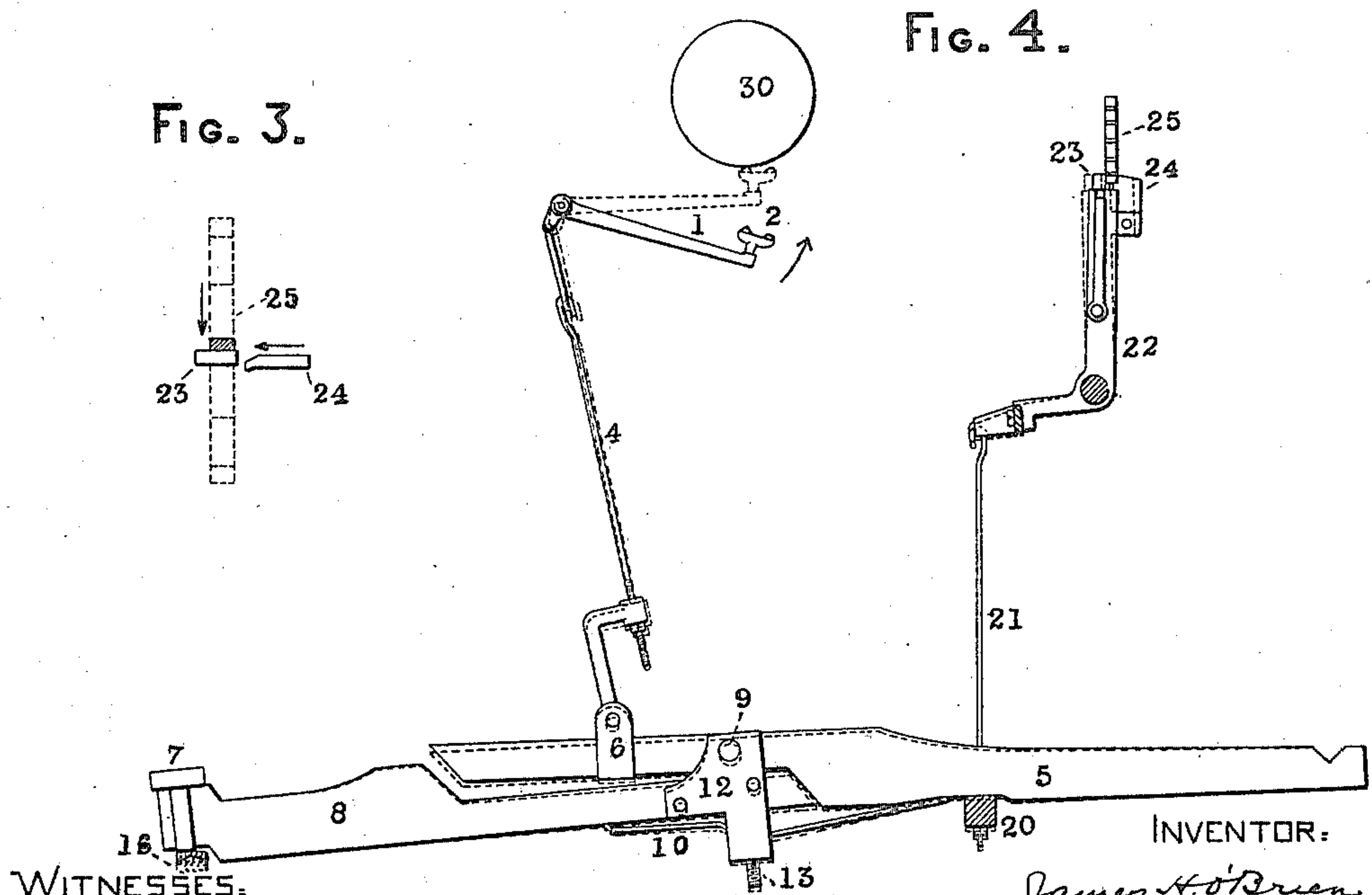
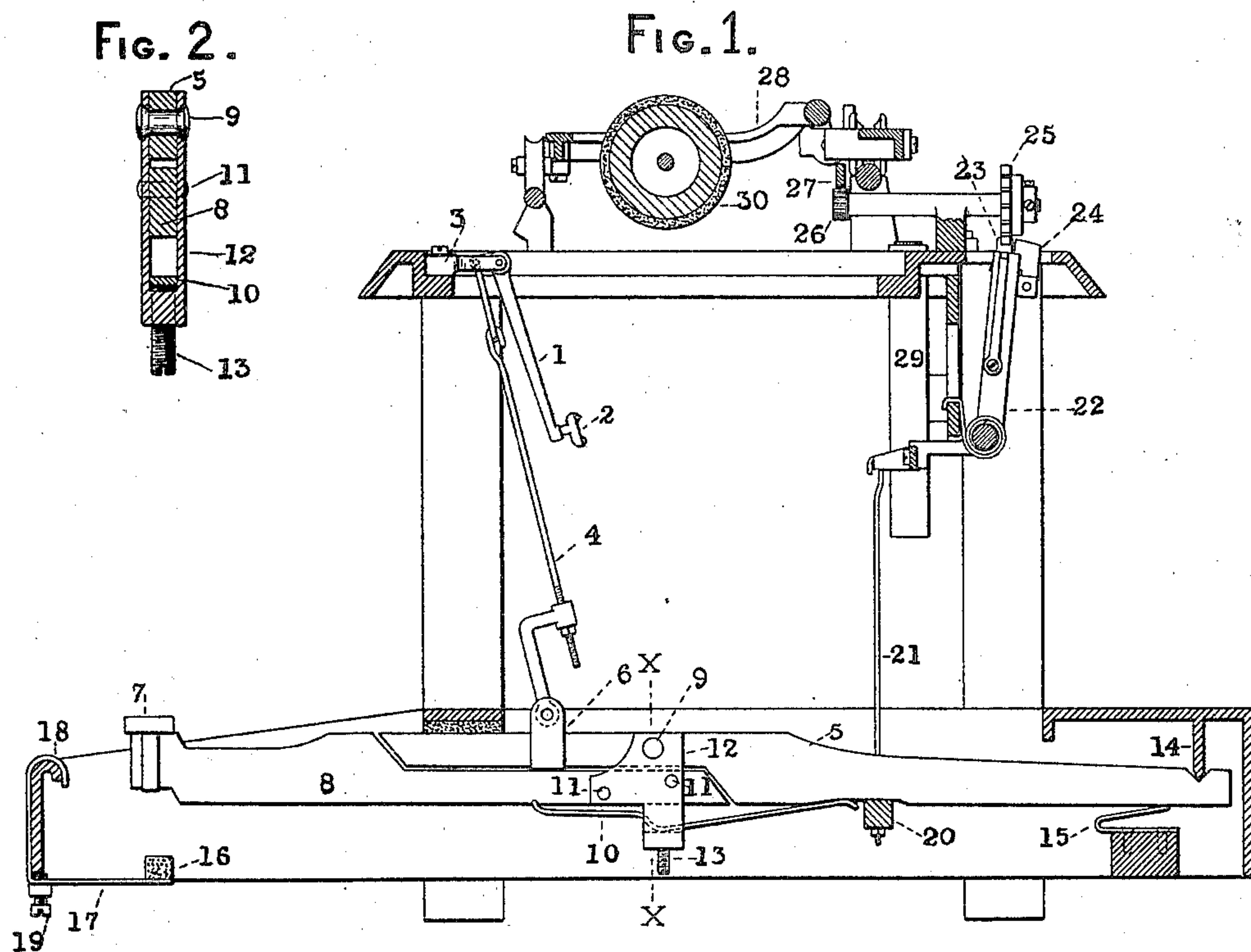


