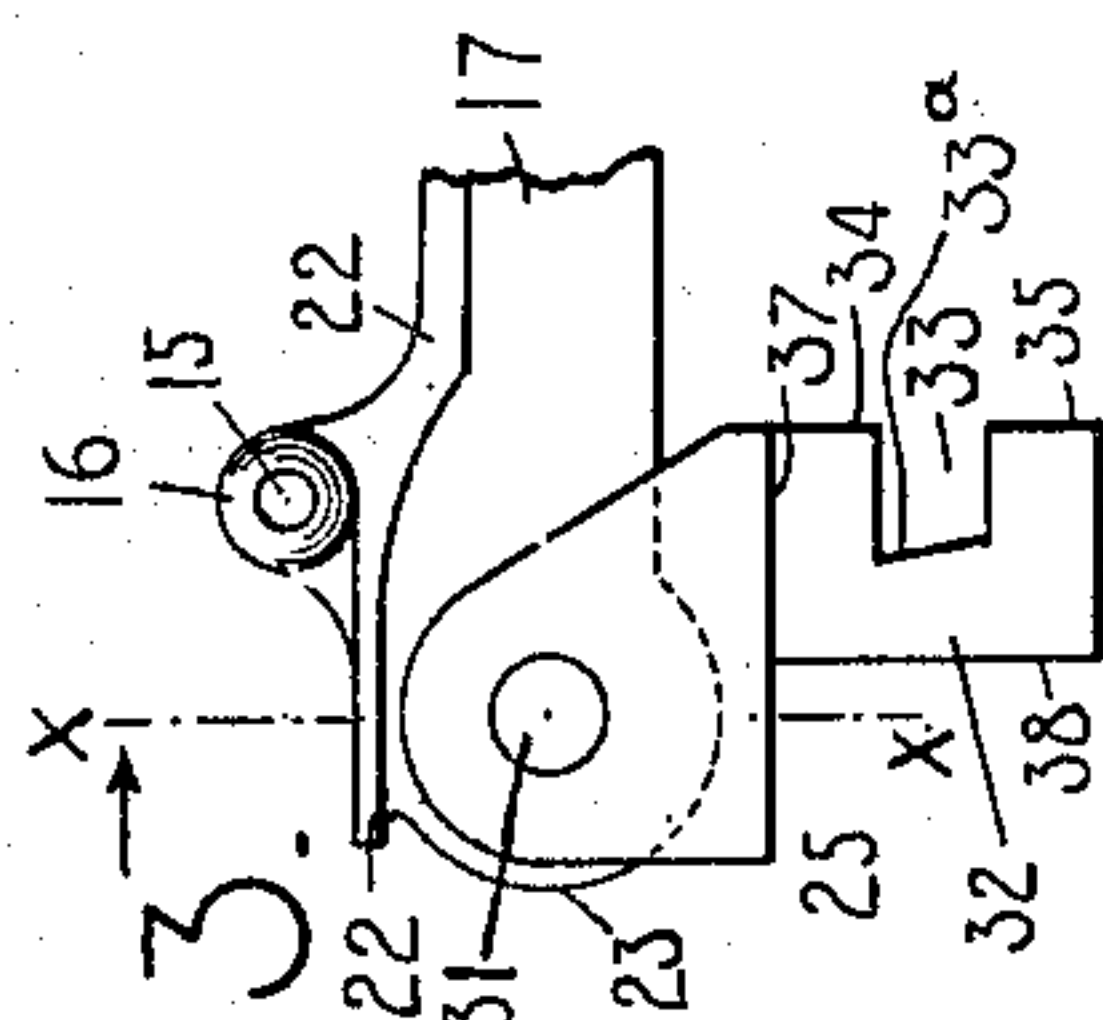


No. 860,225.

PATENTED JULY 16, 1907.

H. W. MERRITT.
TYPE WRITING MACHINE.
APPLICATION FILED JAN. 7, 1904.

2 SHEETS—SHEET 1.



WITNESSES:

S. Nielsen

Charles Smith

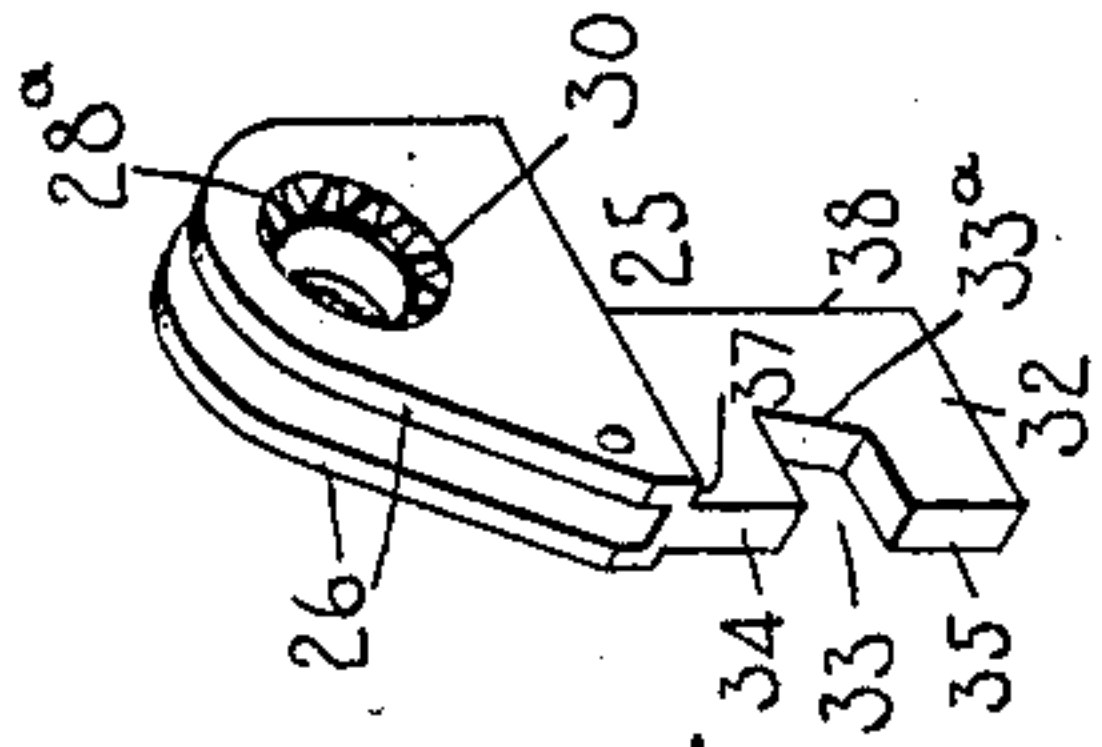


FIG. 5.

