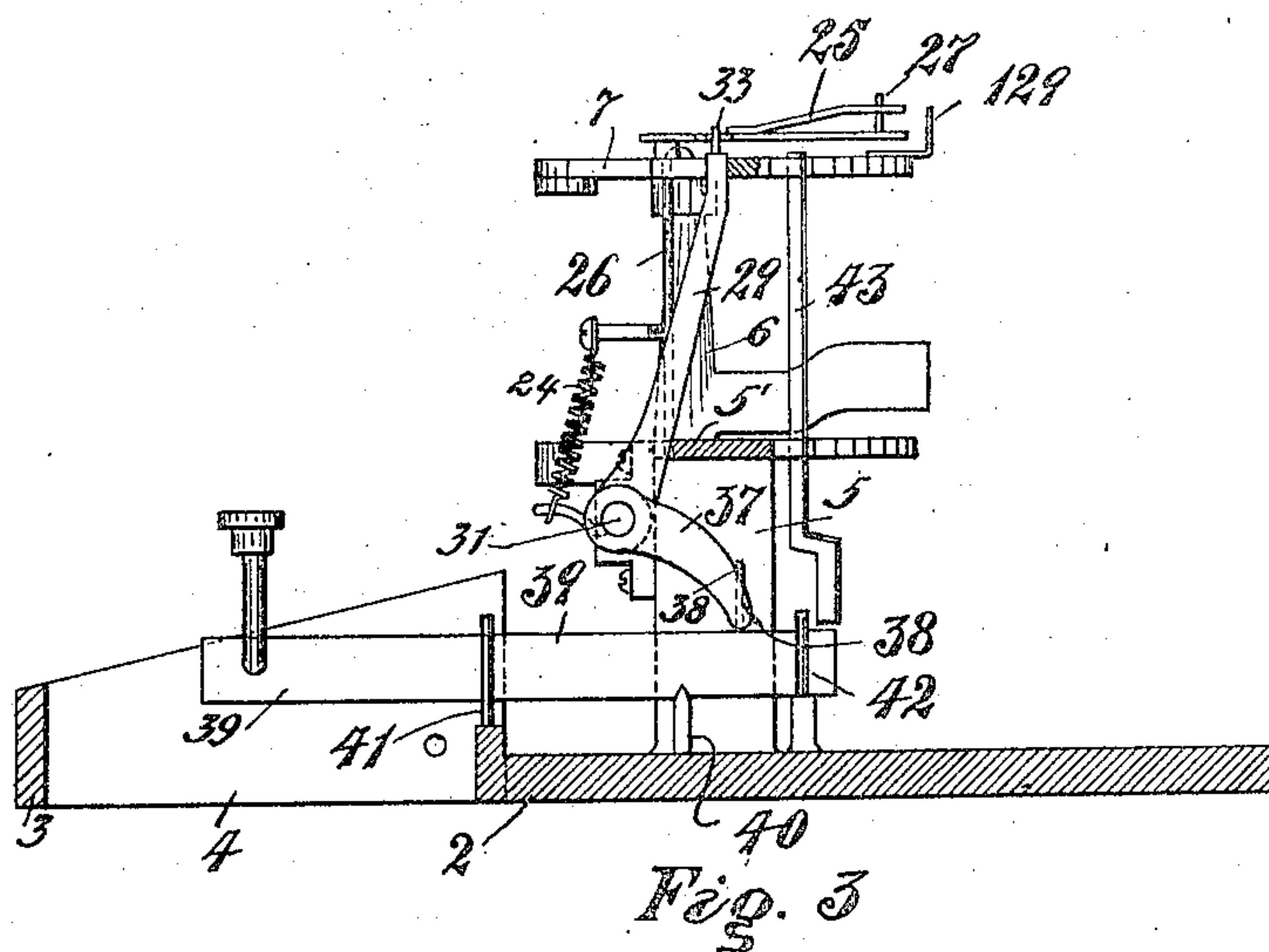
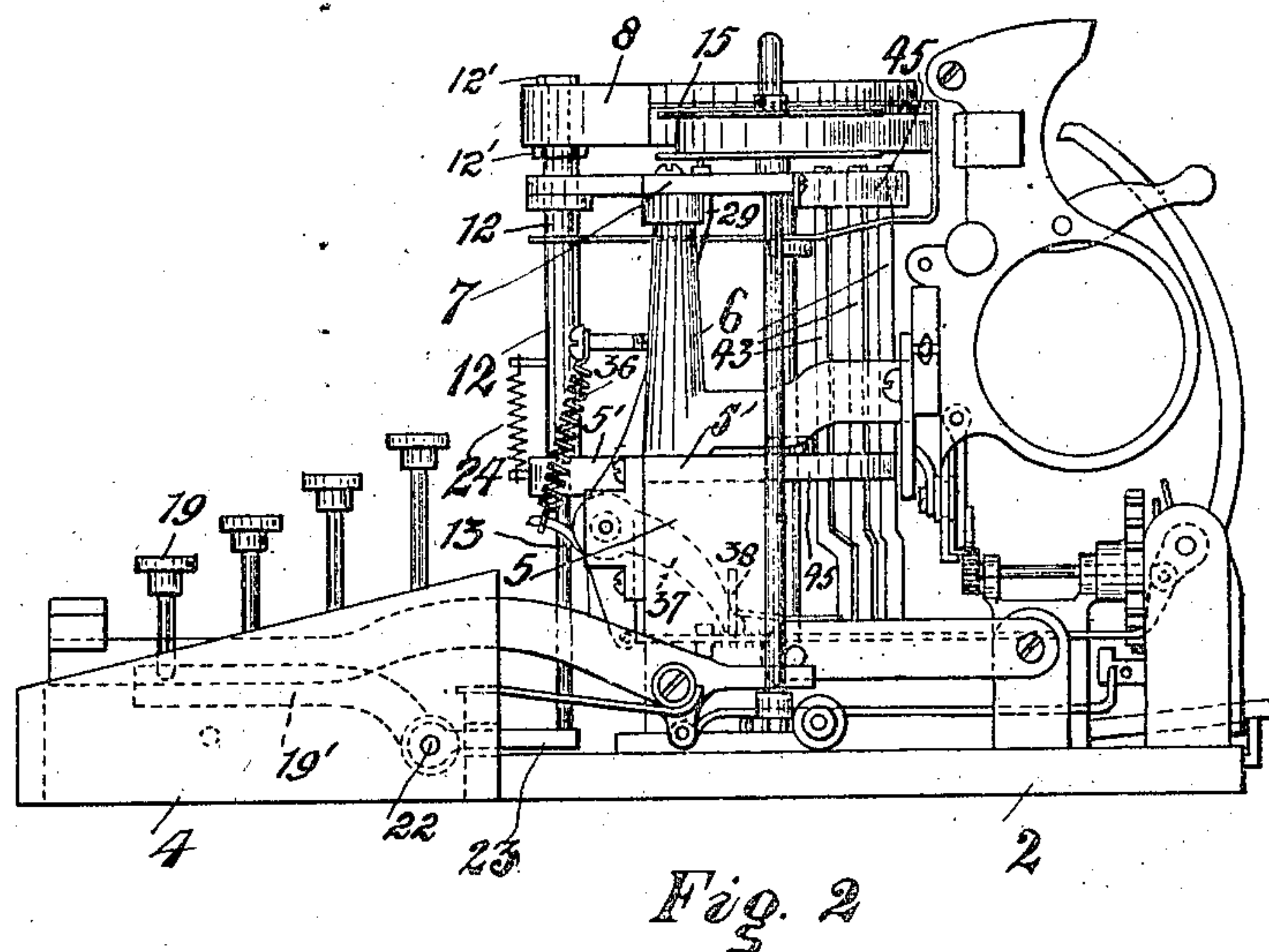
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2 SHEETS—SHEET 2.