J. H. O'BRIEN.
TYPE WRITING MACHINE.

(Application filed May 11, 1900.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES:
K. V. Donovan.
G. M. Wells.

INVENTOR:
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by Jacob Felbel
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2 Sheets—Sheet 2.

FIG. 5.

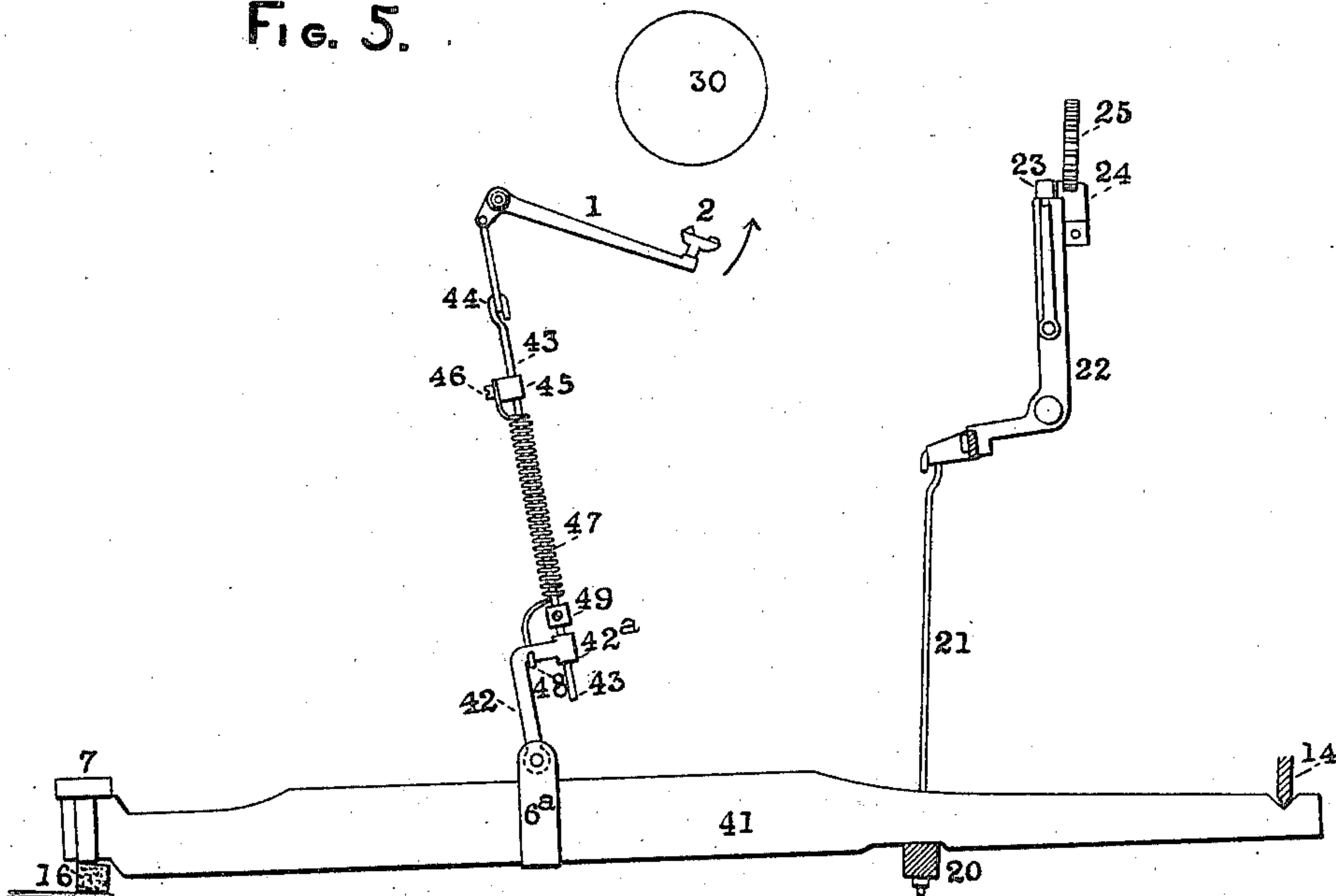


FIG. 6.

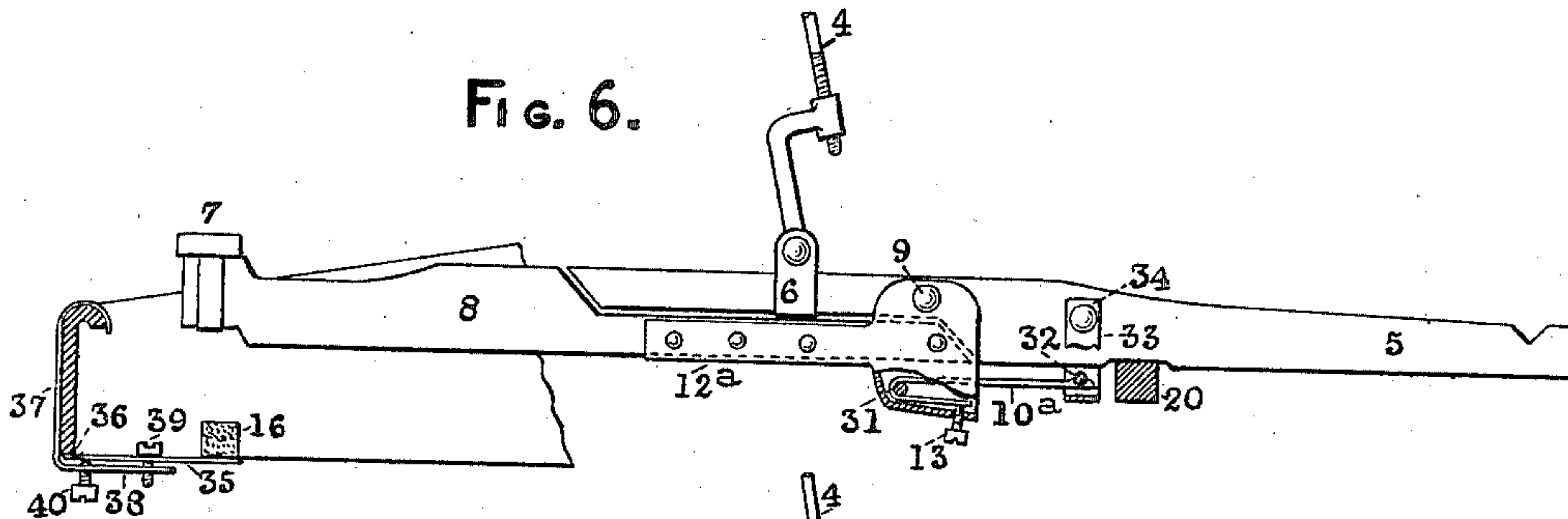
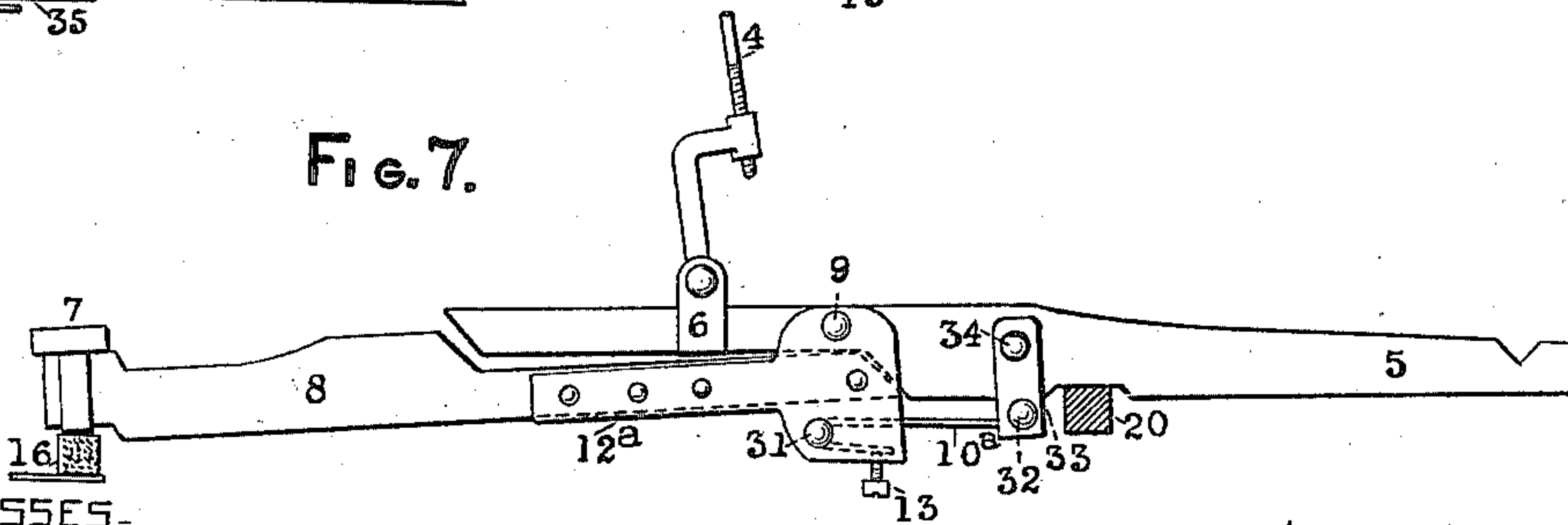