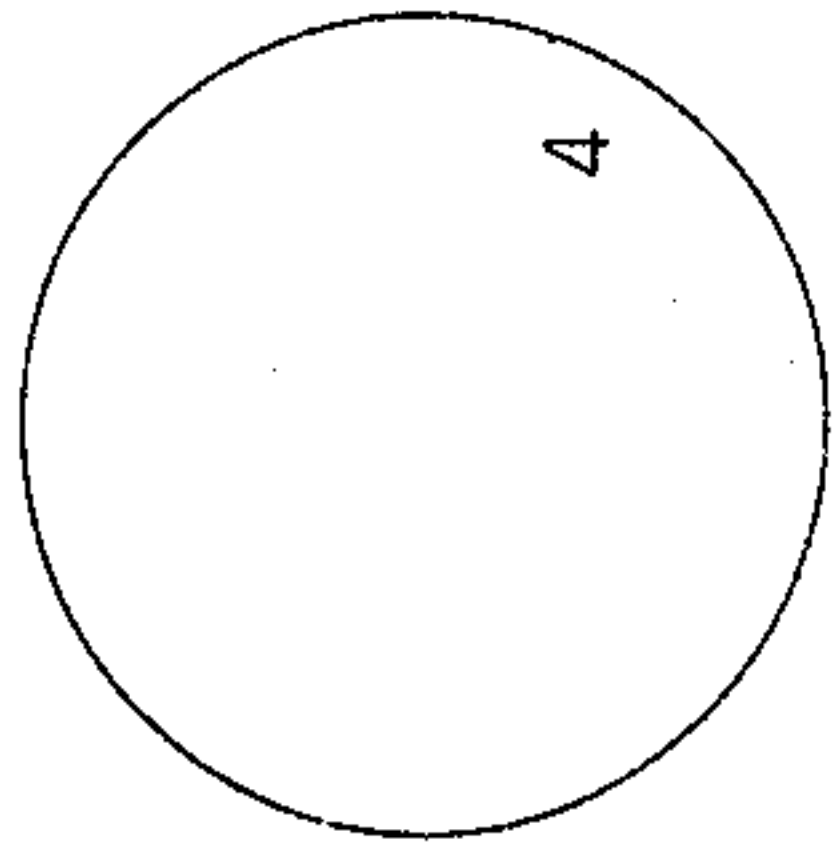


FIG. 4. FIG. 1