Witnesses:
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Lillian Perry.

Inventors
Marshman W. Hazen and
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UNITED STATES PATENT OFFICE.

MARSHMAN W. HAZEN, OF NEW YORK, N. Y., AND RICHARD W. UHLIG, OF RUTHERFORD, NEW JERSEY; SAID UHLIG ASSIGNOR TO SAID HAZEN.

TYPE-WRITER.

No. 887,192.

Specification of Letters Patent.

Patented May 12, 1908.

Application filed January 25, 1905. Serial No. 243,028.

To all whom it may concern:

Be it known that we, MARSHMAN W. HAZEN and RICHARD W. UHLIG, citizens of the United States, and residents of New York, N. Y., and Rutherford, New Jersey, respectively, have invented a new and useful Improvement in Type-Writers, of which the following is a specification.

The present invention provides a type-writer construction which though simple and cheap is nevertheless adapted to the manufacture of a typewriting mechanism or machine of efficient and reliable operation.

The present typewriting machine relates to that class which employ a so-called type wheel or type carrier, selectively shiftable through various angles by the manipulation of the keys of the key board. The type carrier of the present machine is shown provided with a double row of types corresponding to upper and lower type fonts, means associated with the carrier enabling the latter to be manually shifted so that that row of types normally beyond the plane of the printing point may be brought into alinement therewith. Obviously, however, the type carrier may support a greater or less number of rows of type.

One of the most important features of the present invention relates to the construction, and mounting of this type carrier and of the mechanism combined therewith, whereby the selective angular movement and ultimate positioning of the carrier is accomplished.

This mechanism embraces stop devices which comprise means associated with the key levers and moved to a position by the operation of the latter, such that contact with the positioned stop mechanism is made adjacent to the type carrier; the illustrated machine includes a series of stops shiftable into an operative position lying in or immediately contiguous to the line passing through the printing point. Such a location for the positioned stops is advantageous in that it tends to prevent the vibration of the type carrier when the latter comes to rest with the selected type at the printing point, thus holding the type and consequently the type carrier firm and motionless in its printing position at the time of the impression. To the same end, that is, for the purpose of minimizing the effects of resilience in the parts and securing a maximum rigidity, the type carrier is designed to travel in a guide way provided for

it. The present construction is thus clearly distinguished from those in which the type carrier stop mechanism is on the opposite side of the type carrier axis, possessing advantages thereover in that the type carrier may be made longer and hence embrace a greater number of types in a row than is customarily present.

The present invention also includes an independent stationary anvil as contradistinguished from those constructions in which the type carrier guide performs such function.

Another feature of the invention relates to a simple form of supporting frame for maintaining the type carrier and its associated mechanism, as well as various other operative parts, in their assembled positions.

These various features together with others entering into the present invention are illustrated in the drawings accompanying the present specification in which

Figure 1 is a plan view of a typewriter embodying the present improvements. Fig. 2 is a side elevation thereof. Fig. 3 is a section on the plan of the line 3—3 in Fig. 1, various parts, however, being omitted. Fig. 4 is a detail plan view of the type carrier, its supporting arm, and the guide. Fig. 5 is a plan view of the flier arm.

Similar characters of reference designate corresponding parts in all figures.

A suitable supporting frame is provided for assembling and holding the various parts of the mechanism. In the form thereof here shown, it comprises a base piece 2 forwardly from which extends an open rectangular frame 3 defining the space for the key board (comprising the usual keys at the end of key levers.) Preferably the side pieces 4 of the frame 3 are substantially of the contour indicated in Fig. 2, the inclined upper edges corresponding to the inclined plane of the key system formation and constituting side guards for the key board. Of course, the frame with the various parts, standards, etc., thereof, may, when desired and convenient, be cast in one piece, or such parts may be separate and independent from each other and fastened together.

Erected upon the base plate 2 is a supplemental frame 5 comprising a cross plate 5' on which are erected posts 6 at whose upper ends is a plate 7.

A guide for the type carrier is designated

by 8, the same comprising an arc-shaped portion 9 connected by arms 10 with a central portion 11 from which latter extends a supporting rod 12, preferably connected with the guide by a pair of nuts 12', 12' whereby the position of the guide on the rod may be adjusted and the parts fixed in their adjusted position. This rod 12 is slidably mounted in an opening in an extension of the upper plate 7, the lower portion 13 of the shaft being somewhat smaller in diameter than the upper portion and forming a shoulder resting upon the edge of an opening in the supplementary frame plate 5', through which said portion 13 is slidable. Guide pins 14, 14 project upwardly from the upper plate 7 and register with openings in the arms 10, 10 of the type carrier guide. Extending lengthwise of the arc-shaped portion 9 of the said guide is a guide slot 15 (the guide may be in two parts to form such slot) along which arm 16 is adapted to travel. Arm 16 together with an axially extending portion at its free end (constituting the type carrier proper) are preferably made in one integral piece designated by 17. Said axially extending portion, or type carrier proper is here made in sector like form and its arm 16 is pivotally mounted at 18 upon portion 8 of the guide so as to turn about an axis coinciding with the axis of the arc shaped portion of the guide. The guide slot in the latter serves to define the plane of the angular travel of the carrier and the walls of the slot prevent the displacement of the carrier sector axially of its axis of movement.

