

J. A. EDLUND.
TYPE WRITING MACHINE.
APPLICATION FILED MAY 20, 1901.

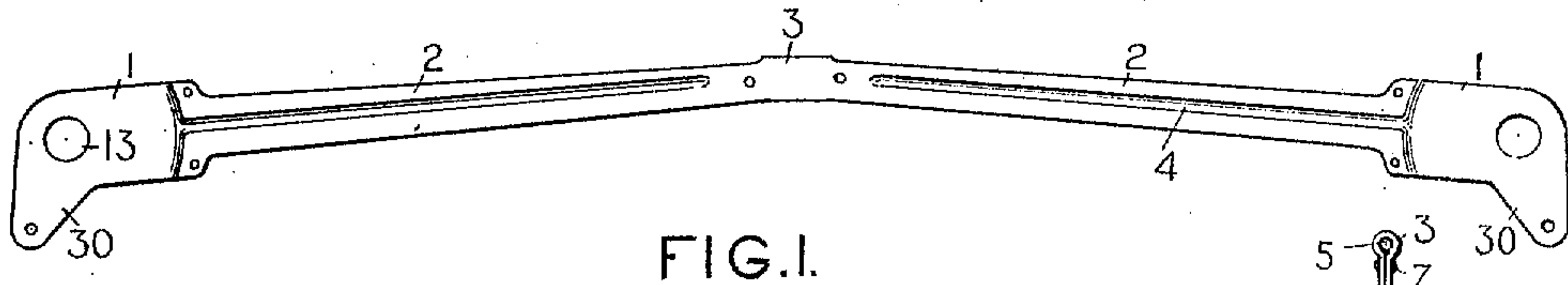


FIG. 1.

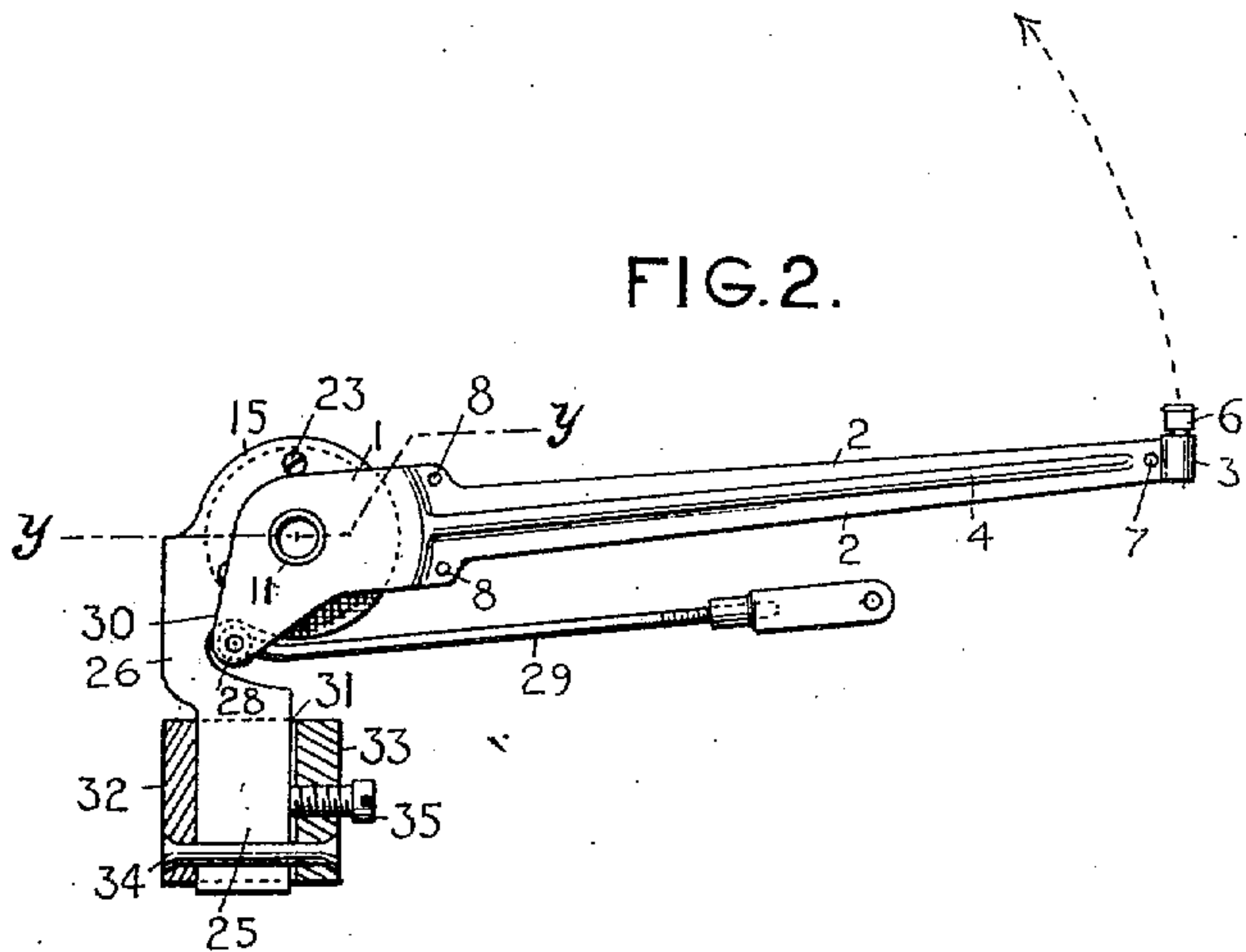


FIG. 2.