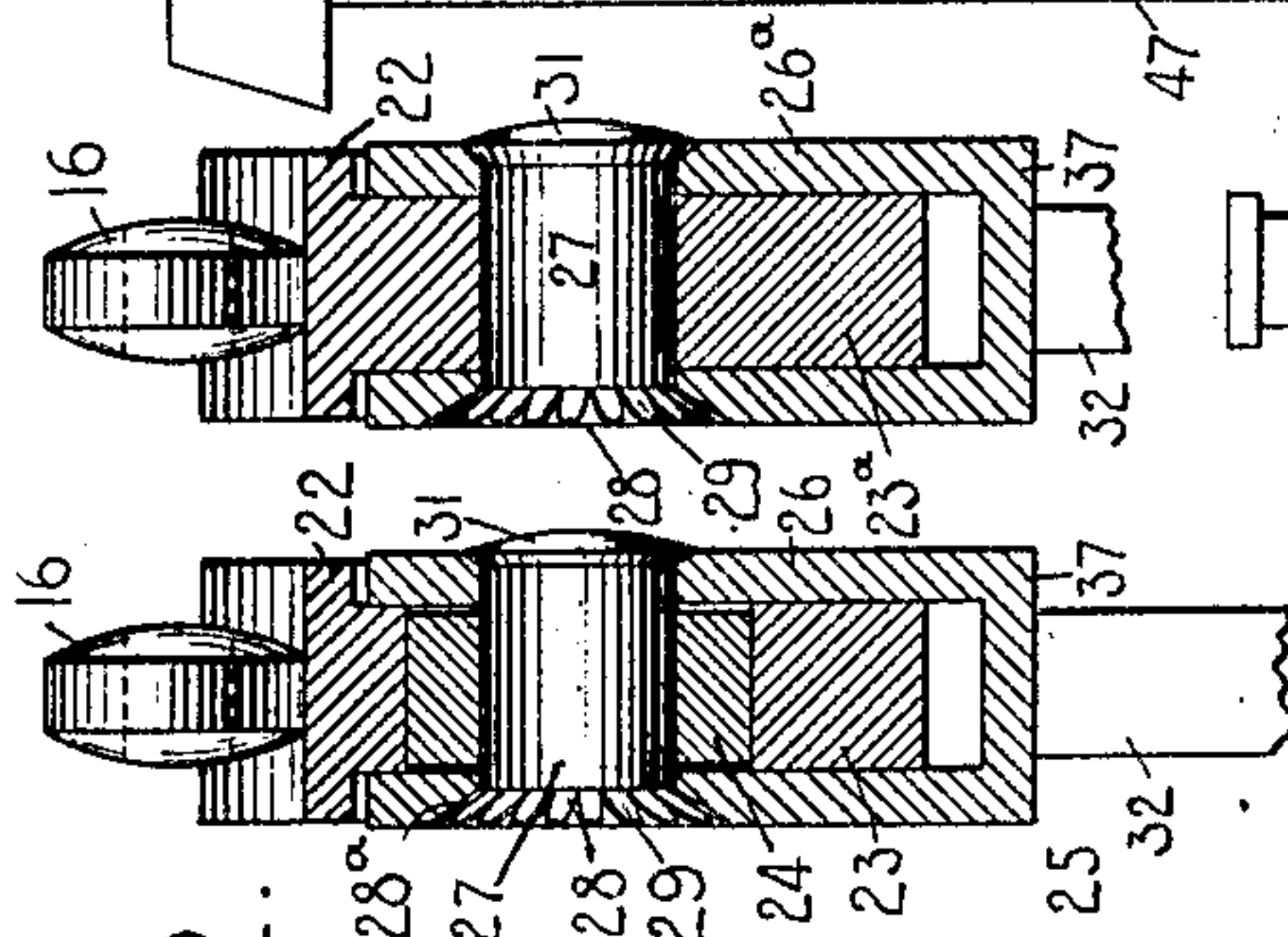
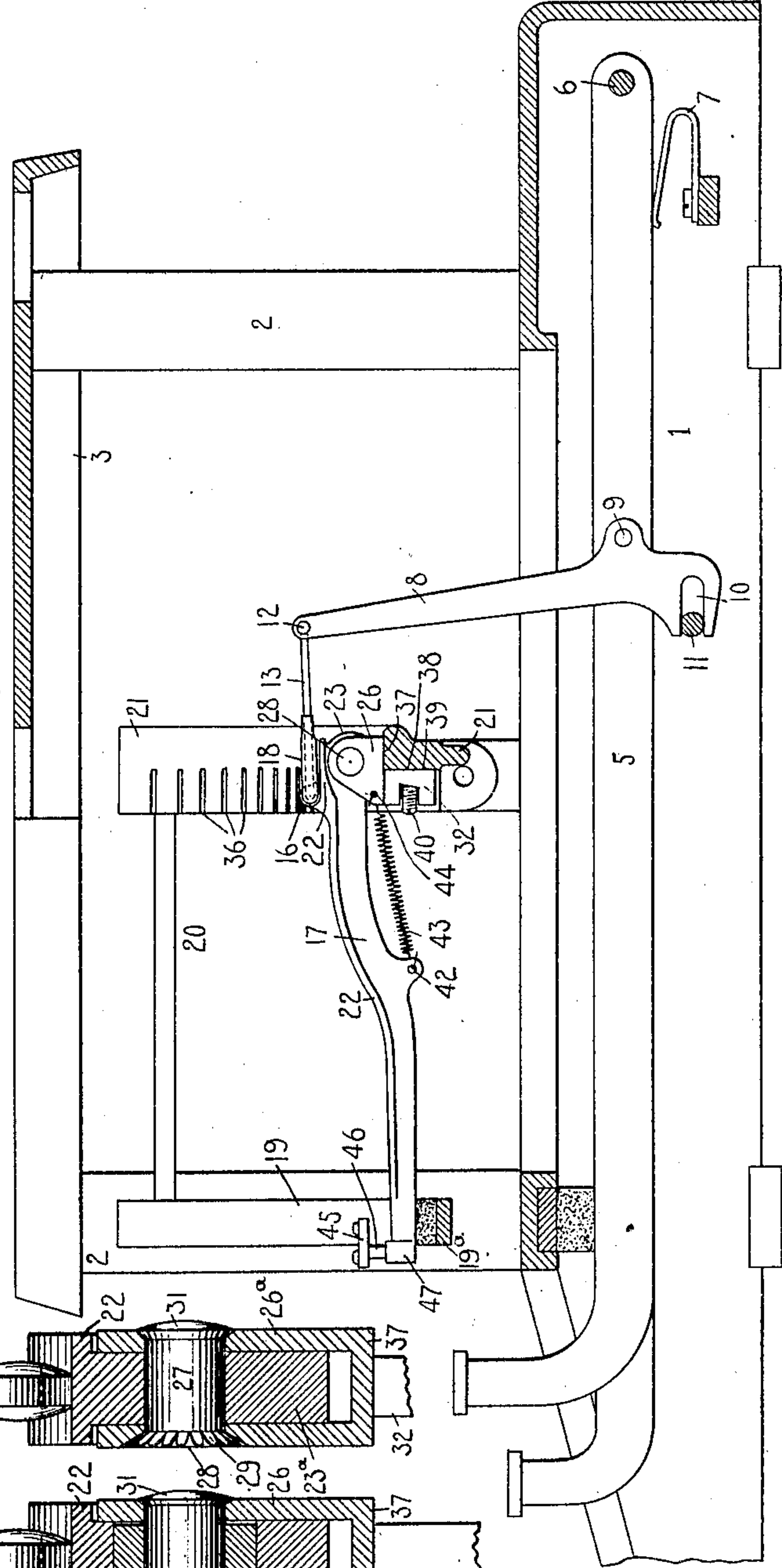


