

(No Model.)

4 Sheets—Sheet 1.

C. V. BOUGHTON.  
SIGNAL TELEGRAPH.

No. 597,536.

Patented Jan. 18, 1898.

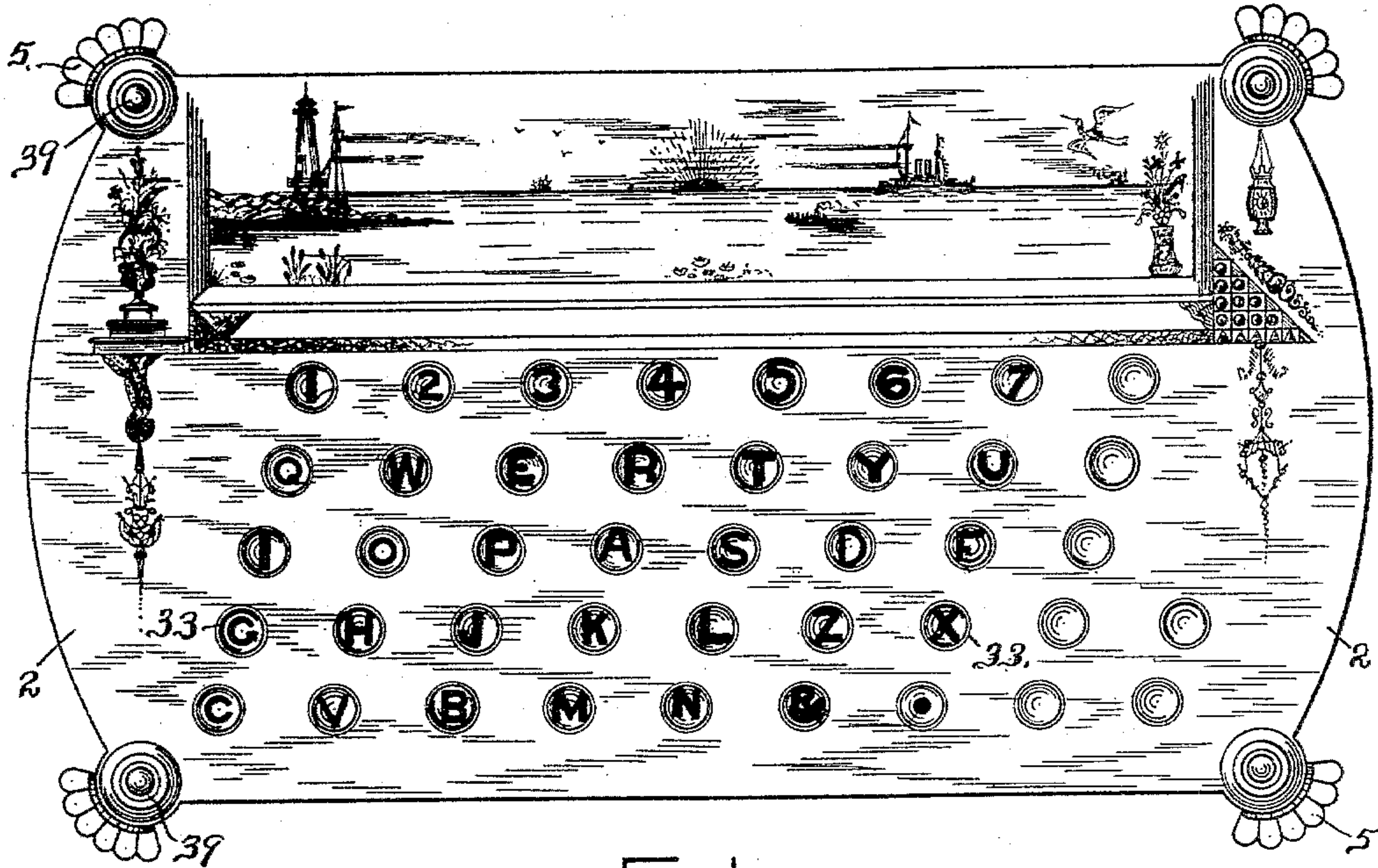


Fig. 1.