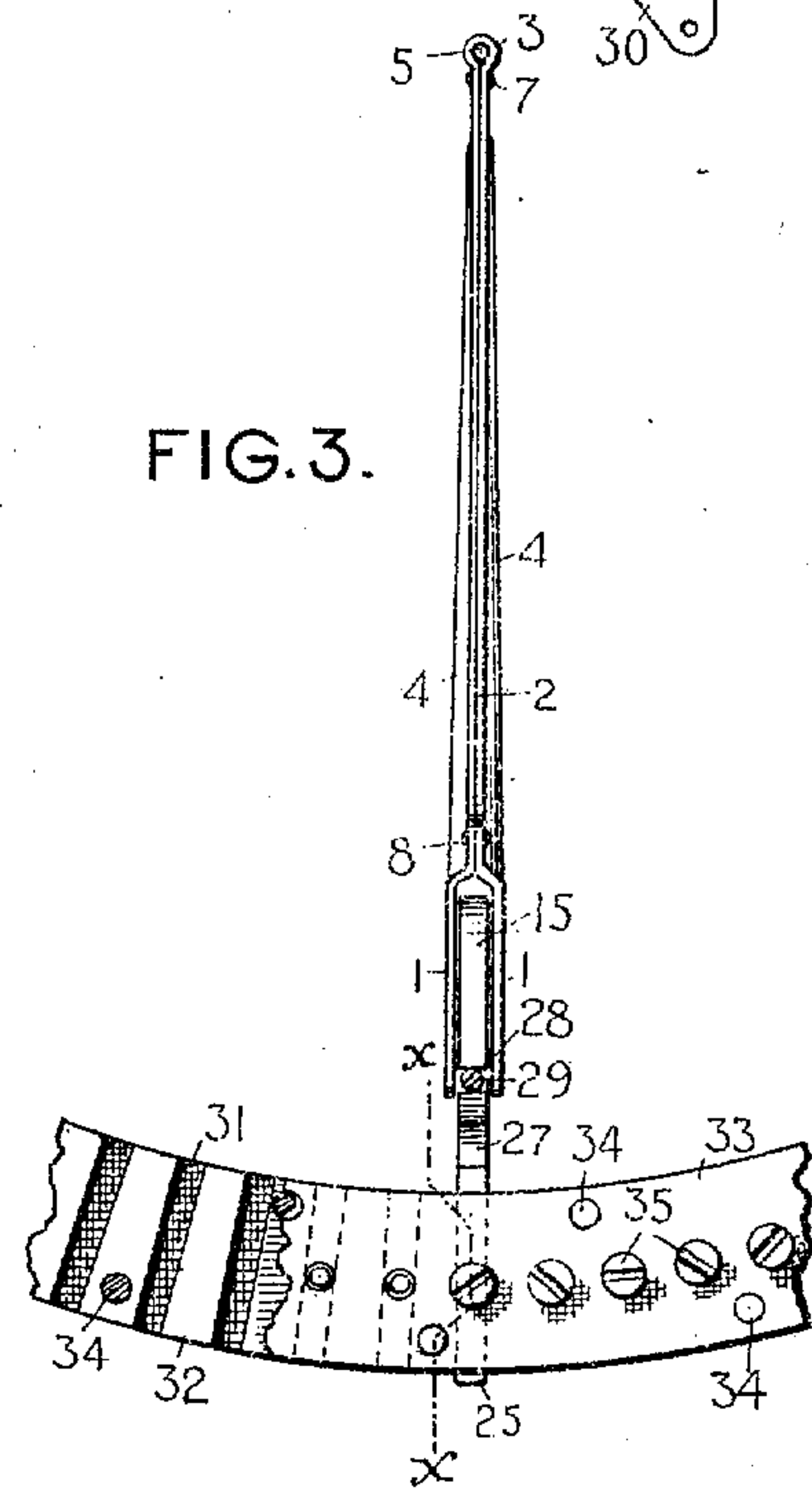


FIG. 3.

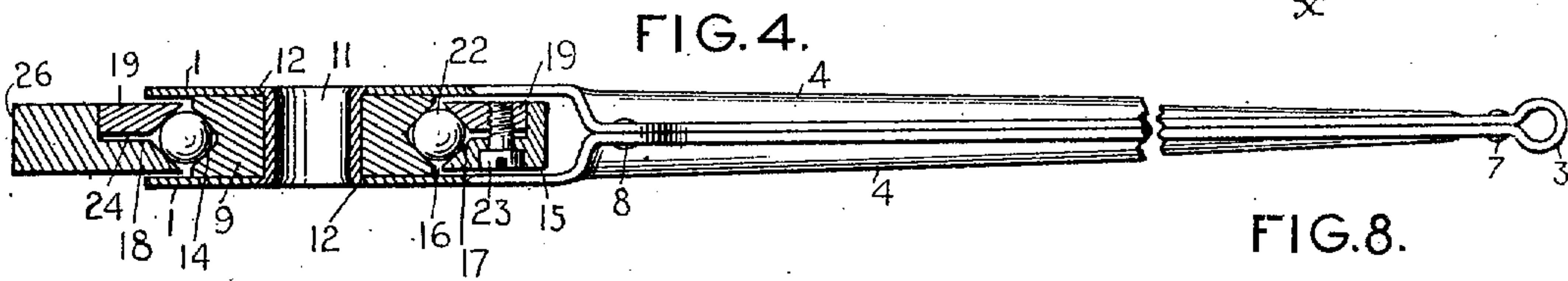


FIG. 4.