FIG. 7.



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UNITED STATES PATENT OFFICE.

JAMES H. O'BRIEN, OF NEW YORK, N. Y., ASSIGNOR TO WYCKOFF, SEAMANS & BENEDICT, OF ILION, NEW YORK.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 680,805, dated August 20, 1901.

Application filed May 11, 1900. Serial No. 16,303. (No model.)

To all whom it may concern:

Be it known that I, JAMES H. O'BRIEN, a citizen of the United States, and a resident of the borough of Brooklyn, in the city of New York, in the county of Kings and State of New York, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

10 This invention relates to the type-bar actions of type-writing machines, and its principal object is to prevent perforation of the paper and indentation of the platen by sharp or pointed types, such as the period or comma.

15 In attaining this object, however, I employ certain novel features of construction which may be adapted to all the keys upon the keyboard, so as to render the touch more elastic and agreeable and the operation of the machine less fatiguing. Hitherto there have been employed yielding connections between the type-bar and the key-lever for the purpose of securing an elastic and more agreeable touch than would be obtained by the usual

20 rigid or unyielding connection between the devices named. While it is one of the objects of my invention also to employ a yielding or elastic connection between the type-bar and the key for the same purposes as those just described, it is still another object of my invention to provide an elastic or yielding connection between the type-bar and the key for reducing the force of the blows of the pointed types on the paper and platen,

30 so as to avoid puncturing the paper and also indenting and mutilating the platen thereby. In none of the prior constructions, however, with which I am familiar is the elastic or yielding connection described capable of accomplishing the last-named object of my invention, for in all such prior mechanisms the connections are such as merely to relieve the blow or shock to the finger of the operator, thus providing an easy or soft start and

45 finish to the key-stroke, but not to appreciably delay the speed or action of the type-bar nor reduce its striking force upon the platen. Hence in all such prior constructions having for their object simply the attainment of an elastic and agreeable touch there is no regulation or diminution of the

force of the blow of the pointed types upon the paper, and in consequence periods and other sharp types puncture the paper and platen just as readily as in the ordinary rigid or inelastic construction.

To the ends and objects above mentioned my invention consists in the various features of constructions and combinations of devices hereinafter more fully described, and particularly pointed out in the appended claims.

In the accompanying drawings, Figure 1 is a vertical longitudinal central section of a Remington No. 6 type-writing machine embodying my improvements. Fig. 2 is an enlarged section of the key-lever, taken on line X X of Fig. 1. Fig. 3 is a diagrammatic plan view of the feeding-dogs and escapement-wheel, a tooth of the latter being shown in section. Fig. 4 is a skeleton view showing in full lines the position of the several parts at the instant the finger-key is arrested by contact with its stop, and also showing in dotted lines the position assumed by the parts when the type subsequently strikes the platen. Fig. 5 is a skeleton view showing my improvements as carried out in another way. In this view the key-lever is shown in its depressed position, the key end thereof being in contact with the stop by which it is arrested and the forward vibration of the dog-rocker is completed, but the type-bar is still moving toward the platen. Fig. 6 is a view of the preferred construction of the key-lever and its appurtenances, certain of the parts being broken away and others shown in section. Fig. 7 is a view somewhat similar to Fig. 6, but showing a position of the parts corresponding to that indicated in full lines at Fig. 4.

Throughout the several views similar parts are designated by similar numerals of reference.