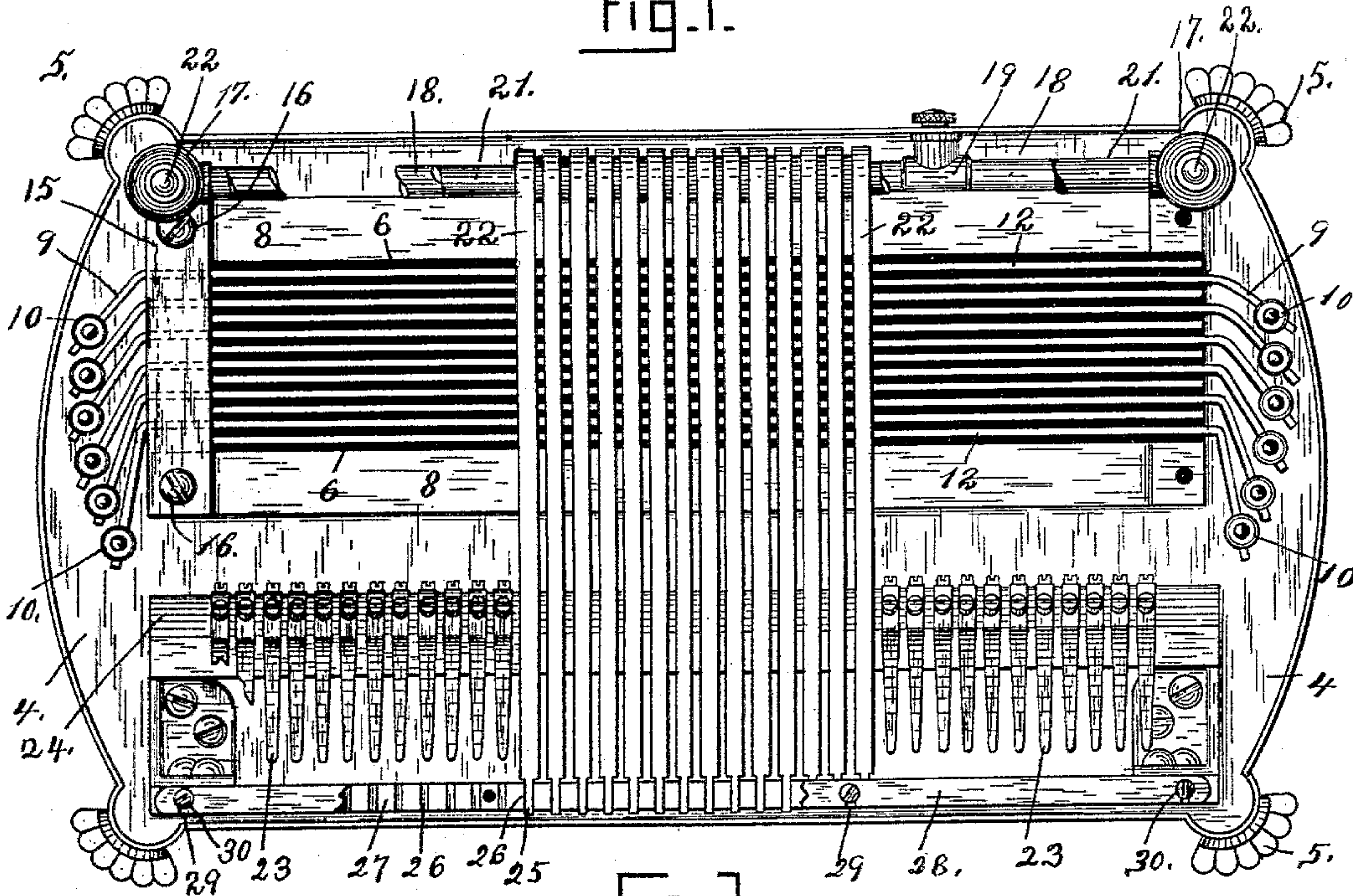


Fig. 2.

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INVENTOR.

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by *W. T. Miller*  
*Atty*



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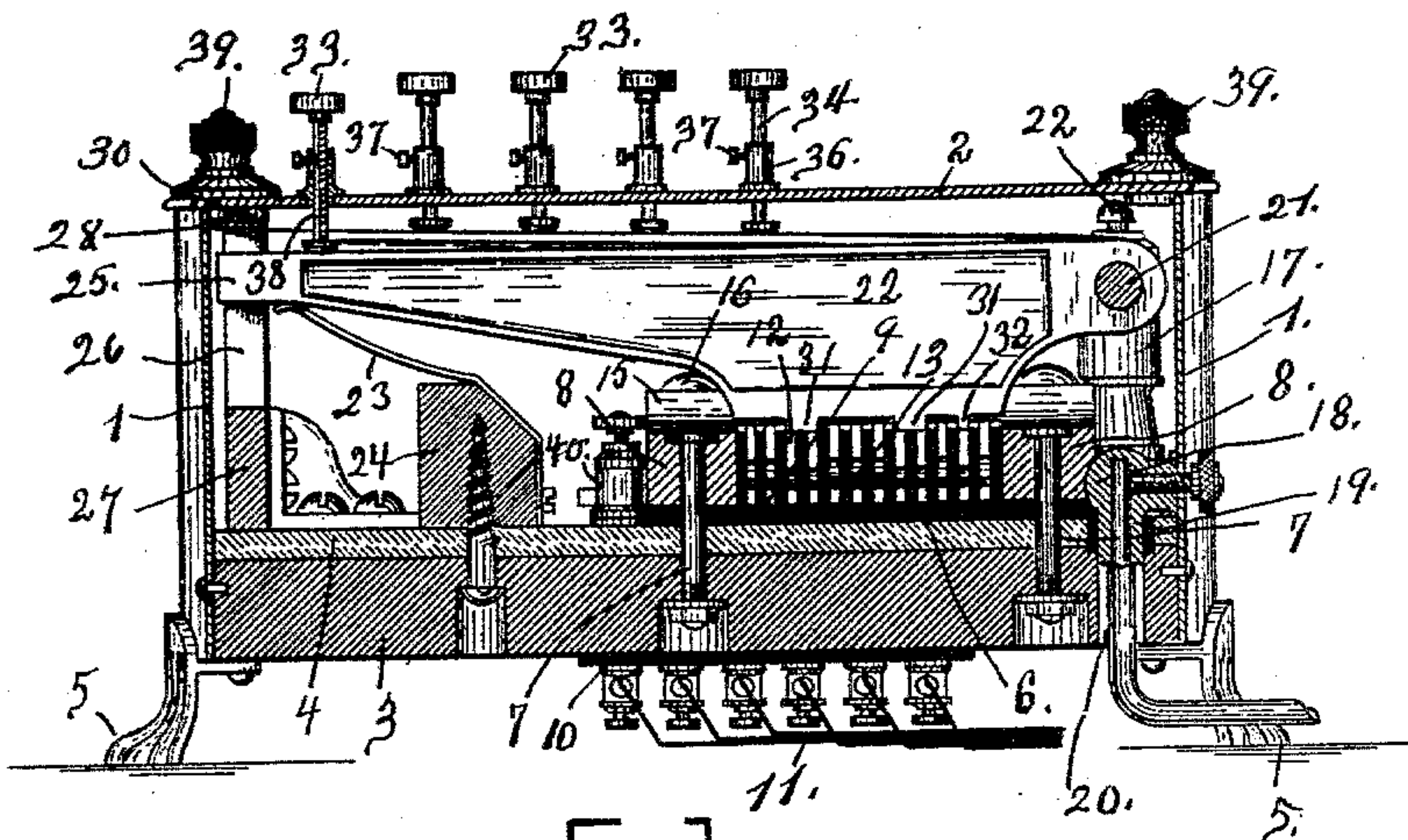


Fig. 3.