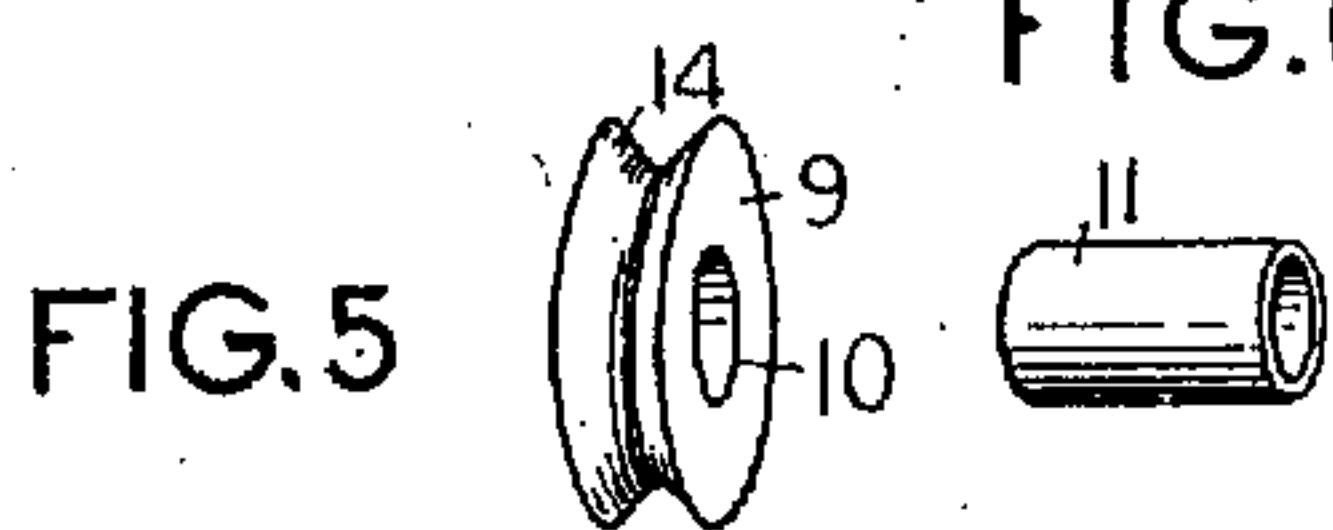


FIG. 5.

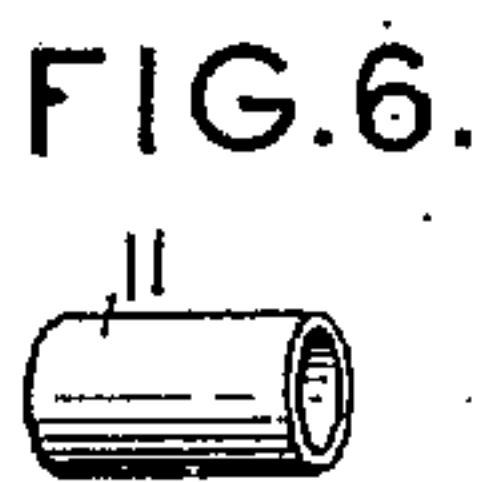


FIG. 6.

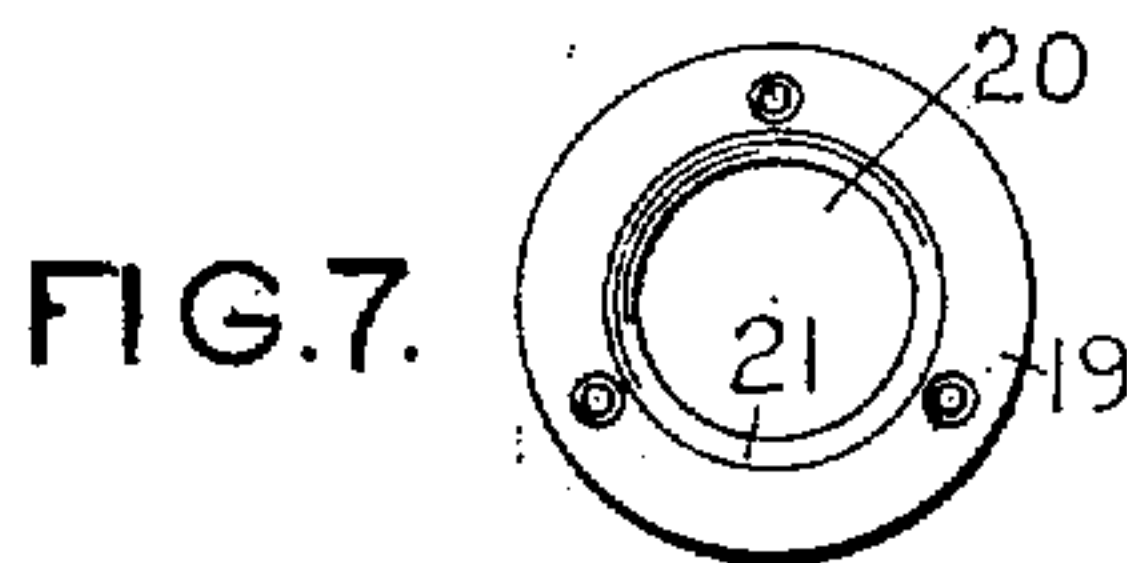


FIG. 7.