FIG. 2.



INVENTOR:

Henry W. Merritt

By Jacob Felbel

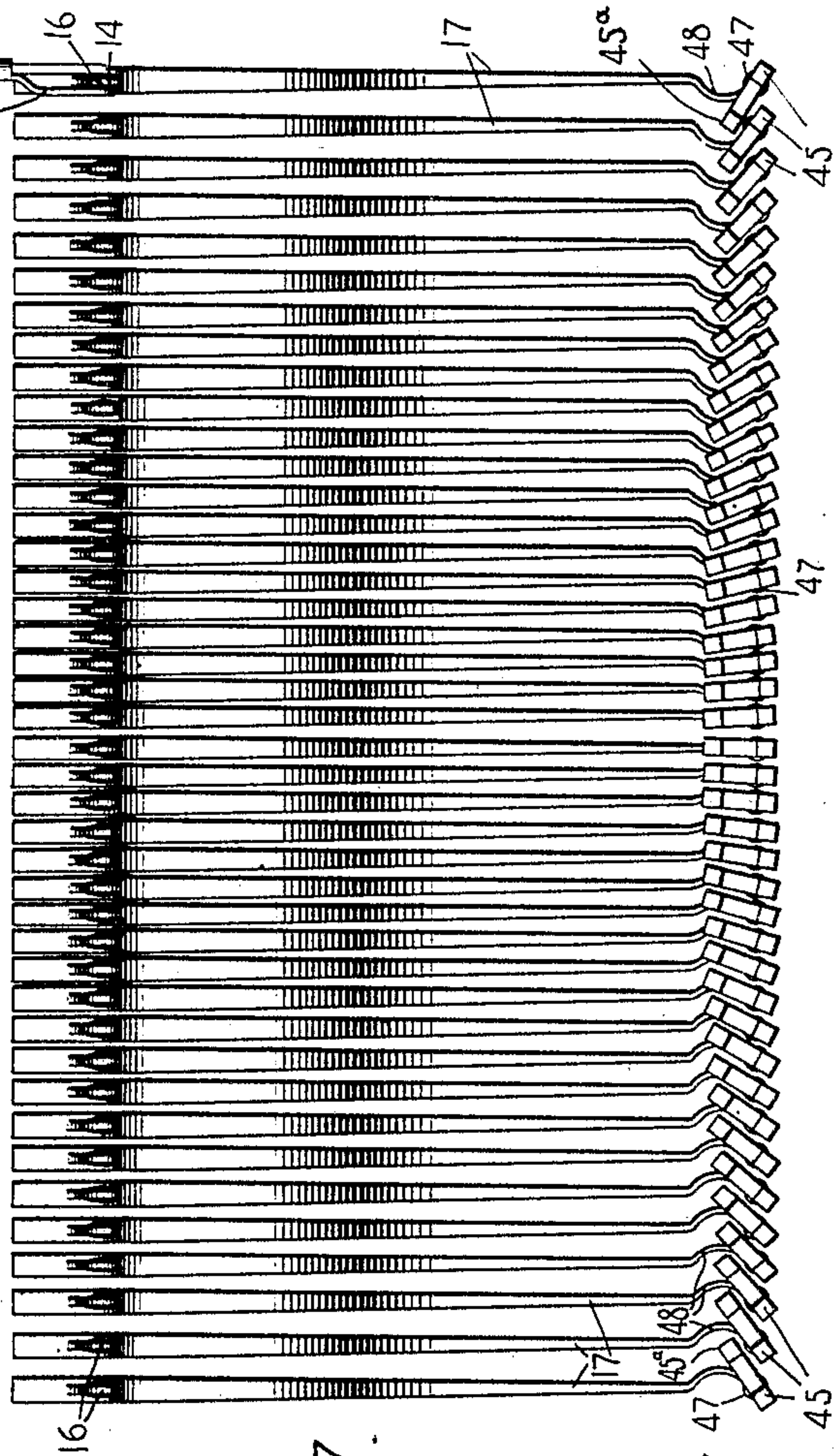
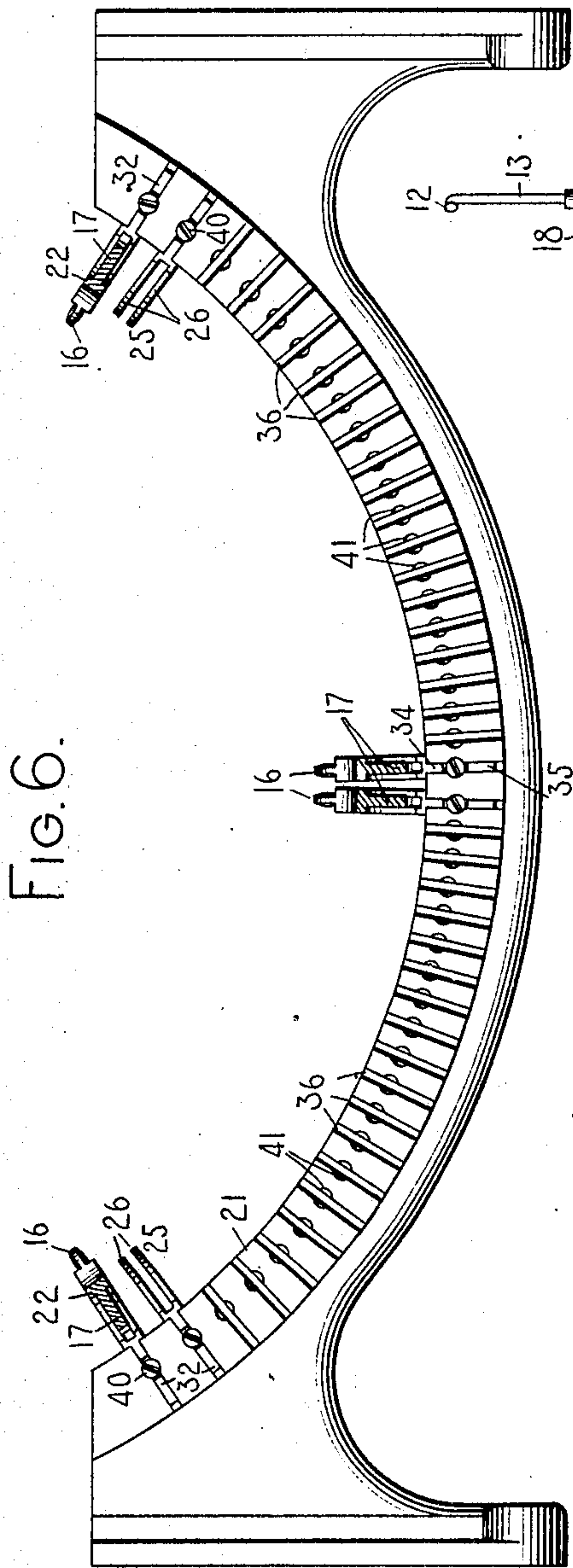
HIS ATTORNEY

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2 SHEETS—SHEET 2.



WITNESSES.
S. Nielsen
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INVENTOR.
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By *Jacob Felbel*
HIS ATTORNEY

UNITED STATES PATENT OFFICE.

HENRY W. MERRITT, OF SYRACUSE, NEW YORK, ASSIGNOR TO THE MONARCH TYPEWRITER COMPANY, OF SYRACUSE, NEW YORK, A CORPORATION OF NEW YORK.

TYPE-WRITING MACHINE.

No. 860,225.

Specification of Letters Patent.

Patented July 16, 1907.

Application filed January 7, 1904. Serial No. 188,080.

To all whom it may concern:

Be it known that I, HENRY W. MERRITT, a citizen of the United States, and a resident of Syracuse, in the county of Onondaga and State of New York, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

My invention relates to typewriting machines and more particularly to the construction and arrangement of type bars and hangers therefor.

In front strike typewriting machines the pivotal bearings for the type bars are ordinarily arranged below the platen and in a vertical plane substantially coincident with the front face of the platen so that particles of sand, grit, rubber, paper, etc., which drop from the paper at the front face of the platen when an operator is making an erasure, fall upon and in the pivotal bearings of the type bars and may clog the same and render the type action sluggish in operation.

One object of my invention is to overcome the above and other difficulties heretofore encountered and to provide a type bar and hanger construction wherein the bearing or joint between the type bar and hanger is protected against the admission of dust or grit thereto.

A further object of my invention is to provide a simple and efficient type-bar-and-hanger construction in which the type bars are properly guided and prevented from lateral play during the movements thereof; in which the bearing is easy and smooth, thus reducing the wear upon the parts to the minimum; and a construction in which the parts may be readily assembled.

A still further object of my invention is to provide a construction which affords a close arrangement of the type bars without liability of conflict between the bars at or in the vicinity of the basket or rest in the operation of the machine.

A still further object of the invention is to provide an improved arrangement of restoring springs for the type bars.

To the above and other ends, which will hereinafter appear, my invention consists in the features of construction, arrangements of parts and combinations of devices to be hereinafter described and particularly pointed out in the appended claims.

In the accompanying drawings, wherein like reference characters designate like parts in the various views, Figure 1 is a vertical front to rear sectional view of sufficient number of parts of a front strike typewriting machine to illustrate my invention. Fig. 2 is an enlarged fragmentary detail vertical sectional view of one form of type bar and hanger, the section

being taken on the line $x-x$ of Fig. 3 and looking in the direction of the arrow at said line. Fig. 3 is a fragmentary detail side view of the type bar and hanger illustrated in Fig. 2. Fig. 4 is a detail vertical sectional view, corresponding to that illustrated in Fig. 2, of a modified form of construction of type bar and hanger. Fig. 5 is a detail view of the hanger employed with both type bar constructions. Fig. 6 is a detail front view, partly in section, showing a type bar segment with some of the hangers and type bars mounted in place. Fig. 7 is a diagrammatic plan view showing the construction and arrangement of the type bars.