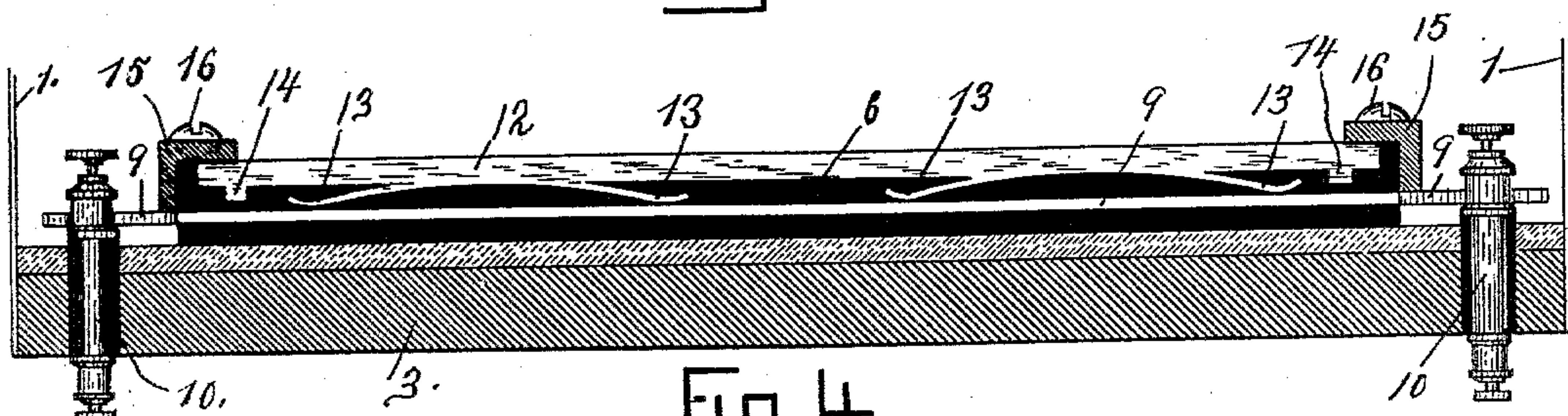


Fig. 4.

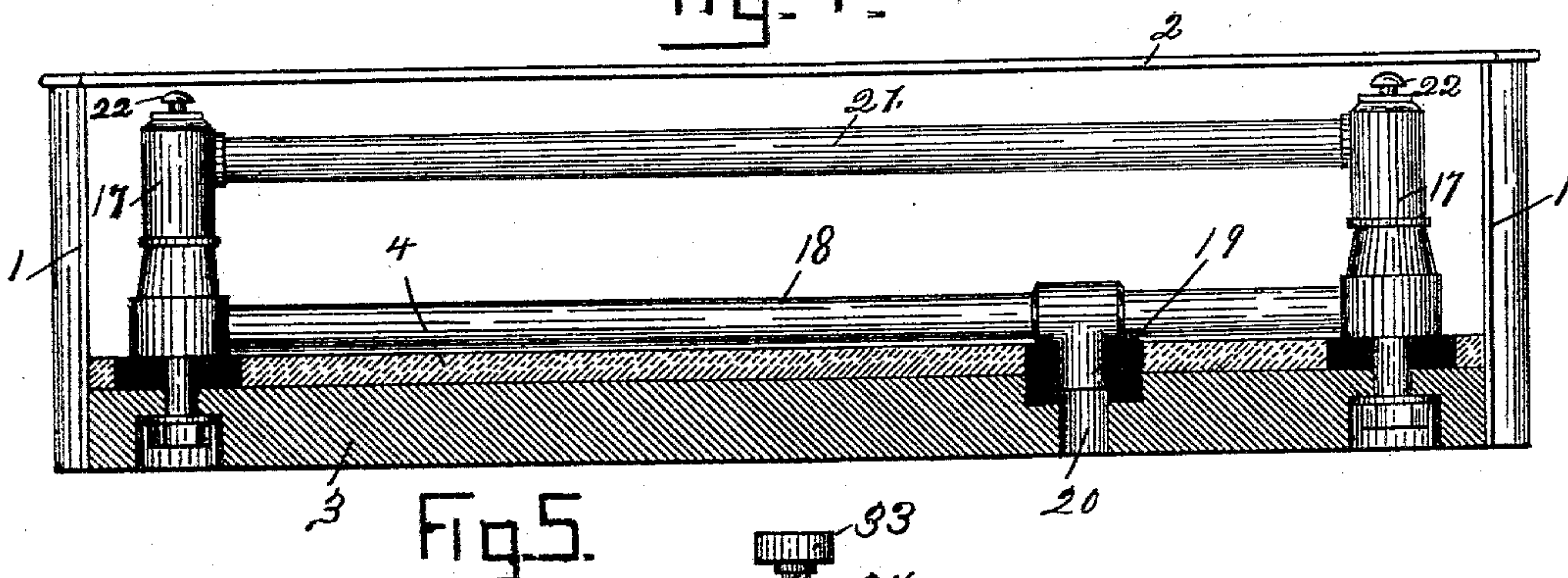


Fig. 5.