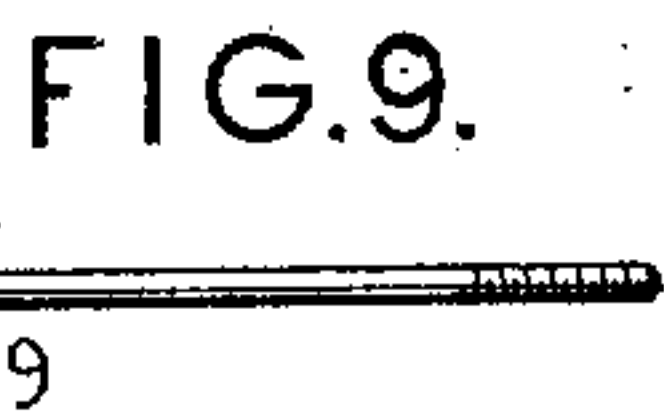


FIG. 9.

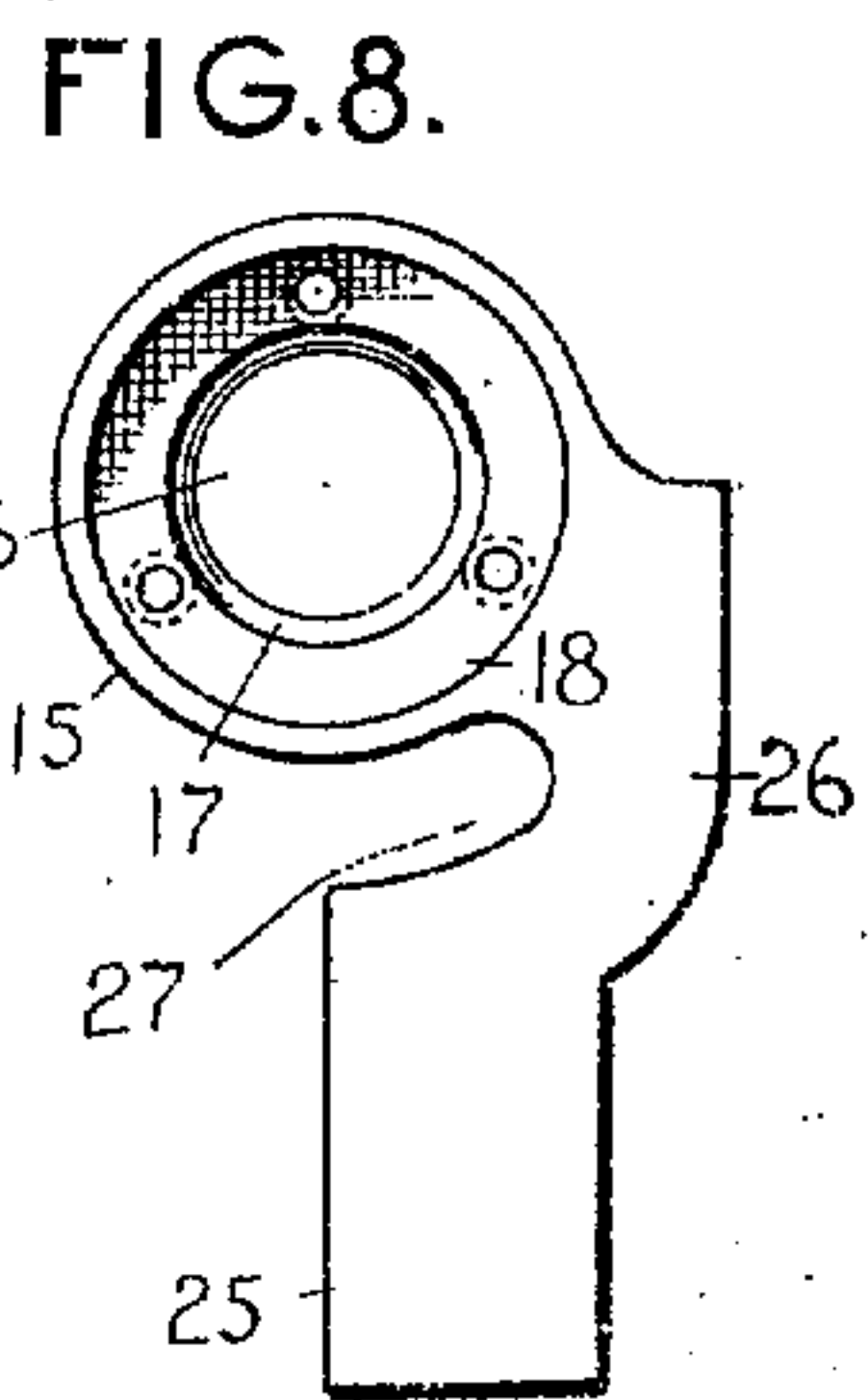


FIG. 8.