The frame of the machine comprises a base 1, corner posts 2 and top plate 3, which latter supports a carriage (not shown) that carries a platen 4, diagrammatically illustrated in Fig. 1. Key levers 5 are pivoted at 6 in the base of the machine and are provided with restoring springs 7. Each key lever has a sub-lever 8 which is pivoted thereto at 9, and the lower end of each sub-lever is slotted at 10 for cooperation with a fixed fulcrum bar 11 that extends beneath the key levers from side to side of the machine. The upper end of each sub-lever is pivoted to the bent end 12 of a link 13 formed of a continuous wire. The forward end of each link is bent, as indicated at 14 in Fig. 6, to form a pivot which enters an opening 15 in an ear 16 of a type bar 17. A leaf spring 18 has one end bent around and secured to the link 13 and bears at its free end against the forward end of the bent portion 14 of the link so that the link may be readily connected to or disconnected from the type bar. The type bars 17 rest at their forward ends upon a pad 19 held by a segmental support 19^a secured to arms 20 which project forwardly from a type bar segment 21.

Each type bar is substantially T-shaped in cross-section so as to provide a projecting web or flange 22 that extends laterally outwardly in opposite directions from the body of the type bar and preferably throughout, or substantially throughout, the length of the bar, for purposes which will hereinafter appear, though certain of the functions for which these ledges or flanges are provided may be attained if said laterally projecting portions extend forwardly only a short distance from the heel or pivotal end of the type bar.

Each type bar is formed or provided with a hardened eye portion 23 which, as illustrated in Fig. 2, receives a hardened metal bushing 24 that is slightly thinner than the eye of the type bar. This bushing is loosely seated in the eye so that the type bar may turn freely thereon.

A hardened type bar hanger 25 has a bifurcated portion 26 that receives the eye or hub of the type bar. The bifurcated portion is perforated for the reception

of a soft metal pin or rivet 27 that passes through one of the openings in the hanger and is secured with a drive fit in the bushing 24 and then projects through the other opening in the hanger. The hardened bushing is thus
 5 connected by a frictional connection to the pin or rivet. The rivet has a head 28 which is corrugated or roughened at 29 and seated in a counter-sunk portion 28^a in one cheek 26, that is likewise corrugated or roughened at 30, whereas the opposite cheek of the type bar hanger
 10 is slightly counter-sunk for the reception of the opposite head 31 of the pin or rivet.

In assembling the parts the hardened eye 23 of the type bar, with the hardened bushing seated in place therein, is inserted in the bifurcated portion of the associated hanger and the soft metal pin 27 is projected
 15 through the bifurcated portion and through the bushing in the type bar, as illustrated in Fig. 2. The end of the soft metal pin opposite the head 28 is then spun down in order to form the head 31 thereon to unite the
 20 type bar and hanger. The head 28 of the rivet is preferably first seated so as to interlock the projections and depressions or corrugations 29 and 30, which together operate to prevent a turning movement of the rivet relatively to the bifurcated portion of the hanger.
 25 As heretofore pointed out, the bushing is fixed to the rivet, and the rivet being fixed in the manner described to the hanger, no wear can take place on the rivet as the eye of the type bar will turn on the periphery of the bushing, and these parts may be hardened, so that
 30 they will resist wear indefinitely. Little or no wear will take place between the faces of the eye or hub 23 of the type bar and the inner walls of the bifurcated portion of the hanger; but if any wear should occur it may be taken up or compensated for by a further
 35 spinning or upsetting of the head 31 of the rivet. The cheeks of the hanger guide and steady the type bar and help preserve the alinement of the writing.

Each hanger is provided with a depending portion 32 which is apertured at 33 to form upper and lower
 40 jaws 34 and 35 respectively. The depending stem of each hanger is seated in a slot 36 in the type bar segment 21. When the hanger is in place, the shoulder 37, formed at the junction between the bifurcated portion and the depending stem, bears upon the upper face of
 45 the segment and supports the hanger in place, whereas the rear face 38 of the stem of the hanger is adapted to bear against the rear wall 39 of the slot in which it is received. A screw 40 extending fore and aft of the machine is received within a threaded opening 41 in
 50 the segment and projects into the aperture or unthreaded opening 33 in the associated hanger and bears at its rear end against the rear inclined wall or cam face 33^a, to force the hanger to its seat and hold the hanger firmly in place, as indicated in Fig. 1. There is sufficient
 55 space between the screw 40 and the jaws 34 and 35 to afford a slight radial movement of the hanger so that a tightening of the screw 40 will properly position the hanger and secure it in position. It will be seen that the shoulder 37 and edge 38 of each hanger are at substantially
 60 right angles to each other and that the rear wall 39 of each slot 36 and the top of the segment are likewise at substantially right angles to each other and that the shoulders 37, edges 38, walls 39 and top plate of the segment cooperate to properly position the hangers when they are in the slots. Thus the shoulders 37

and edges 38 on the hangers will be brought into co-operation respectively with the top side of the segment and with the walls 39 when the screws 40 are tightened up. A hanger may be detached by withdrawing a screw 40 to a point where the rear end thereof clears the
 70 lower jaw 35 of the hanger.

To each type bar is connected at 42 the forward end of a contractile restoring spring 43, the rear end of which is connected at 44 to the hanger, so that each
 75 hanger, its associated type bar and the restoring spring can be mounted in place or removed together from the machine as a unit, which is a great desideratum. It will be seen that each restoring spring extends in the general direction of the length of its associated type
 80 bar and is located beneath the same in the normal position of the bar; that each restoring spring is connected at its rear end to a relatively fixed point below and forward of but adjacent to the pivot of its associated type bar and to one of the jaws of the associated
 85 hanger, and at its forward end said spring is connected to a lug at the bottom edge and about midway of the length of the type bar and so that the spring swings with its associated type bar and in the plane of movement thereof and gradually expands as the type bar
 90 approaches the printing position.

The construction shown in Fig. 4 is similar to that already described, excepting that the bushing 24 is omitted and the hardened eye 23^a of the type bar has a direct bearing on the rivet or pivot pin which if desired, may be case-hardened. In accordance with
 95 this construction it is necessary to leave at least one end portion of the rivet sufficiently soft to upset or spin it over in order to form a head such as 31 thereon after the parts are assembled. In the construction shown in Fig. 2, however, the bushing 24 and the eye
 100 of the type bar may be hardened throughout and the parts may be readily and efficiently united by means of the soft rivet which nevertheless does not take the wear of the parts.