Referring to Figs. 1 to 4, inclusive, the type-bar, designated as 1, bears at its free end a plurality of types 2, one of which may be a period or other punctuation-mark and is pivoted in a hanger 3. To a short arm of the type-bar is pivoted the upper end of a link or pull-rod 4, which at its lower end is pivotally connected to a lever 5 or to a strap 6, se-

cured thereon. A finger-key 7 is yieldingly mounted upon the lever 5, so that the key may have a limited independent movement bodily with reference to said lever, the object being to enable the key to yield relatively to the lever when it is struck sharply by the operator. The yielding connection between the key 7 and the lever 5 preferably consists of a lever 8, a pivot 9, and a spring 10. The forward end of the lever 5 overlaps the rear end of the lever 8, the two levers being arranged in the same vertical plane or edge to edge. Claspings the rear end of the lever 8 and secured thereto by rivets 11 is a yoke 12, the sides of which project upwardly, loosely embracing the lever 5 and working upon the pivot 9. The closed portion of the yoke extends downwardly from the lever 8 and affords a housing and bearing for the spring 10, one end of which extends forwardly and bears up against the under side of the lever 8 and the other end of which extends rearwardly and bears up against the under side of the lever 5. A tension-regulating screw 13, passing up through the closed part of the yoke, bears against the spring. Normally the spring sustains the key end of the lever 8. The two levers 5 and 8, taken together, have the general configuration of a key-lever such as used in the Remington machine, and in one way may be considered as a lever made in two sections and moving substantially as one piece. In its downward movement the lever turns upon the usual fulcrum 14, which is arranged transversely of the machine and cast integrally with the base. So long as there is a yielding or springy connection between the key 7 and the type-bar-operating portion of the lever it is not essential that the lever be made in two independent sections, as far as the main feature of my invention is concerned. The usual returning-spring 15 is provided for the key-lever and type-bar. In its descent the key 7 is arrested by a pad-stop 16, which is secured upon the rear end of a horizontal plate 17, the latter being bent upwardly at its forward end and hooking over the top edge of the base of the machine at 18. A screw 19, which engages a threaded hole in the plate 17, bears up against the under edge of the base and holds the plate or bracket in a fixed position. A transverse universal bar 20 extends horizontally beneath the key-levers and is connected by vertical hooks 21 with the forwardly-extending arms of the usual dog-rocker, the upright arm 22 of which carries both a pivoted spring-pressed feeding-dog 23 and a fixed detent-dog 24. An escapement-wheel 25 stands normally in engagement with dog 23 and is suitably connected to a pinion 26, which engages a rack 27 upon a carriage 28, the latter being propelled by a spring-drum 29 and carrying a cylindrical platen 30. In operation if the key 7 is depressed slowly the entire key-lever structure, including the portions 5 and 8, moves downwardly as one piece about the fulcrum 14, and through the

rod 4 the type-bar is swung to the platen to make the impression, the blow delivered by the slowly-moving type-bar not being sufficient, however, to cause a puncture of the paper by the sharp or pointed type thereon. If the key be depressed quickly, the operation is somewhat different. The tension of the spring 10 is such as to permit the lever 8 to vibrate independently upon the pivot 9 when the key is given a sudden blow, so that the increase or acceleration in the speed of the key movement is not communicated to the type-bar, which therefore swings up at a comparatively slow speed and lags behind the key, so to speak, it being understood that the lever 5 follows the lever 8, but at a slower rate of speed. This is essentially different from the usual construction in which the type-bar and key are positively connected, or so connected that when the key is struck sharply the type-bar moves with corresponding speed and causes the pointed type thereon to puncture the paper. The key is arrested in its downward movement by the stop 16, and at this instant if the key has been struck sharply the parts are in the several positions indicated by full lines at Fig. 4, from which it will be seen that, although the key-stroke is completed, the type is still swinging toward the platen and that the lever or section 5 is still descending, together with the universal bar. In other words, an advance movement of the key relatively to the type-bar has been permitted by the pivot 9, the lever 8 having in its quick descent vibrated upon said pivot relatively to the lever 5. While the key 7 is held momentarily depressed, the reaction of the spring 10 enables the type to complete its printing stroke, the lever 5 and the universal bar to also complete their downward movement and the dog-rocker to complete its forward movement, all as indicated at dotted lines at Fig. 4. It will thus be seen that when the key is depressed slowly an impression of the type is made simultaneously with the completion of the key-stroke, but that when the key is depressed sharply the type-bar delivers its blow after the arrest of the key. In other words, an acceleration of the key-stroke does not cause a corresponding acceleration of the type-bar stroke, the speed of the latter, and hence the blow of the type, being under the control of the spring 10, the tension of which may be increased or decreased, as desired. Upon the relief of the key from pressure the dog-rocker is returned to normal position by the usual spring, and the key-lever parts and the type-bar are returned by the springs 10 and 15. During the return movement of the dog-rocker the carriage is advanced a letter-space distance.