Witnesses:

E. M. Wells.
K. V. Donovan.

Inventor:

John A. Edlund
by Jacob F. Felt
His Attorney

UNITED STATES PATENT OFFICE.

JOHN A. EDLUND, OF SYRACUSE, NEW YORK, ASSIGNOR TO ALEXANDER T. BROWN, OF SYRACUSE, NEW YORK.

TYPE-WRITING MACHINE.

No. 883,393.

Specification of Letters Patent.

Patented March 31, 1908.

Application filed May 20, 1901. Serial No. 60,973.

To all whom it may concern:

Be it known that I, JOHN A. EDLUND, citizen of the United States, and 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.

This invention relates to type bars and bearings of writing machines, and its main objects are to produce a light and stiff type bar, and to provide therefor a thin bearing, so that a large number of bars may be mounted in a limited space; said bearing being adapted both to guide the type bar rigidly, so that the type may strike accurately to the printing center, and also to permit the type bar to swing freely.

A further object is to mount a set of hangers compactly about a common printing center.

My invention consists in certain combinations of devices, features of construction and arrangements of parts, all as will be hereinafter fully set forth and particularly pointed out in the concluding claims.

In the accompanying drawings:—Figure 1 is a view of a type bar blank ready for folding. Fig. 2 is a side elevation of a "front strike" type bar, its hanger, and a segment, the latter being shown in section on the line *x x* of Fig. 3. Fig. 3 is a front view of the devices shown at Fig. 2, with the type bar in printing position. Fig. 4 is an enlarged plan of the type bar and hanger, shown partially in section on the line *y y* of Fig. 2. Fig. 5 is a perspective view of a grooved type bar hub. Fig. 6 is a perspective view of an eyelet. Fig. 7 shows an adjustable ball-bearing cup or ring employed in the eye of the hanger. Fig. 8 is a face view of one portion of a hanger. Fig. 9 is a perspective view of a connecting rod.

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

The blank for the type bar is punched in strip form from thin sheet metal and has the outline of two type bars joined at their socket ends, as at Fig. 1. This blank comprises widened heads or hub plates 1 at the opposite ends of the strip, intermediate shank portions 2, and a socket portion 3 midway of the strip. A laterally projecting longitudinal U-section rib 4 is formed in each of the shanks 2. The strip is folded trans-

versely so as to bring the twin portions thereof together and form by the fold a hole or socket 5 to receive the stem of a type 6. The shank portions are secured together by a rivet 7 near the socket, and by top and bottom rivets 8 in the widened end of the bar, one upon each side of the rib 4. The shank portions 2 of the blank abut throughout their entire length, but the hub portions 1 are offset from the shanks so as to form a fork. The ribs 4 are flush with the offset sides of the hub and taper therefrom to nearly a vanishing point near the socket. This form of bar is very rigid and well adapted to withstand both bending and torsional stresses, while having little weight.

Between the forked plates of the type bar is confined a disk or hub 9, which is centrally perforated at 10 to receive a short tubular rivet or eyelet 11, whose ends are expanded at 12 to fit reamed holes 13 in the hub plates of the type bar, whereby said plates are clamped rigidly to the hub, and which is provided with a peripheral ball bearing V-groove 14.

The hanger or support for the type bar comprises a disk 15, which is confined between the hub plates and provided with a central perforation or eye 16, whose diameter is greater than that of the type bar hub 9, the edge of said eye being beveled or cupped at 17 to form a ball bearing surface for cooperation with the peripheral groove 14 in the type bar hub. The disk is also provided with an annular recess or depression 18, in which fits a disk 19 having an eye 20 corresponding to the eye 16, said eye 20 being beveled at 21 oppositely to the bevel 17, the bevels 17 and 21 forming a groove which cooperates with the groove 14 to form a race in which run a single circular series of bearing balls 22. The ring or disk 19 is detachably and adjustably secured to the hanger by screws 23, which are countersunk into the hanger and tapped into the ring, the length of the screw being preferably equal to the thickness of the hanger plate, and a crevice or space 24 being left between the ring and the hanger plate so as to enable the screws to draw the ring inwardly so as to take up shake in the joint. Thus it will be seen that the type bar is rigidly secured against lateral vibration, and at the same time it is enabled to vibrate freely to the printing point while the width of the hub or bearing is reduced to a

minimum, so that a large number of type bars may be assembled in a limited space.

The hanger base 25 is united to the disk or eye portion 15 by an arm or neck 26, which is 5 curved or notched so as to form a recess or clearance 27 for the enlarged head 28 of a link 29, said head being pivoted between short arms 30 formed upon the opposite hub plates of the type bar, and the link being 10 connected at its forward end to a key-operated lever (not shown). The hanger base 25 is inserted in one of a series of slots or notches 31 formed in a segment 32, the notches extending radially of the printing center and 15 being open at the forward side of the segment, and the latter being provided with a cover plate 33, which is permanently and rigidly secured thereto by rivets 34. The hangers are inserted endwise into the rectangular apertures formed by the coöpera- 20 tion of the slots with the cover plate, and are retained by set screws 35 tapped into the cover plate and bearing against the front edges of the hangers. The latter fit snugly 25 into the slots but are adjustable radially therein. Thus it will be seen that both the type bars and the hangers may be assembled in a limited space, and without sacrificing the advantages of the ordinary adjustable hang- 30 ers having wide bearings for the type bars.