It will be observed that the pivots of the segmental
 105 series of type bars are arranged in a vertical plane substantially coincident with the front face of the platen and that each type bar is substantially T-shaped in cross section so as to provide overhanging flanges or
 110 portions 22 that project laterally from the middle or body of the type bar to the outer side walls of the hanger and lie between the hanger and the platen and cover the joint between the type bar and hanger and so that any grit or particles which drop from the front
 115 face of the platen, when the operator is making an erasure on the paper, will be received on the upper portion of the bar and may be brushed off therefrom or discharged to the rear of the segment during the upward and rearward printing movements of the type
 120 bars, thus protecting the bearings of the type bars. The flanges 22 preferably extend throughout, or substantially throughout, the length of the bar so as to form a stiffening or strengthening rib or web for the type bar, in addition to a dust cover for the bearing.

From an examination of Figs. 6 and 7 it will be observed that the slots 36 in the segment are arranged at
 125 gradually increasing distances apart from the center to the sides of the segment. This is in order to afford gradually increasing spacing between the type bars from the center to the sides of the system, it being un-
 130

derstood that the type bars at the sides of the system should be spaced at greater distances apart than at the center in order to provide sufficient clearance for the type blocks 45, which have a plurality of types thereon and gradually change or increase in their angular relation to their respective bars from the center to the sides of the system. Each type block 45 has a downwardly extending and slightly tapering stem 46 which enters a corresponding socket 47 in the end of the type bar.

10 From an examination of Fig. 7 it will be observed that the type bars are bent, curved or recessed at 48 near their type bearing portions and that the curved or recessed portions are oppositely disposed at opposite sides of the segmentally arranged series of type bars or as the type bars extend from the center to the sides of the system, and that the recesses face outwardly. Furthermore, it will be seen that while the offset or overhanging portion 45^a of each type block 45 at the sides of the system enters or extends to a point within the bend or recess in the next adjacent bar, in the movements of the side bars to and from the printing point the type blocks or bars will not clash or interfere. This construction enables the use of a greater number of type bars in a given sized segment and notwithstanding the close arrangement of the bars and the fact that the type blocks at the sides of the segment each cuts or overlaps the plane of the body portion of its adjacent bar ample space is provided and there is no collision of bars. Without this construction and arrangement, greater spacing between the bars would be required and hence fewer bars could be used within a given arc.

The curved or bent portions of the bars may be variously arranged in the different bars; thus, certain of the center bars, say ten, may be devoid of the curved or bent portion and the remaining bars be gradually or progressively curved to greater extents as the sides of the system are approached, or the curved or bent portions may be of the same size throughout, the extent of the curve in each bar, however, being sufficient to provide a clearance for the offset block of the adjacent type bar.

Each type bar 17 is preferably forged by a series of operations into the shape and construction shown, and holes are then drilled in the type bearing end of the bar for the reception of the stem or shank of the type block, in the ear 16 for the connecting link, and in the hub or heel to form the journal bearing of the type bar.

50 The eyes or hubs of the type bars are made of an exact size to fit closely within the bifurcated hangers and in riveting the parts together, care is observed not to cause undue pressure between the side bearing portions of the type bar and the hanger. It is for this reason that the rivet is spun over at the end 31 instead of hammered down. It has been found in practice that in hammering there is a liability of causing the cheek plates of the hanger to become set against the eye of the type bar and hence to bind, but by heading the rivet at 31 by a spinning operation with a special tool the pressure on the cheek plates does not cause them to set or bind against the type bar.

Various changes may be made without departing from the spirit of my invention and certain features thereof may be employed without others. Thus, for

instance, it is immaterial from certain aspects of my invention whether or not the dust proof feature of the construction be employed, and from certain other aspects of my invention the dust proof feature of the invention may be employed with a joint of any other suitable construction. Then again, the recesses 48 may be employed with any style of bar, type block or type bar bearing, so long as the recesses cooperate with the type for the purposes specified.

From the foregoing and from the drawings it will be observed that the hangers have plate-like shanks which fit in radial slots in the segment; that the upper portions of the hangers are forked to provide cheek plates which embrace the sides of the type bars and serve to steady and guide the same and preserve the alinement of the writing, the said cheek plates having a close fit to the sides of the type bars without, however, binding upon the same and interfering with the freely swinging movements thereof; that the type bar is T-shaped in cross section for substantially its whole length, which serves to strengthen or stiffen the bar, the laterally extending flange-like portions being at the topmost edge of the bar and serving also at the pivotal joint as a cover to exclude dust and particles falling from the platen when erasures are made; that the flange or web-like portions at the upper edge of the type bar gradually taper from the heel or hub portion of the bar to the type end thereof, being widest at the hub end of the type bar and narrowest at or near the type end of the bar, thereby not only providing a roof over the type bar joint and strengthening or stiffening the bar but doing this in a manner such as not to add materially to the weight of the type bar and to the touch of the key that operates it; that by providing the bushing or sleeve within the eye of the type bar and securing it against rotation by connecting it by a drive fit with the pin or rivet, the type bar is provided with an enlarged durable journal bearing; that by providing the pin or rivet with projections which enter depressions in the hanger, or in other words by corrugating both the rivet and hanger, the rivet and bushing are prevented from turning during the vibration of the type bars; that the bends or recesses 48 at the free ends of the type bar are offset from the median line of the bar, although the socket for the stem of the type is arranged practically in said median line; that one of the terminal types on the type block is arranged substantially over the type shank or stem (and which type is preferably the lower case type) and the other terminal type is formed on that portion of the block or body of the blank which is offset or overhanging and cuts into or overlaps the plane of the adjacent type bar but which said bar escapes during the action of the bar in consequence of the said bend or recess.

What I claim as new and desire to secure by Letters Patent, is:—

1. In a front strike typewriting machine, the combination of a hanger having a bifurcated portion, and a type bar received within the bifurcated portion of the hanger and having laterally extending web portions that extend over the hanger when the type bar is in the normal position and over the joint between the type bar and hanger and exclude dust from said joint.