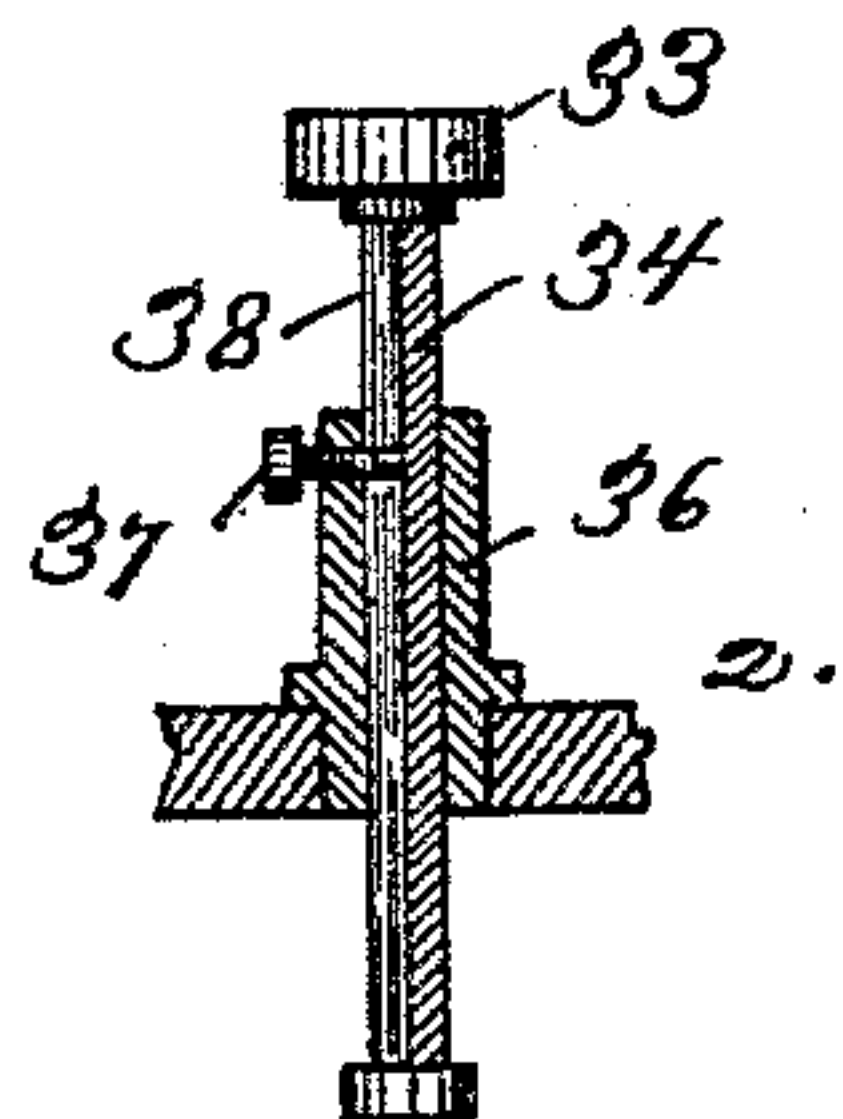


Fig. 6.

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(No Model.)

4 Sheets—Sheet 3.

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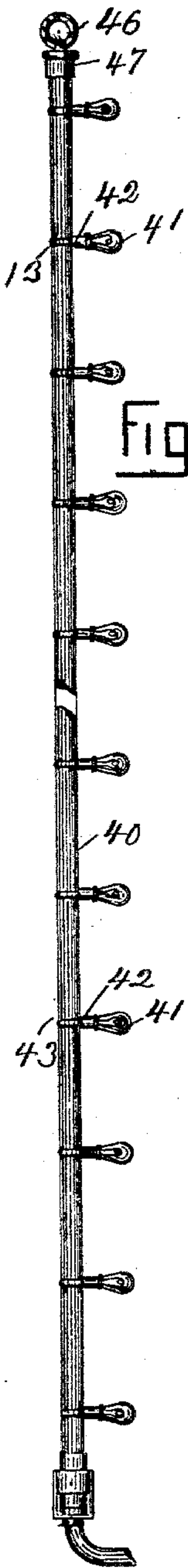


Fig. 7.

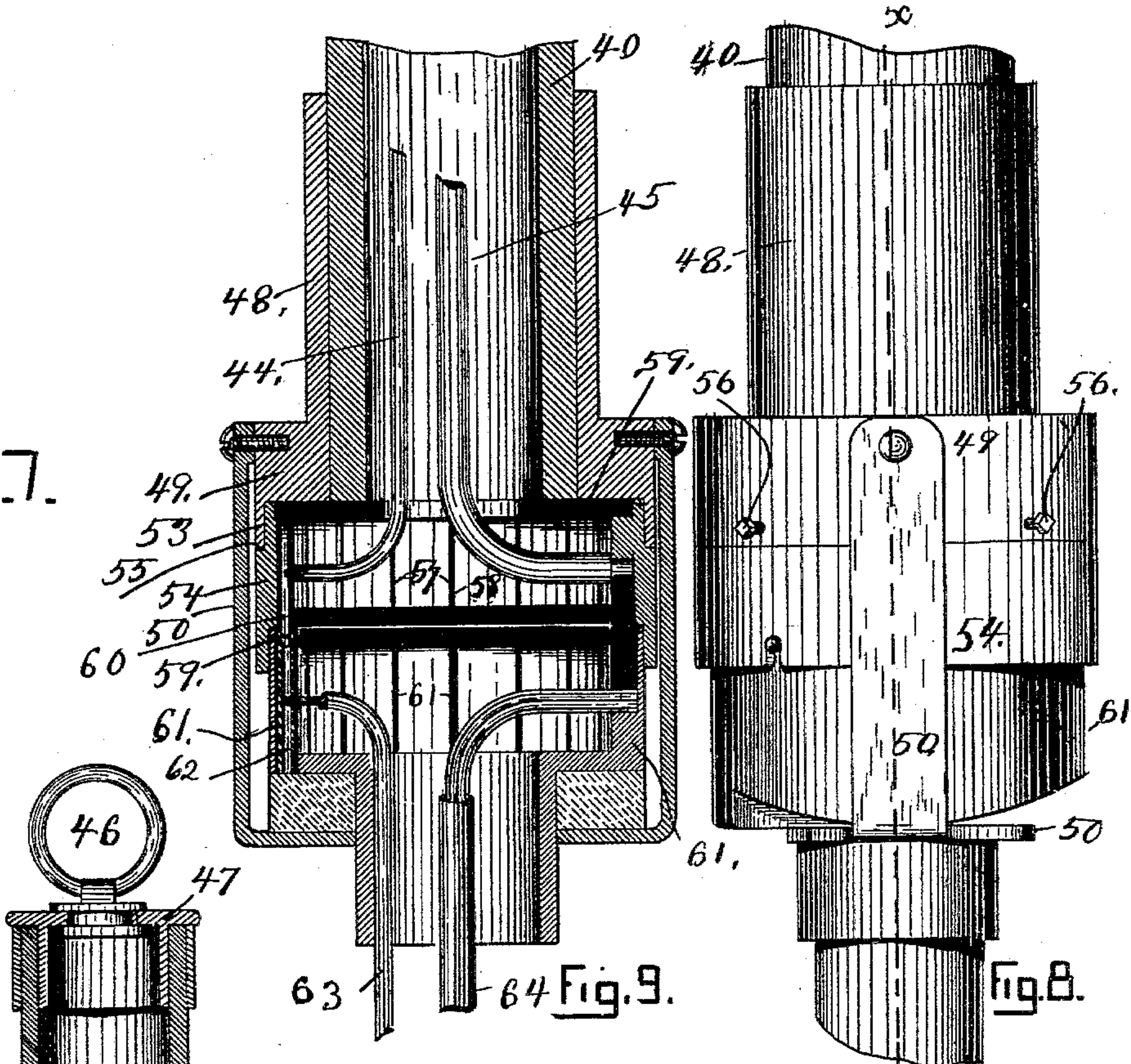


Fig. 9.