Referring now to Figs. 6 and 7, the form of the yoke 12^a is somewhat altered, its forward end being elongated and extending along the sides of the lever 8 to strengthen the latter. The forward portion of the spring 10^a is looped

around a cross-pin 31, fixed in the lower portion of the yoke, and the screw 13 bears upwardly against the free return end of the spring. The rear end of the spring is notched to engage a cross-pin 32, provided in a small depending strap or loop 33, loosely embracing the lever 5 and pivoted thereto at 34. The main object of this device is to prevent the ends of the spring from cutting into the edges of the levers, which are preferably made of wood. The strap or link 33 swings upon its pivot, as indicated at Fig. 7, during the vibration of the lever 8 about the pivot 9, thus permitting endwise movement of the spring without appreciable friction. The key-stop 16 is carried by a short horizontal plate or arm 35, whose forward end bears up against the under edge of the machine-base at 36. A plate 37 hooks over the top edge of the base and at its lower end 38 is bent to pass horizontally beneath the plate 35. A screw 39 passes loosely down through a hole in the plate 35 and engages a threaded hole in the plate 38, thus binding the two plates together. Another screw 40 engages a second threaded hole in the plate 38 and bears up against the under side of the plate 35, thus clamping the entire structure to the machine-base.

Referring now to the modification shown at Fig. 5, the key-lever is indicated at 41 as made in a single piece and connected to the type-bar by a strap 6^a and a connecting-rod, the latter being of peculiar construction. Pivoted to the strap 6^a and extending upwardly therefrom is an elbow-piece 42, upon the free end of which is formed a boss 42^a, which is perforated to receive and guide the lower end of a sliding rod 43, the upper end of which is pivoted to the short arm of the type-bar. This rod is preferably made in two parts, one rigidly secured to the other, as at 44, and the upper part being constructed for ready detachment from the type-bar in the usual manner. A collar 45 is adjustably secured upon the rod 43, near the upper end of the latter, by means of a screw 46, which engages a threaded hole in the collar and bears against the rod. A draw-spring 47 is coiled around the rod between the collar 45 and the elbow-piece 42, the upper end of the spring being hooked over the screw 46 and the lower end thereof being hooked under the horizontal member of the elbow-piece at 48. The spring tends to pull the rod 43 downwardly, and an adjustable stop-collar 49 is fixed upon the rod, so as to abut against the boss 42^a and limit such relative downward movement of the rod. In operation if the key be depressed slowly the parts all move together in the ordinary manner; but if the key be sharply depressed the spring 47 yields, permitting the downward stroke of the key-lever 41 to be completed prior to the completion of the printing stroke of the type-bar, as illustrated. During the momentary dwell of the finger upon the depressed key the upward move-

ment of the type-bar is completed by the reaction of the spring and the momentum of the parts and the impression is made. By adjusting the collar 46 along the rod the tension of the spring may be increased or diminished, as desired, so as to adapt the contrivance to either a fast or a slow operator, more tension being required for the former than for the latter, because a fast operator releases the key more promptly, and the expansion of the spring 47 and the movement of the stop 49 with the connecting-rod toward the elbow-lever stop 42^a, and hence the completion of the upward movement of the type, must take place or be finished before the finger-key returns to normal position. In this form of the invention, Fig. 5, the location of the stop 16 is not important, as any construction or device that will arrest the key prior to the completion of the type-bar stroke will serve the purpose, but some arresting means must be employed.

The form shown at Fig. 5 may be used in machines in which the feeding and detent dogs 23 24 stand exactly in line with each other, and hence in which there is no "drop" or movement of the escapement-wheel and carriage when the tooth of the escapement-wheel passes from one dog to the other during the downstroke of the key. In machines in which a drop is provided, however, as illustrated diagrammatically at Fig. 3, the period or other punctuation-mark is liable to print out of its true position upon the paper owing to the slight advance movement or drop of the carriage which occurs between the time the parts arrive at the position shown at Fig. 5 and the time the type impression is made. In machines in which drop is provided, or which are fitted with "reverse-feed" escapements, I prefer to use the divided key-lever of the other views, inasmuch as it permits the completion of the key-stroke in advance of the completion of the strokes of both the universal bar and dog-rocker, as illustrated in full lines at Fig. 4, which shows the escapement-wheel tooth still in engagement with the feeding-dog, although the key-stroke is completed. By means of this construction the speed of the dog-rocker is reduced to correspond with the speed of the type-bar, or, in other words, the motions of the two things correspond or synchronize in the usual manner, and the carriage is not therefore permitted to drop or advance until the type impression is made, the liability of irregularity in the positioning of the punctuation-mark being thus greatly reduced or eliminated. At Fig. 5 the movement of the dog-rocker is simultaneous with the key movement, but at Fig. 3 it is simultaneous with the type-bar movement; and the drop does not take place prematurely.

Many variations may be made in the construction and arrangement of the several parts without departing from the spirit of the invention.

Although I show my improvements as applied to a period or other punctuation key of the type-writer, it is obvious that the key-lever construction *per se* may be adapted to all the keys of the machine, so as to render the touch more elastic and agreeable to the operator. In such case the tension of the spring 10 or 10^a should be increased to such a point as to permit the key end of the lever to yield slightly when struck a sharp blow, but not so as to permit the type-bar to lag behind the key to an appreciable extent. In such a construction the stops 16 may, if desired, be omitted and the spring 10 or 10^a made of sufficient strength to arrest the key upon the contact of the type with the platen; but in all cases where it is desired to reduce the striking force of the sharp or pointed types or cause such types to move more slowly toward the platen it is essential that stops or arresting means, as 16, be employed, and in the broken or split lever construction this stop must be located under the forward or key-bearing portion.