The type carrier 17, may be of such dimensions as to support two rows of types, that normally lying in the plane of the printing point ordinarily corresponding to the lower font, while immediately below the lower font types there may be a row of upper font types brought at will into register with the printing point as the result of the upper movement of the carrier guide and, in consequence the carrier mounted thereon. This shifting is accomplished through the actuation of a shift key such as 19, (preferably one at each side of the key board,) whose arm or lever 19' is connected to a rock shaft 22 journaled in the sides of the key board frame and having a rearwardly extending arm 23 whose free end coöperates with the supporting shaft of the type carrier guide in a manner such that on the depression of the shift key, the stepped or shoulder-forming shaft 12, 13, and the guide (with the supported carrier) is raised, the guide during the movement sliding on the pins 14, 14. A spring 24 held under tension between a pin on shaft 12 and a pin on the machine frame returns the parts to the position indicated in Fig. 2, on the release of the key.

Referring now to means for selectively shifting the type carrier, 25 indicates a flier

arm located beneath the carrier guide and whose shaft is suitably journaled in parts of the machine framing substantially coincident with the axis about which the carrier turns. This flier arm carries a pin 27 which enters an opening in the arm of the type carrier, causing the latter to move in unison with the movements of the arm. The arm may be swung toward the right or toward the left from its central position (in which central position in alinement with the type anvil it is indicated in Fig. 1) through the instrumentality of operating levers 29 and 30. These levers 29 and 30 are secured to respective rock shafts 31 and 32, journaled in proper bearings which are secured to the supplemental frame 5 and each carries at its upper end a pin 33. When the flier arm is in its central position, these pins lie against the opposite sides of an enlarged portion 34 of the flier arm 25 at points somewhat forward of the flier arm axis, thus tending to position the arm in its correct central position. Upon the backward movement of either of the said operating levers, (effected by means which will be presently described,) the pin 33 thereon is brought into contact with the wall or edge of a laterally elongated portion 35 of the flier arm and throws the latter to the right or the left, as the case may be, positioning the selected type on the type carrier at the printing point. Between the portions 34 and 35 of the arm at each side is an inwardly extending notch, substantially as indicated, to allow the pins on the operating levers freedom of movement. The rock shafts 31 and 32 are returned after actuation and release, by suitable springs 36, interposed between radial pins on the respective shafts and portions of the machine frame; this backward motion of the rock shaft (through the contact of the pin on the operating lever extending therefrom with the edge of the portion 34 of the flier arm) returning the flier arm to its central position.

It is evident that the flier arm must be swung through different angles in order to bring selected types in the row thereof on the type carrier consecutively to the printing point. For this purpose each rock shaft 31 and 32 is provided with a corresponding arm 37 which carries at its free end a cross bar 38 lying over the key levers, the cross bar 38 for the actuation of the shaft 31 extending laterally above the key levers to the right of the printing point while the cross bar for the actuation of the rock shaft 32 is similarly positioned with respect to the key levers at the left of the printing point. It will be understood, therefore, that the cross bar 38 at one side of the machine is a substantial duplicate of that at the opposite side thereof, and hence need not be specifically illustrated.

It should be stated that the key levers (designated without discrimination by 39)

are fulcrumed intermediate their ends and suitably mounted to confine them to a movement in the planes of the respective levers.

In the construction here illustrated, each of the key levers has its lower edge notched, such notch fitting over a knife edge or fulcrum bar 40 (one or more) secured to the base plate of the supporting frame, and the several key levers being located in the spaces between parallel guide pins. Two series of such pins are shown, one 41 on one side of the fulcrum bar and another 42 on the other side thereof these pins being close together to prevent the vibration of the levers.

One of the important features of the invention relates to the stop mechanism construction and the positions which the stops assume in controlling the position of the type carrier when turned by the depression of a key. In this instance the respective stops, in the form of flat bars, are each adapted to be shifted to its stop position by the depression of a key, there being a stop bar 43 corresponding to each key or key lever. The series of stop bars are mounted to move vertically in appropriate slots or guide ways in plates 7 and 5', these guide ways being disposed in an arc just within and below the portion 9 of the type carrier guide. The radius of this arc is such that, when a stop is elevated and its upper end thrown across the path of the flapper arm 25, contact of the latter will be made with the stop adjacent to the pin 27 of the arm, that is very close to the type carrier. Vibration of the arm and the carrier in consequence of the arm striking the projected stop is thus minimized and the depressed key holds the arm tightly against the stop. The stop bars are of preferably flat form, since such forms answer every purpose and guideways therefor are cheaply made, slotting being cheaper than drilling.