Fig. 8.

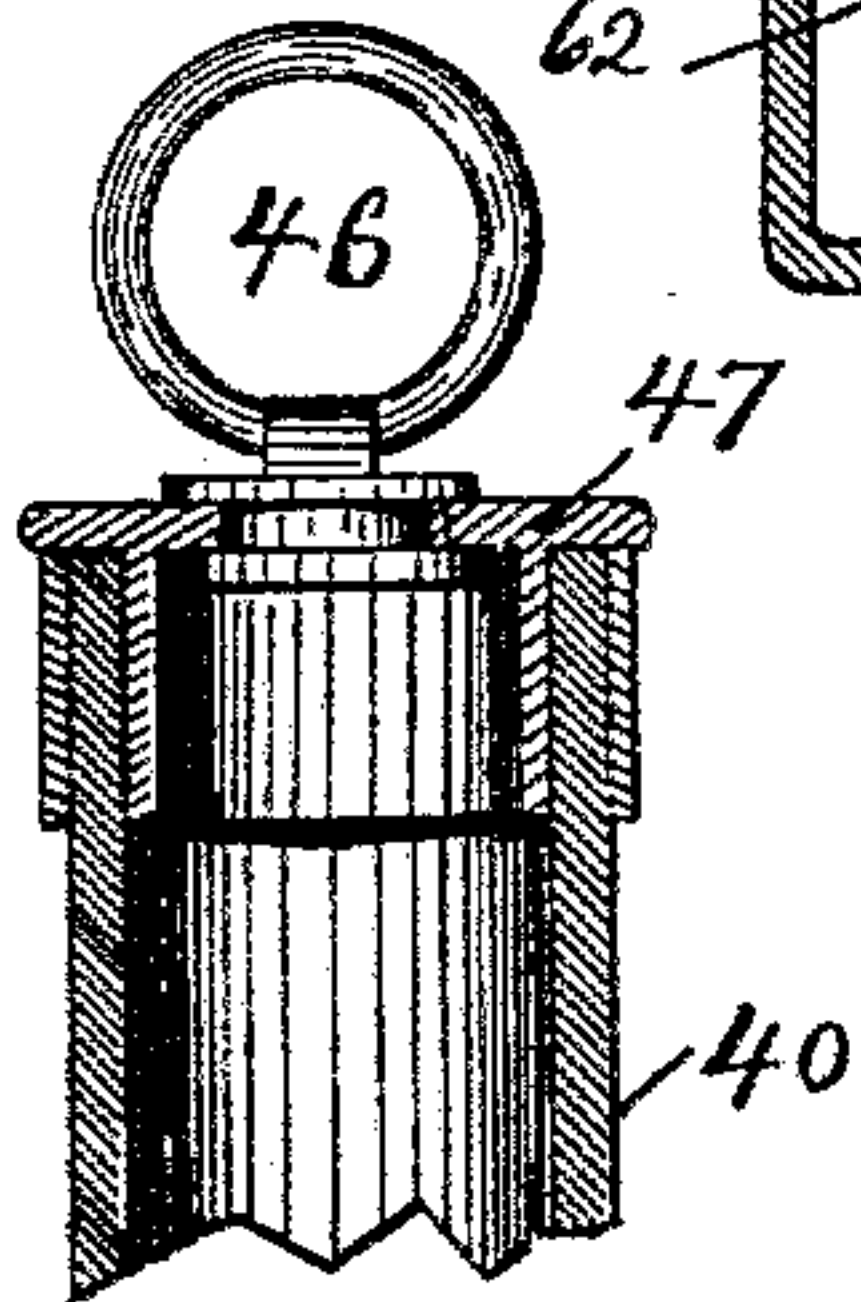


Fig. 12.