2. In a typewriting machine, the combination of a hanger having a bifurcated portion, a type bar received within the bifurcated portion of the hanger and having laterally extending web portions that extend over the

- hanger and over the joint between the type bar and hanger and exclude dust from said joint, and a rivet that extends through the bifurcated portion of the hanger and connects the type bar to the hanger, said rivet being headed at opposite ends thereof.
3. In a typewriting machine, the combination of a hanger having a bifurcated portion, a type bar having an eye that is received within the bifurcated portion, a bushing within the eye, a pin that extends through the bifurcated portion of the hanger and through the bushing and rigidly connects the bushing to the hanger, and web-like portions that extend laterally from the type bar above the hanger and above the joint between the type bar and hanger, so as to exclude dust from said joint.
4. In a typewriting machine, the combination of a hanger having a bifurcated portion, a type bar having an eye that is arranged within said bifurcated portion, a hardened bushing seated within said eye, a soft pin that extends through the bifurcated portion and through said bushing and which is connected to said bushing, means for securing the pin to the bifurcated portion, and web-like portions that extend laterally from the type bar above the hanger and cover to the joint between the type bar and hanger and exclude dust from said joint.
5. In a typewriting machine, the combination of a hanger, a type bar carried by the hanger, and a laterally extending web carried at the upper edge portion of the type bar and extending outwardly from both sides of said type bar and above the joint between the type bar and hanger to exclude dust from said joint.
6. In a typewriting machine, the combination of a hanger having a bifurcated portion, a type bar carried by the hanger and arranged within the bifurcated portion, and a laterally extending web formed on the upper edge portion of the type bar and extending in opposite directions and covering the joint between the type bar and hanger in order to exclude dust from said joint.
7. In a typewriting machine, the combination of a hanger having a bifurcated portion, a type bar having an eye that is arranged within said bifurcated portion, a bearing bushing that is seated within the eye and on which the type bar turns, a soft pin that extends through the bifurcated portion and bushing and which is connected to said bushing to prevent it from turning, said pin being headed at one end and spun over at the other, and means for preventing the pin from turning relatively to the hanger.
8. In a typewriting machine, the combination of a hanger having a bifurcated portion, a type bar having a hardened eye that is received within said bifurcated portion, a hardened bearing bushing that is seated within the eye and on which the type bar turns, a soft pin that extends through the bifurcated portion and bushing and which is connected to both, and a laterally projecting web carried at the upper edge portion of the type bar and extending over the joint between the type bar and hanger to exclude dust from said joint.
9. In a front strike typewriting machine, the combination of a platen, a series of hangers arranged in a plane substantially coincident with the front face of the platen, and a series of type bars connected to said hangers, each type bar having an outwardly extending overhanging portion that lies between the hanger and the platen and covers the joint between the type bar and hanger.
10. In a front strike typewriting machine, the combination of a platen, a series of hangers arranged in a plane substantially coincident with the front face of the platen and each hanger having a bifurcated portion, a series of type bars, each type bar having an eye that is received within a bifurcated portion of a hanger, a series of headed pins, one for each type bar and hanger, and a dust-catching web that extends in opposite directions from the upper edge portion of each type bar and lies between the pivot of the type bar and the platen.
11. The combination of a hanger, and a type bar pivotally connected to said hanger and which is substantially T-shaped in cross section, the head of the T-shaped bar forming an overhanging dust-catching flange which projects over the type bar joint.
12. The combination of a bifurcated hanger, and a type bar which is substantially T-shaped in cross section and is received within and connected to the bifurcated portion of the hanger, the upper edge of said T-shaped type bar having a dust-catching web which covers the joint between the type bar and hanger.
13. The combination of a type bar, and a hanger, said type bar having a laterally extending overhanging flange which projects outwardly therefrom and extends over and covers the joint between the type bar and hanger and terminates at or near the outer sides of the hanger to exclude dust or grit from said joint.
14. In a front strike typewriting machine, the combination of a hanger having a bifurcated portion which opens upwardly, and a type bar which is substantially T-shaped in cross section and which is received within the bifurcated portion of the hanger and whose upper outwardly extending webs or flanges overlap the hanger and cover the joint between the type bar and hanger to exclude dust from said joint.
15. In a typewriting machine, the combination of a type bar and hanger, one of said parts being bifurcated to embrace the other, a pivot pin that extends through the bifurcated portion and through the part embraced thereby and which is headed at one end and spun over at the other, and means for securing the pivot pin against rotation relatively to said bifurcated portion.
16. In a typewriting machine, the combination of a type bar and hanger, one of said parts being bifurcated to receive the other, a bushing that is seated in the inserted part and which is of less thickness than the distance between the walls of said bifurcated portion, and a pin that extends through said bifurcated portion and said bushing.
17. In a typewriting machine, the combination of a type bar and hanger, one of said parts being recessed to receive the other and one of said parts being constructed to form a dust shield for the joint between the type bar and hanger, a pin that extends through the recessed portion and the part inserted therein and which is headed at one end and spun over at the other end, and means for securing the pin against rotation relatively to said recessed portion.
18. In a typewriting machine, the combination of a type bar and hanger, one of said parts being recessed to receive the other, a dust shield on one of said parts, a bushing that is seated in the part inserted within the recessed portion and which is of less thickness than the distance between the walls of said recessed portion, and a pin that extends through said recessed portion and bushing.
19. In a typewriting machine, the combination of a type bar, a removable hanger on which the type bar is directly pivoted and on which it swings to the printing position, and a contractile restoring spring connected at one end to the hanger and at the other end to the type bar and which exerts its greatest force to restore the type bar to the normal position when the type bar is in the printing position and whereby the type bar, hanger and restoring spring can be placed in position and removed together.
20. A type bar hanger having a cam face, and a set screw adapted to bear against the inclined face and secure the hanger in place.
21. In a typewriting machine, the combination of a slotted segment, a type bar hanger received within a slot in the segment and having an inclined face, and a set screw bearing against the said inclined face to hold the hanger in position.
22. In a typewriting machine, the combination of a slotted segment, a type bar hanger having a slotted portion and an inclined face, and a set screw supported in a threaded opening in the segment and projecting into the slotted portion of the hanger and bearing against said inclined face.
23. In a typewriting machine, the combination of a slotted segment, a type bar hanger having a slotted portion and an inclined face, bearing faces or shoulders at substantially right angles to each other on said hanger, said bearing faces or shoulders cooperating with like bearing surfaces on the segment, and a set screw in the segment projecting into the slotted portion of the hanger and bearing against said inclined face to force the bearing portions of the hanger to their seats on the segment.
24. In a typewriting machine, a series of segmentally

arranged type bars having recesses near the type bearing ends thereof, so that the type on one bar may pass through the recess of an adjacent bar.

25. In a typewriting machine, a series of segmentally arranged type bars with recesses near the type bearing ends thereof, said recesses being oppositely disposed at opposite sides of the series and so that the type block on one bar may pass through the recess of an adjacent bar.

26. In a typewriting machine, a series of segmentally arranged type bars, those at the center of the system being substantially straight whereas those at the sides of the system are recessed near their type bearing ends for the passage of the type block of an adjacent bar.