Motion is transmitted from the inner end of each key lever to its corresponding stop bar by the impingement of the upper edge of the former against the lower end of the bar, it being observed that the lower end portions of the stop bars as well as the inner ends of the key levers are of such conformation, or are so bent, as to cause the proper cooperation of each key lever with its associated stop bar. Keepers 45, 45 are secured in position to retain the stop bars in their guide slots and confine their movement to a longitudinal one.

An anvil 129 independent of the type carrier guide is located just behind the type carrier and in the plane of movement of the type hammer, the anvil being fixedly secured to the upper plate of the machine frame.

It should be stated that while the arm 16 of the type carrier is closely, though, slidably, fitted to the guide slot in the guide, the axially extending portion of the type carrier is

spaced at a sufficient distance from the outer or convex face of the guide as to permit the location of the anvil between such face and the type carrier proper. This is indicated in Fig. 4 in which the dotted curved line between the full lines representing the outer faces of the guide, and the type carrier proper corresponds to the inner or concave face of the latter. The anvil is rigidly affixed to plate 7 comprised in the supporting frame of the machine, the outer end of the anvil being upright, see Fig. 3, and adapted to take the position aforesaid in the plane of vibration of the type-hammer and immediately behind the types on the type carrier which have been brought by the operation of the machine successively into position for printing.

It will be noticed that the key lever system comprises substantially parallelly disposed key levers, the fulcrum bar or bars of the key levers being straight bars and the inner ends of the key levers being bent to properly cooperate with the lower ends of the stop bars, as aforesaid.

Having described our invention, we claim:

1. The combination of an angularly shiftable type carrier, a supporting arm extending therefrom, a guide provided with a guide slot for the supporting arm and having guide walls on opposite sides of the arm immediately contiguous to the type carrier, and an anvil independent of said guide and located between it and the type carrier.

2. The combination of an angularly shiftable type carrier, a supporting arm extending therefrom, a guide shiftable to bring a selected row of types into line with the printing point, said guide being provided with a guide slot for the supporting arm having guide walls on opposite sides of the arm immediately contiguous to the type carrier, and a non-shiftable anvil.

3. The combination of an angularly shiftable type carrier, a supporting arm extending therefrom, a guide provided with a guide slot along which said arm may travel and which is shiftable to bring a selected row of types into line with the printing point, guide pins determining the shifting movement of the guide, and a non-shiftable anvil interposed between said type carrier and said guide.

4. The combination of an angularly shiftable type carrier, a supporting arm integral therewith, a guide provided with a guide slot along which said arm may travel and which is shiftable to bring a selected row of types into line with the printing point, a shift rod to which the guide is secured, means for adjusting the position of the guide on the shift rod and stop pins selectively shiftable into an operative position between the axis of the type carrier movement and the type carrier and immediately contiguous to the type carrier.

5. The combination of a shiftable type

carrier, a pivoted supporting arm extending therefrom, a guide provided with a guide slot along which said arm may travel; an anvil independent of said guide, a series of stop
5 pins shiftable into an operative position immediately contiguous to the type carrier, and selective mechanism for selectively shifting the type carrier, and selectively operating the stop pins.

10 6. The combination of an angularly shiftable type carrier, a supporting arm extending therefrom, stop pins interposed between the axis of the type carrier movement and the type carrier and which are shiftable into an
15 operative position immediately contiguous to the type carrier, and selective mechanism for selectively operating the type carrier and the stop pins.

20 7. The combination of an arc-shaped type carrier, a pivotally mounted arm extending

therefrom, a guide provided with a guide slot along which the arm is adapted to travel and having guide walls on opposite sides of the arm, a shift rod to which the guide is adjust-
ably secured, a non-shiftable anvil, a flier 25 arm engaging with the arm extending from the type carrier, flier arm actuating mechanism, stop mechanism comprising a series of actuatable stops each adapted when set to engage with the flier arm contiguous to the
30 extremity of its free end, and selective mechanism.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

MARSHMAN W. HAZEN.
RICHARD W. UHLIG.

Witnesses:

W. F. VALENTINE,
M. J. BEVANS.