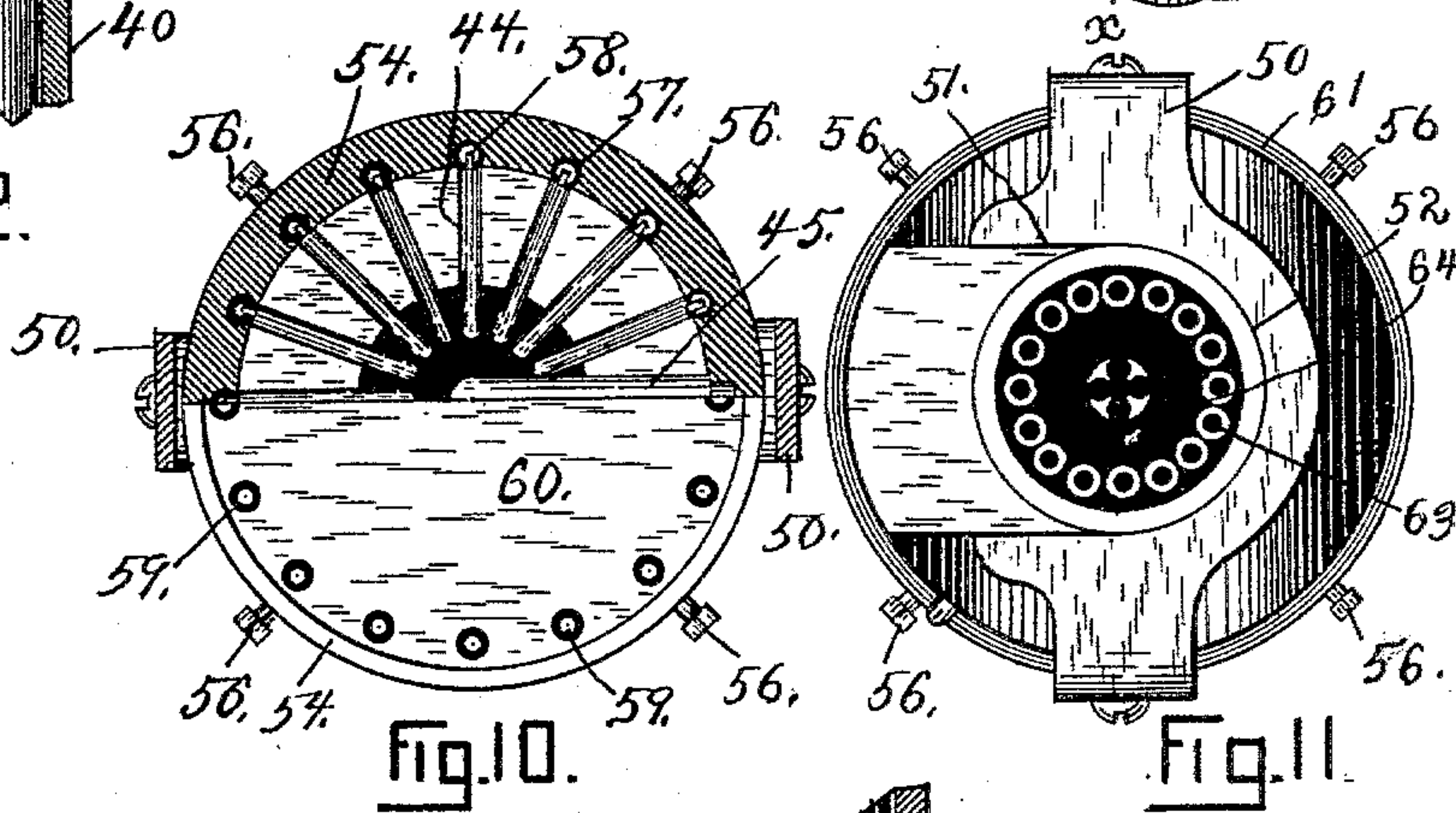


Fig. 10.

Fig. 11.

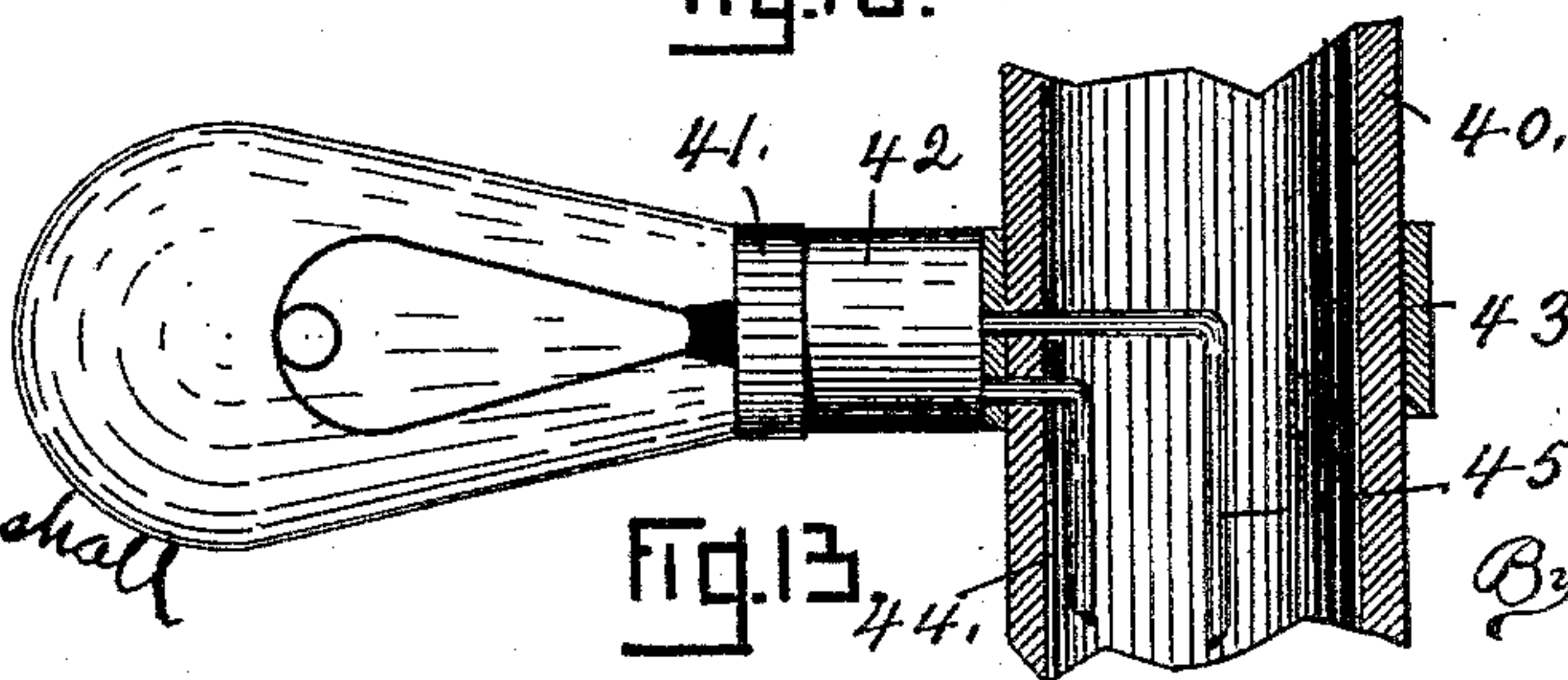


Fig. 13.

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Inventor:  
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By W. T. Miller  
Attorney.