It will be seen that means are provided for pivotally supporting said type bar and preventing lateral vibration thereof, said means including a single circular series or set of 35 bearing balls running in a groove formed upon the periphery of the hub of the type bar; that the type bar is longitudinally divided or cleft at its hub portion so as to fork or embrace the hanger eye, that is, the portion of the hanger which surrounds the hub; 40 that the exterior groove in the hub is opposed by the interior groove in the eye; that the hub plates 1, between which the eye portion of the hanger is confined, are fastened to the hub 9 by the transverse fastening device or eyelet 11; that the type bar is composed of 45 layers or plates, preferably formed upon a single blank, which is folded to bring the plates together, the fold being formed transversely of the blank; that the hub 9 is confined between the plates of the type bar, or in other words, between the ends of the strip of which the type bar is made, said ends being separated or offset to make room for the 50 hub and to straddle the eye portion of the hanger; that the interior groove in the eye portion of the hanger has an adjustable side 19, whereby the ball-bearing joint may be tightened; that the hanger has a two-part 55 eye, one part being adjustably mounted upon the other part, and said parts being provided with opposing ball-bearing surfaces, which together form an interior groove in the eye; that the balls 22 are adjustably held in the 60 groove of the hub; that the type bar is pro-

duced from a sheet metal strip which is transversely folded so as to form a type socket and brought together so as to form the shank of the type bar; that longitudinally extending integral lateral ribs or beads are 70 pressed or formed in the strip; that the ends of the strip are offset from the shank portions thereof, so as to form separated hub plates, which are made considerably wider than the shanks; that means are provided for clamp- 75 ing the offset portions of the strip against the grooved hub or ball-bearing filling block 9; and that the type bar comprises contiguous twin plates secured together and having at one end a type socket and at the other end an 80 intervening or internal hub provided with a ball groove.

Various changes in design and details of construction may be made without departing from the spirit of my invention, and 85 some features may be used without others. Also there may be a transposition of the parts, that is to say, the type bar may be fashioned as a hanger, and the hanger as a 90 type bar, while still retaining the novel construction of ball bearing joint between the two members; and some of the claims herein are intended to cover the joint whether used as just explained or as shown in the draw- 95 ings. In order to cover the reversal specifically, a separate application will be filed therefor.

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

1. The combination of a hanger, a type 100 bar, one of said members being formed of folded sheet metal and also having a cleft hub provided with a separate internal peripherally-grooved hub, and the other of said 105 members having an eye portion surrounding said hub, and a set of bearing balls working between the eye and the hub.

2. In a typewriting machine, the combination of a type bar, a hanger, and a ball bearing joint between the type bar and hanger, 110 said ball bearing joint comprising a grooved one-piece hub separate from but connected to the type bar, the groove in said hub being in the median plane of the type bar, an eye on the hanger, said eye having an adjustable 115 member for effecting a relative adjustment between the bearings, and a set of balls between said eye and hub.

3. In a type bar and hanger ball-bearing joint, the combination of a peripherally 120 grooved one-piece hub, an interiorly grooved eye surrounding said hub, a set of bearing balls confined between the eye and the hub, and opposing plates between which the eye and the hub are confined, said plates being 125 secured to said hub and forming part of one of the type bar and hanger members, and one of said eye and hub elements having an adjustable ball-bearing surface.