27. In a typewriting machine, a series of segmentally arranged type bars pivoted in a single plane, those at the sides of the system being recessed near their type bearing ends to avoid adjacent type blocks and said recesses being oppositely disposed at opposite sides of the system.

28. In a typewriting machine, the combination of a series of segmentally arranged type bars having type clearing recesses near their type bearing ends and all of said recesses opening outwardly towards the sides of the system.

29. In a typewriting machine, a series of segmentally arranged type bars having recesses in their sides near the type bearing ends of the bars, so that a type block on one bar may pass through a recess in an adjacent bar, said bars each having a plurality of types, one type being substantially aligned with the bar and the other offset.

30. In a typewriting machine, the combination with a platen, of a series of segmentally arranged type bars having recesses in the type bearing ends thereof, so that the type block on one bar may pass through a recess in an adjacent bar, said bars having each a plurality of types, a terminal type on each bar being aligned substantially with its bar, and the other type offset.

31. In a typewriting machine, the combination with a platen, of a series of segmentally arranged type bars having recesses in the type bearing ends thereof, a plurality of types on each of said bars, a terminal type on each bar being aligned substantially with its bar, and the other terminal type being offset and adapted to the recess in an adjacent bar.

32. In a typewriting machine, the combination of a slotted segment having the slots at gradually increasing distances apart as the sides of the segment are approached, type bar hangers secured in said slots, and type bars carried by said type bar hangers, said type bars having recesses therein for the clearance of types of adjacent bars.

33. In a typewriting machine, a pivoted type bar T-shaped in cross-section and gradually tapering from its hub or pivotal end to or nearly to its type end, the top of the T-shaped bar extending over the pivotal bearing of the type bar to exclude dust from said bearing.

34. In a typewriting machine, a type bar T-shaped in cross-section, the head of the T being along the upper edge of the bar and at such portion thereof that it will cover the type bar joint or bearing.

35. In a typewriting machine, a type bar having a plurality of types at its free end, one of said types being substantially in the median plane of said bar and the other being offset or overhanging, and a recess or bend formed in said bar at the type bearing portion so as to clear the overhanging portion of an adjacent type.

36. A type bar hanger, a support therefor, a securing device that cooperates with the support and hanger to secure the latter in place, one of said hanger and securing device elements having a cam with which the other element cooperates to position the hanger.

37. In a typewriting machine, the combination of an upwardly and rearwardly swinging type bar that turns on a fixed pivot, and a contractile restoring spring connected at one end to the underside of the type bar intermediate the ends thereof and at the other end to a point adjacent to the pivotal center of the bar and which exerts its greatest force to restore the type bar to the normal position when said type bar is in the printing position.

38. In a typewriting machine, the combination with a type bar, of a coiled restoring spring connected at one end to the type bar and fixed at its opposite end adjacent the

pivotal end of the type bar, said spring being arranged longitudinally of the type bar and maintained in this relationship both in the normal and printing positions of said type bar.

39. In a typewriting machine, the combination of a pivoted type bar, and a restoring spring which extends in the general direction of the length of the bar and is connected at one end to the type bar and at the other end to a relatively fixed point near the pivotal end of the bar so as to swing therewith and gradually expand as the type bar approaches the printing position and which is effective to restore the type bar to its normal position.

40. In a typewriting machine, the combination of an upwardly and rearwardly striking pivoted type bar having its type bearing end normally lying toward the front of the machine, and a restoring spring located below the type bar and attached at one end to the type bar about midway of its length and fixed at its opposite end near the pivoted end of the type bar and which exerts its greatest force to restore the type bar to the normal position when said type bar is in the printing position.

41. In a typewriting machine, the combination of an upwardly and rearwardly striking pivoted type bar having its type bearing end normally lying toward the front of the machine, and a restoring spring located below the type bar and extending in the general direction of the length of the bar, the spring being connected at one end to the type bar about midway of its length and fixed at its opposite end below the pivot of the type bar and the forward end of the spring being adapted to swing with the type bar and in the plane of its movement and which exerts its greatest force to restore the type bar to the normal position when said type bar is in the printing position.

42. In a typewriting machine, the combination of a type bar normally lying with its type bearing end toward the front of the machine, said type bar being formed with a lug on its underside and pivoted to swing upwardly and rearwardly in an arc to the printing position, and a restoring spring connected at one end of said lug and at its opposite end near the pivotal end of the type bar and which exerts its greatest force to restore the type bar to the normal position when said type bar is in the printing position.

43. In a typewriting machine, the combination of a pivoted upwardly and rearwardly striking type bar which normally lies with its type bearing end toward the front of the machine, and a restoring spring that extends in the general direction of the length of the bar and below the same and is attached at one end to the type bar about midway of its length and swings with the bar in the plane of movement thereof, the other end of the spring being fixed near and below the pivotal center of the type bar and so that the spring gradually expands as the bar approaches the printing center and which exerts its greatest force to restore the type bar to the normal position when said type bar is in the printing position.

44. In a typewriting machine, the combination of an upwardly and rearwardly swinging type bar which normally lies with its type bearing end toward the front of the machine, and a restoring spring that is located beneath the bar and extends in the general direction of the bar, said spring being fastened at its rear end below and forward of the pivotal center of the type bar and at its forward end to the type bar about midway of said bar, and so that the spring will swing with the type bar and in the plane thereof and will gradually expand as the type bar approaches the printing position and which exerts its greatest force to restore the type bar to the normal position when said type bar is in the printing position.

45. In a front strike typewriting machine, the combination of a type bar pivoted to swing in an arc to the printing position, and a coiled restoring spring arranged thereunder and longitudinally thereof, and so connected that it swings at its forward end with the bar in the general direction of the printing point and gradually expands during such movement and which exerts its greatest force to restore the type bar to the normal position when said type bar is in the printing position.

46. In a front strike typewriting machine, the combination of a type bar pivoted to swing in an arc to the

printing position, and a coiled restoring spring arranged longitudinally of the type bar and connected to swing with and substantially the same as the type bar and to increase in tension as the type bar moves towards the printing point and which exerts its greatest force to restore the type bar to the normal position when said type bar is in the printing position.

47. In a front strike typewriting machine, the combination with a pivoted type bar and an individual hanger therefor, of a coiled restoring spring arranged longitudi-

nally of the type bar and connected thereto and to the hanger and which exerts its greatest force to restore the type bar to the normal position when said type bar is in the printing position.

Signed at Syracuse, in the county of Onondaga, and 15 State of New York, this 5th day of January A. D. 1904.

HENRY W. MERRITT.

Witnesses:

GILES B. EVERSON,
SILAS W. CRANDALL.