It will be observed that the key-lever comprises two gaping sections, one arranged edgewise over the other, one of said sections being connected to the type-bar and the other of said sections being elastically mounted and bearing a finger-key, whereby the finger-key portion may move independently of the other portion when the key is struck sharply, so as to relieve the force of the blow on the finger, while at the same time the lever as a whole may vibrate upon its rear fulcrum to cause the type-bar to swing toward the platen. The lever, considered as a whole, is divided into two sections or parts by a gap or slot, which extends in the direction of the length of the lever, one of the sections being arranged above the other and a yoke or support being provided for preventing sidewise movement of one section or part relatively to or upon the other. It will also be noticed that the key-lever as a whole vibrates upon one fulcrum, as 14, or moves upon one support, and hence is to be distinguished from the class of positively-connected compound levers which depend upon the employment of two independent fixed fulcrums, one for each member of the two-part lever, although the invention obviously may be applied to either portion of a compound lever in case the latter is employed between the key and the type-bar. It will further be perceived that the yielding action occurs at the initial portion of the key-stroke and that in the form of the invention shown at Fig. 5 the force of the type-blow may be regulated by moving the collar 45 so as to adjust the tension of the spring 27, while in the forms shown in the other views said blow may be regulated by turning the screw 13 so as to regulate the tension of the spring 10 or 10^a.

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

1. In a type-writing machine, the combina-

tion with a platen, a type-bar and a lever connected thereto and working upon one fulcrum or support, of means, including a key elastically mounted upon said lever, for regulating the blow of the type.

2. In a type-writing machine, the combination with a type-bar, of a lever connected thereto and working upon one fulcrum or support, and a key elastically mounted upon said lever so that said key may have independent movement bodily with reference to said lever.

3. In a type-writing machine, the combination with a type-bar, of a key-lever working upon one fulcrum or support and divided into two portions, one portion being connected to the type-bar and the other portion bearing a key, said portions being elastically joined, so that the key-bearing portion may have a limited movement relatively to the portion that is connected to the type-bar.

4. In a type-writing machine, the combination with a type-bar, of a key-lever of the second order connected thereto and having an elastic construction between its ends, whereby the forward or key portion of said lever is enabled to yield relatively to the rear or type-bar-operating portion thereof when the key is struck sharply by the finger.

5. In a type-writing machine, the combination with a type-bar, of a key-lever having a single fulcrum, and composed of two parts, to one of which said type-bar is connected, and one of which parts is pivoted to the other, and a spring for maintaining said parts in their normal relation.

6. In a type-writing machine, the combination with a type-bar, of a lever connected thereto, a key-bearing lever pivoted and wholly supported upon one end of said lever, and a spring for maintaining said levers in their normal relation.

7. In a type-writing machine, a key-lever working upon one fulcrum or support and composed of separate sections pivotally connected together and movable substantially as one piece, the adjacent ends of said sections being overlapped and spring-supported.

8. In a type-writing machine, the combination with a platen of a type-bar, a lever connected thereto, a key elastically mounted upon said lever so as to yield relatively to said lever at the initial portion of the key stroke, and a stop.

9. In a type-writing machine, the combination with a platen of a type-bar, a key-lever working upon one fulcrum or support and so constructed that its key portion may during the printing stroke have a limited yielding advance movement relatively to the remainder thereof, a stop for said key portion of the lever, and means for connecting the other portion of the lever to the type-bar.

10. In a type-writing machine, the combination with a type-bar, of a horizontal key-lever composed of two parts, one of which is pivoted to the other, one only of said parts

being fulcrumed upon a fixed part of the machine and the other of said parts being provided with a key, a spring for maintaining said parts in their normal relation, and a connection attached at one end to said fulcrumed part of the lever and at the other end to the type-bar.

11. In a type-writing machine, the combination with a type-bar and a key, of a stop for said key and an elastic connection between the type-bar and the key, the construction and arrangement being such that upon the depression of said key, said elastic connection may expand or yield before said key is arrested by the stop and before the type-impression is made, and such that after the arrest of said key the movement of the type-bar may be aided by the contraction or reaction of said elastic connection.

12. In a type-writing machine, the combination with a platen, a type-bar, and a key, of an elastic connection between the key and the type-bar, and means for arresting the key during the printing stroke of the type-bar and before the type strikes the platen.

13. In a type-writing machine, the combination with a platen, a carriage, escapement devices, a universal bar, a type-bar, and a key, of an elastic connection between the key and the type-bar and universal bar, and a stop for arresting said key before the completion of the printing stroke of the type-bar and corresponding movement of the universal bar.

14. In a type-writing machine, the combination with a platen, a carriage, a universal bar, escapement devices constructed to permit advance movement or "drop" of the carriage upon the initial stroke of the universal bar, a type-bar, and a key, of a lever to which said type-bar is positively connected and which positively operates said universal bar, a key yieldingly connected to said lever so as to move in advance thereof when struck sharply, and a stop for arresting said key independently of said lever.