4. The combination of a hanger, a type 130

- bar, one of said members having an eye portion provided with an interior groove with relatively adjustable side walls and the other of said members being cleft so as to straddle said eye portion, said cleft member having an exteriorly grooved internal hub surrounded by said eye portion, and a set of bearing balls running in the race formed by the cooperation of said grooves.
5. The combination of a hanger, a type bar, one of said members having a hub and the other having a two-part eye, one eye-part being mounted upon the other eye-part, and said eye-parts being provided with opposing ball bearing surfaces which together form an interior groove in the eye, and a set of bearing balls.
6. The combination of a hanger, a type bar, one of said members having a hub and the other having a two-part eye, one eye-part being adjustably mounted upon the other eye-part, and said eye-parts being provided with opposing ball bearing surfaces which together form an interior groove in the eye, and a set of bearing balls.
7. The combination of a hanger, a type bar, one of said members having a grooved hub, and the other having an eye portion surrounding the hub and provided with a ball bearing surface, a ring having a corresponding ball bearing surface and adjustably secured to said eye portion, and a set of bearing balls.
8. In a type bar and hanger ball-bearing joint, the combination of disk 15 having eye 16, and ball bearing surface 17, disk 19 having eye 20 and ball bearing surface 21, screws 23, and a set of bearing balls.
9. The combination of a hanger, a type bar, one of said members being formed of sheet metal and having opposing hub plates, a peripherally grooved hub inserted and fastened between said plates, and the other of said members having a two-part eye confined between said hub plates and surrounding said hub, and a set of bearing balls.
10. In combination, a hanger having an eye provided with an adjustable interior groove, a cleft type bar between whose sides the eye is confined, said type bar having an exteriorly grooved hub surrounded by said eye, and a set of bearing balls running in the race formed by said grooves.
11. In combination, a hanger having both a base and a ball-bearing eye portion, a ring secured to said eye portion and provided with a ball bearing surface, a grooved hub surrounded by said eyes, and a cleft type bar between the sides of which said hub is secured.
12. In combination, a hanger having a base 25 and an eye portion provided with a ball-bearing surface, a ring secured by screws upon said eye portion and having an opposing ball-bearing surface, a folded sheet-metal type bar between the sides of which said eye-portion and ring are confined, a type-bar hub surrounded by said eye, and a set of bearing balls.
13. In combination, a type bar formed from a folded and riveted sheet-metal blank and having an internal peripherally grooved hub and a transverse fastener, a hanger having an eye portion surrounding said hub and confined between the sides of the type bar, and a set of bearing balls working between the eye portion and the hub, the eye portion of the hanger being composed of cooperating perforated plates having opposing ball-bearing surfaces, which together form an interior groove in the eye.
14. The combination of a type bar having widened hub plates 1 and internal peripherally grooved hub 9, eyelet 11, an internally grooved eye portion arranged between said plates and surrounding said hub, and balls 22 interposed between the hub and the eye.
15. In combination, a type bar comprising a transversely folded sheet-metal strip having a type socket at the fold, a peripherally grooved hub secured between the adjacent ends of the strip, an eye surrounding said hub and confined between said strip ends, and a set of bearing balls.
16. In combination, a type bar comprising a transversely folded sheet metal strip having a type socket at the fold, the shank portions of the strip abutting and the ends of the strip being offset from the shank portions, a peripherally grooved hub-block secured between said offset ends, an interiorly grooved eye portion surrounding said hub and confined between said offset ends, and a set of bearing balls between the eye portion and the hub.
17. In combination, a type bar comprising a transversely folded sheet-metal strip longitudinally ribbed and having a type socket at the fold, the shank portions of the strip abutting and being riveted together, and the ends of the strip being offset, a hub secured between said offset ends, an eye surrounding said hub and confined between said offset ends, and a set of bearing balls.
18. In combination, a type bar comprising a transversely folded sheet metal strip having a type socket formed by the fold and also having perforated hub ends, a peripherally grooved hub inserted between said ends, a device projecting at each side of the hub and extending into said perforations and expanded or riveted over the edges thereof, an interiorly grooved eye surrounding said hub and confined between said ends, and a set of bearing balls.
19. In combination, a type bar comprising a transversely folded ribbed sheet metal strip having a type socket at the fold and also having perforated ends, a perforated hub inserted between said ends, a fastening device

passing transversely through all of the perforations, an eye surrounding said hub and confined between said ends, and a set of bearing balls.

20. In combination, a type bar comprising a transversely folded sheet metal strip having tapering ribs formed therein and also having a type socket formed by the fold, the shank portions of said strip being riveted together and the end portions being offset, a peripherally grooved perforated hub confined between said end portions, an eyelet passing through said hub and securing said offset ends thereto, an eye portion surrounding said hub and confined between said offset ends, and a set of bearing balls between the eye and the hub.

21. In combination, a type bar comprising a sheet metal ribbed strip folded transversely so as to form a type socket, the shank portions of the strip being riveted together and the hub-portions thereof being widened and riveted, said hub portions being also offset and perforated and having short arms, a hub inserted between said hub portions and fastened thereto, an eye surrounding said hub and confined between said hub portions, and a set of bearing balls.

22. A type bar hanger comprising a base 25 and a disk 15 having an eye 16 provided with a ball-bearing surface 17, and a ring or disk 19 attached to the disk 15 and having an eye 20 and ball bearing surface 21.

23. A type bar hanger comprising a base 25 and a disk 15 having an eye 16 provided with a ball-bearing surface 17, and a ring or disk 19 secured by screws 23 to said disk 15 and having an eye 20 and ball-bearing surface 21.

24. A type bar hanger having a base 25, disk 15 having a recess 18, an eye 16, and a ball bearing surface 17, and a disk 19 secured in the recess 18 and provided with ball bearing surface 21.

25. In combination, a hanger having a base 25, a disk 15, having a recess 18, an eye 16, and ball bearing surface 17, a disk 19 fitting in said recess and having eye 20 and ball bearing surface 21, screws 23, a set of bearing balls, and a type bar.

26. A ball-bearing type-bar hanger having a base 25 and disk 15 connected by neck 26 having notch 27, annular recess 18, eye 16, ball-bearing surface 17, and disk 19 secured in said recess and having eye 20 and ball-bearing surface 21.

27. A type bar formed from a sheet metal strip transversely folded and having a type socket at the fold, the shank portions of the strip abutting and being formed with longitudinally extending integral lateral ribs pressed therein, and the ends of the strip being offset so as to form separated hub plates.

28. A type bar produced from a sheet metal strip transversely folded and having a

type socket at the fold, the shank portions of the strip abutting and being formed with longitudinally extending lateral ribs pressed therein and the ends of the strip being offset so as to form separated hub plates, said ribs being substantially flush with said plates and tapering towards the type socket.

29. A type bar comprising a transversely folded sheet metal strip having a type socket at the fold and also having perforated ends, a hub block inserted between said ends, and a device projecting at each side of the hub block and extending into said perforations and expanded or riveted over the edges thereof.