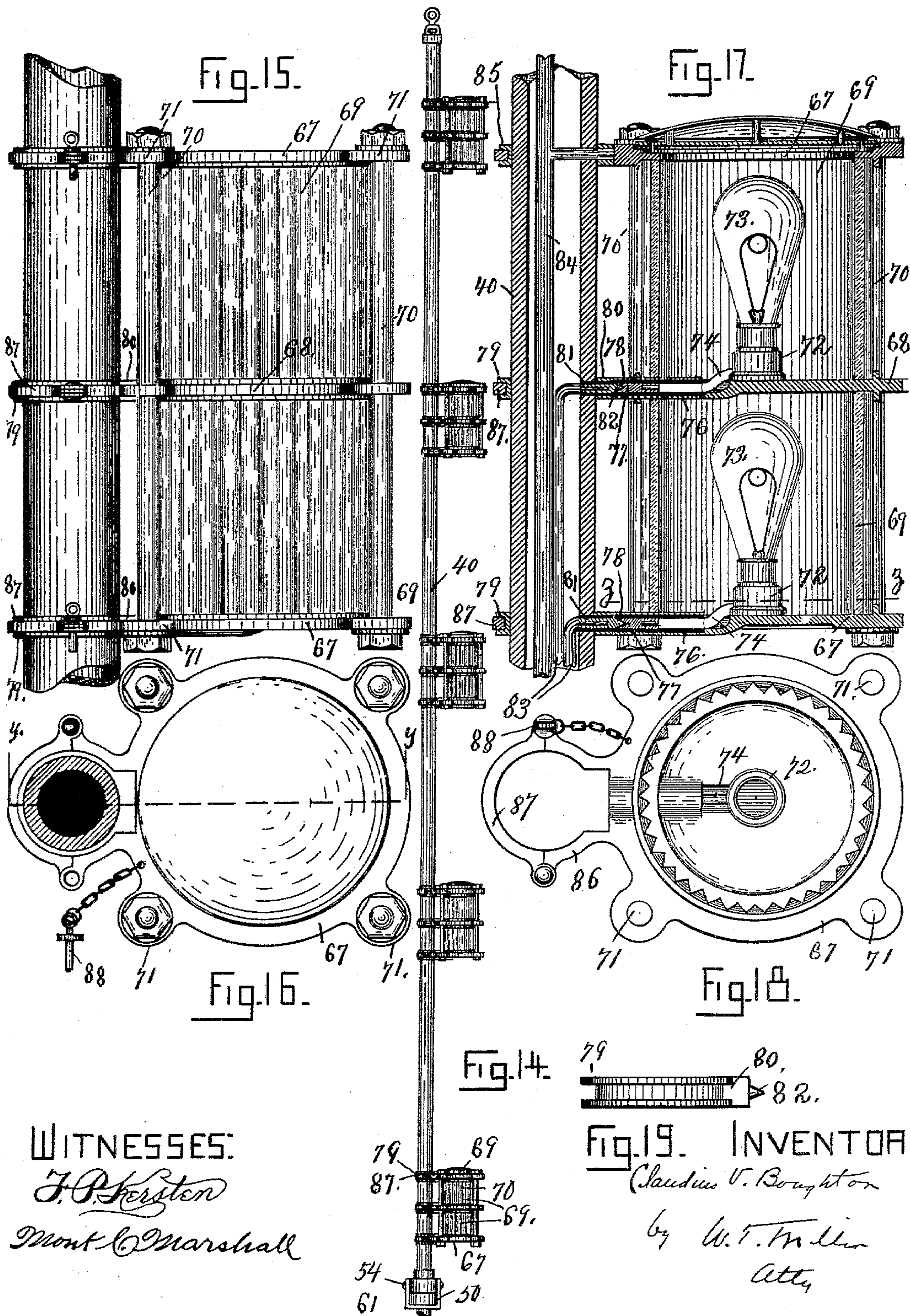
(No Model.)

4 Sheets—Sheet 4.

C. V. BOUGHTON.  
SIGNAL TELEGRAPH.

No. 597,536.

Patented Jan. 18, 1898.





# UNITED STATES PATENT OFFICE.

CLAUDIUS V. BOUGHTON, OF BUFFALO, NEW YORK.

## SIGNAL-TELEGRAPH.

SPECIFICATION forming part of Letters Patent No. 597,536, dated January 18, 1898.

Application filed December 19, 1895. Serial No. 572,632. (No model.)

*To all whom it may concern:*

Be it known that I, CLAUDIUS V. BOUGHTON, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in Signal Telegraphy; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in "signal telegraphy," and more particularly to the apparatus covered by Letters Patent No. 509,290, granted November 21, 1893, and No. 523,617, granted July 24, 1894.

The apparatus covered both broadly and in detail by the above-named patents consisted of a number of electric lamps arranged in a continuous line, a bed-plate of non-conducting material, a series of spring-pressed metal strips insulated from each other in such bed-plate and each electrically connected with a separate lamp, and spring-pressed contacting plates operated by separate keys to complete the circuits through different groups of the spring-pressed strips to light the lamps necessary to produce the character desired.

The light-shaft employed with the above-outlined keyboard consisted of a rigid shaft in which were secured a number of incandescent lamps arranged closely together in a continuous line. In operation on depressing a certain key electric circuits were established which illuminated lamps in the staff which formed the dots and dashes called for by the letter of the key in operation. A dot was formed by lighting one or two lamps and a dash by lighting from six to twelve contiguous lamps, the spaces being formed by unlighted lamps between the dots and dashes. This form of staff was necessarily bulky in order to secure sufficient rigidity for the length required to carry the necessary number of lamps.

The object of my present invention with respect to the light-shaft is twofold: first, to provide a shaft much lighter in weight and flexible to adapt it for easy and quick ma-

nipulation when being placed in position or taken down and stored away; second, in an arrangement of two series of lamps of different colors secured alternately upon the flexible shaft, the lamps of one color representing dots and the lamps of the other color representing dashes to be employed with my special construction of keyboard above outlined in order to reduce to a minimum the number of lamps and connecting-wires and the number of operative parts in the keyboard required for the purpose, the whole constituting a much more simple and effective apparatus for signal telegraphy with respect to the nature of the shaft, the number of lamps employed thereon, and the number of operative parts required in the keyboard.