15. In a type-writing machine, the combination with a type-bar, of a key-lever connected thereto and working upon one fulcrum or support and so constructed that the key portion of said lever may have a limited yielding movement relatively to the portion thereof that is connected to said type-bar, a universal bar operated by the portion of said lever that is connected to said type-bar, escapement devices, and a carriage.

16. In a type-writing machine, the combination with a carriage, escapement mechanism, and a type-bar, of a lever connected to said type-bar and working upon one fulcrum or support, a universal bar operated by said lever and connected to said escapement mechanism, a key-bearing lever pivoted upon one end of said lever, and a spring for maintaining said levers in their normal relation.

17. In a type-writing machine, a key-lever working upon one fulcrum or support and composed of separate sections pivotally connected

together and movable substantially as one piece, the adjacent ends of said sections being overlapped, a key arranged upon one of said sections, a type-bar and a universal bar both operated by the other of said sections, an escapement mechanism, and a carriage.

18. In a type-writing machine, the combination with a type-bar, of a horizontal key-lever composed of two parts, one of which is pivoted to the other, one only of said parts being fulcrumed upon a fixed part of the machine and the other of said parts being provided with a key, a spring for maintaining said parts in their normal relation, a connection attached at one end to said fulcrumed part of the lever and at the other end to the type-bar, a universal bar operated by said fulcrumed part of the key-lever, escapement mechanism, and a carriage.

19. In a type-writing machine, the combination with a platen of a type-bar, a key-lever connected thereto and having an elastic construction, between its key and its point of connection to said type-bar so as to enable the key portion of said lever to yield at the initial portion of the key-stroke, when the key is struck sharply by the finger, independently of the portion which is connected to the type-bar, so that the motion of the type-bar is relatively slower than that of the key, a stop for arresting said key portion independently of the remainder of said lever, a universal bar operated by the rear portion of said lever, escapement mechanism, and a carriage.

20. In a type-writing machine, the combination with a platen, a sharp or pointed type, a type-bar, and a key, of means for automatically regulating the force of the type-blow, said regulating means including both a connecting-spring between said type-bar and said key, and means for adjusting the tension of said spring.

21. In a type-writing machine, the combination with a platen, a sharp or pointed type, a type-bar, and a key, of a connecting-spring between said type-bar and said key, means for adjusting the tension of said spring, and means for arresting said key independently of said type-bar.

22. In a type-writing machine, the combination with a platen and a type-bar of lever 5 connected to the type-bar, lever 8, yoke or clasp 12^a, pivot 9, and a spring carried by said yoke or clasp and bearing upon said lever 5.

23. In a type-writing machine, the combination with a platen and a type-bar of lever 5 connected to the type-bar, lever 8, yoke or clasp 12^a, pivot 9, looped spring 10^a, cross-pin 31, screw 13, and link 33 pivoted to lever 5.

24. In a type-writing machine, the combination with a platen and a type-bar of a key-lever yieldingly connected to the type-bar, stop 16, plate 35 carrying said stop, hooked angle-plate 37, 38, constructed to engage the framework of the machine, screw 39 for drawing the plate 35 toward the portion 38 of the plate, and screw 40 for pressing the plate 35

away from the portion 38 and against the framework of the machine.

25. A key-lever for type-writing machines, composed of separate sections, the adjacent 5 ends of which overlap and are connected by a yoke pivoted to one of said sections and fixed to the other, said yoke being provided with a downwardly-directed extension, and a spring arranged in said extension.

10 26. In a type-writing machine, the combination of a platen, a type-bar, and a key-lever fulcrumed at its rear end and comprising two gaping sections, one arranged edgewise over the other, one of said sections being connect- 15 ed to the type-bar, and the other being elastically mounted and bearing a finger-key, whereby the finger-key portion may move independently of the other portion when the key is struck sharply, so as to relieve the 20 force of the blow on the finger, while at the same time the lever as a whole may vibrate upon its rear fulcrum to cause the type-bar to swing toward the platen.

25 27. In a type-writing machine, the combination of a platen, a type-bar, a key-lever fulcrumed at its rear end and comprising two united gaping sections, one arranged edge-

wise over the other, one of said sections being connected to the type-bar, and the other 30 being elastically mounted and bearing a finger-key, and yielding at the initial portion of the key-stroke independently of the other portion when the key is struck sharply so as to relieve the force of the blow on the finger, 35 while at the same time the lever as a whole vibrates upon its rear fulcrum to cause the type-bar to swing toward the platen, and a stop for arresting the key-bearing section of said lever.

28. In a type-writing machine, a key-lever 40 having a gap or slot in the direction of its length and between its ends, said gap or slot dividing the lever into two sections or parts, one section or part being arranged above the other and united thereto, and a yoke or sup- 45 port for preventing sidewise movement of one section or part relatively to the other.

Signed at the borough of Manhattan, city of New York, in the county of New York and State of New York, this 10th day of May, 1900. 50
JAMES H. O'BRIEN.

Witnesses:

K. V. DONOVAN,
FLORENCE KEELING.