30. A type bar comprising a transversely folded sheet metal strip having a type socket at the fold and also having perforated ends, a perforated hub inserted between said ends, and a fastening device passing transversely through all of the perforations.

31. A type bar comprising a transversely folded sheet metal strip having a type socket at the fold, a perforated hub inserted between the adjoining ends of the strip, and an eyelet.

32. A type bar comprising a sheet metal strip folded transversely so as to form a type socket, the shank portions of the strip abutting and being riveted together and being also formed with longitudinal ribs, the ends of the strip being widened and united by rivets at the widened portions, and said widened portions being also offset and perforated, a hub inserted between said offset portions, and means for clamping said offset portions against said hub, said ribs being substantially flush with said offset portions and tapering to a vanishing point near the type socket, and the shanks being also united by a rivet near said socket.

33. A type bar comprising contiguous twin plates secured together and having at one end a type socket and at the other end an intervening hub provided with a ball groove.

34. A blank for a folded type bar consisting of hub-plates 1 at the ends thereof, shanks 2 having ribs 4 pressed therein, and a socket portion 3, the hub plates being offset from the shanks and the ribs 4 being flush with the hub plates and tapering towards the socket portion.

35. In combination, a type bar segment having a series of radial slots 31 and a cover plate 33 secured thereto, and a series of type bar hangers inserted in said slots and retained therein by set screws.

36. In combination, a type bar segment having a series of radial slots 31 and a cover plate 33 secured thereto, and a series of type bar hangers inserted in said slots and retained therein by set screws tapped into said cover.

37. In combination, a type bar segment having a series of slots cut radially therein

and provided with a rigidly attached cover plate, and a series of hanger plates adjustable radially in said slots and retained therein by set screws.

38. In combination, a type bar segment having a series of radial slots 31 and a cover plate 33 secured thereto, and a series of type bar hangers inserted in said slots and retained therein by set screws, each of said hangers being provided with an interiorly grooved eye, and pivotally supporting a type bar by means of bearing balls working in said eye.

39. In combination, a type bar segment having a series of radial slots formed therein and a cover plate, a series of plate-like hangers inserted in said slots and carrying type bars, and a series of set screws in said cover plate and bearing upon the edges of said hangers.

40. The combination with a hanger, of a type bar having a cleft end and embracing said hanger, one of said type bar and hanger members having an eye provided with an interior ball bearing, and the other of said members having a peripheral ball bearing, and a set of balls running in said bearings.

41. The combination of a type bar formed from a folded and riveted sheet metal blank and having a peripheral ball bearing surface and a transverse fastener, a hanger having an eye portion surrounding said peripheral ball bearing surface and confined between the sides of the type bar, and a set of bearing balls.

42. The combination of a type bar comprising a transversely folded sheet metal strip having a type socket at the fold, a peripheral ball bearing surface at the other end of the type bar, a hanger having an eye surrounding said peripheral ball bearing surface and confined between the sides of the type bar, and a set of bearing balls.

43. The combination of a type bar comprising a transversely folded sheet metal strip longitudinally ribbed and having a type socket at the fold, the shank portions of the strip abutting and being riveted together and the ends of the strip being offset, a peripheral ball bearing surface disposed between the offset portions, a hanger having an eye surrounding said ball bearing surface and confined between said offset ends, and a set of bearing balls.

44. A type bar comprising a transversely folded sheet metal strip having a type socket at the fold and also having perforated ends, a peripheral ball bearing surface disposed be-

tween said perforated ends, and a transverse fastener passing through the perforations.

45. A type bar comprising contiguous twin plates secured together and having at one end a type socket and having at the other end separated plates and an intermediate peripheral ball-bearing surface.

46. An anti-friction bearing for type bars comprising a hanger provided with an eye having an annular ball-race, and a type bar pivoted to swing in the median plane of said ball race and provided with an annular ball-race arranged opposite the ball-race of the hanger, a side wall of the eye of the hanger being formed of a plate separate from the body of said hanger and adjustable to different planes parallel to the plane of the ball-race.

47. The combination of a type-bar hanger, a type-bar, one of said members having an interiorly grooved eye and the other of said members being cleft or bifurcated and embracing said eye, an exteriorly grooved hub within said eye, a series of bearing balls in the race formed by said grooves, said eye element having an adjustable section constituting one of the side walls of the ball-race, and a pin supporting said hub between the arms of said bifurcated member.

48. The combination of a type-bar hanger, a type bar, one of said members having an eye, a hub within said eye, a support for securing said hub upon the other of said members, a ball-race intermediate said eye and hub, and anti-friction balls in said race, and a separable plate adjustably mounted for holding said balls within said race, the adjustment of said plate section being independent of said support.

49. In a typewriting machine, the combination of a type bar hanger having an eye 16 and a ball bearing surface 17, an eye-like member 20 having a ball bearing surface 21, screws 23 for securing said eye-like member to the eye of the hanger and for adjusting it relatively thereto, a type bar having a ball bearing, and a set of balls between the ball bearing of the type bar and said ball bearing surfaces 17 and 21.

Signed at Syracuse, in the county of Onondaga, and State of New York, this 8th day of May A. D. 1901.

JOHN A. EDLUND.

Witnesses:

W. H. BROWN,
H. A. CARHART.