Another object of my invention is the specific improvement of the keyboard with respect to the detailed arrangement of the operative parts and their casing, principally to facilitate easy and rapid access to the interior for the purpose of repairing and renewal of parts.

To these ends my invention consists, first, in a signal-telegraph consisting, essentially, of two series of lamps of different colors secured alternately upon a shaft, the lamps of one color representing dots and the lamps of the other color representing dashes, a bed-plate of non-conducting material, a series of metal strips insulated from each other in such bed-plate and each electrically connected with a separate lamp, and spring-pressed contacting plates operated by separate keys to complete the circuits through different groups of the metal strips to light the lamps necessary to produce the character desired; second, in a signal-telegraph consisting, essentially, of two series of lamps of different colors secured alternately upon a flexible shaft, the lamps of one color representing dots and the lamps of the other color representing dashes, a bed-plate of non-conducting material, a series of spring-pressed metal strips insulated from each other in such bed-plate and each electrically connected with a separate lamp and spring-pressed contacting plates operated by separate keys to complete the circuit through different groups of the spring-pressed metal strips to light the lamps necessary to produce the



character desired; third, in a signal - telegraph a flexible light-shaft upon which are removably connected at intervals a series of electric lamps, the light-shaft being provided at its lower end with an electric coupling for removably attaching it to the keyboard; fourth, in certain improved details of construction in the keyboard and its casing, all of which will be more fully herein-  
 10 after described and claimed.

In the drawings, Figure 1 is a top plan view of my improved keyboard inclosed in its casing. Fig. 2 is a similar view with the cover of the casing removed to show operative parts.  
 15 Fig. 3 is a vertical transverse section of the keyboard. Fig. 4 is a vertical section of the bottom of the casing and the bed-plate of non-conducting material, showing arrangement of metal strips therein. Fig. 5 is a vertical section of casing, showing the rail upon which contacting plates are pivoted. Fig. 6 is a detached section detail view showing manner of connecting keys to the cover of the casing. Fig. 7 is an elevation of my improved hollow flexible light-shaft with single  
 20 lamps attached. Fig. 8 is an enlarged side elevation of the electric coupling of the light-shaft. Fig. 9 is a central vertical section of the same in the line *xx* of Fig. 8. Figs. 10 and 11 are interior views of the coupling shown in Figs. 8 and 9. Fig. 12 is a sectional view of the upper end of the hollow flexible shaft with attached swiveled ring. Fig. 13 shows in section the interior connection of  
 25 the wires with the lamps. Fig. 14 is an elevation of my improved hollow flexible light-shaft, showing the connection thereto of a series of double lamps inclosed in cylindrical casings. Fig. 15 is an enlarged detached elevation of the double lamp attached to hollow shaft. Fig. 16 is a top plan view of Fig. 15. Fig. 17 is a central vertical section through the double lamp and hollow shaft, taken in the line *yy* of Fig. 16. Fig. 18 is a horizontal  
 30 section of Fig. 17, taken in the line *zz*; and Fig. 19 is a side view of the recessed metal bar 1 rigidly secured to the shaft and to which the lamps are removably attached.

Referring to the figures of the drawings  
 50 from 1 to 6, inclusive, which illustrate the construction of the keyboard, 1 1 are the metallic side walls of the casing, 2 the removable metallic cover, and 3 the bottom, of wood, upon the upper surface of which is secured  
 55 the metal facing 4, preferably of aluminium. The preferred dimensions of the casing are thirteen inches in length, eight inches in depth, and four inches in height, within which all the operative parts are compactly arranged. The legs 5 raise the casing about  
 60 one inch from the surface upon which it is to be secured by fastening-screws.

6 is the bed-plate, of hard rubber or other non-conducting material, which extends  
 65 nearly the entire length of the casing, in the back portion thereof, and rests upon the aluminium facing 4, being secured thereto by

the bolts 7, which pass down through the metal bars 8, which rest in shoulders in the bed-plate 6 across the front and rear of the same and also down through the facing 4 and bottom 3 of the casing, the nuts which removably engage their lower ends being counter in the bottom 3. In a series of longitudinal recesses in the bed-plate 6 are arranged  
 70 the thin unyielding strips 9, which rest on the floors of such recesses, their ends projecting alternately from the ends of the bed-plate 6 and connecting with the binding-posts 10, which pass down through insulated sockets  
 80 in the facing 4 and bottom 3, their lower projecting ends underneath the casing being connected to separate wires 11, which lead to the separate lamps upon the staff. A series of spring-pressed strips 12, with the springs 13  
 85 upon their lower edge, rests upon the strips 9 in the bottom of the recesses, these strips 12 having the bearing projections 14 at each end thereof. The angular keepers 15, extending across the ends of the spring-pressed strips  
 90 12, serve to retain them loosely in their recesses. These keepers 15 are removably secured by the screws 16, which engage with the metal bars 8 at their ends.

17 17 are two posts secured in and insulated  
 95 from the facing 4 and bottom 3 of the casing. 18 is a cross-bar connecting the lower ends of these posts and having a sliding extension 19 passing down into an insulated aperture 20 in the bottom of the casing, in which a connection is made with a wire through which the return-current passes. 21 is another cross-bar connecting the upper ends of the posts 17 17. This cross-bar is removably secured in sockets in the bars 17 17 by the  
 105 screws 22'. Upon this upper cross-bar are pivoted a series of levers 22, which extend transversely across the casings, each resting upon one of a series of leaf-springs 23, secured at intervals across the rail 24, rigid with the facing 4. The forward ends 25 of the levers 22 have a vertical play within the recesses 26 in the plate 27, extending across the front of the casing. A cross-strip 28, with open slots 29, adapted for removable engagement with the shanks of the screw-posts 30, prevents the levers 22 from riding out of their vertical slots 26.

Each lever 22 has its rear portion extending downward to form a contacting portion or surface which is to be pressed against certain of the spring-pressed strips 12 to complete the circuit with certain lamps of the shaft electrically connected with these strips. For instance, the lever shown in Fig. 3 has the two  
 125 contacting surfaces 31 31, each of which strikes two of the strips 12, and the contacting surface 32, which strikes one only of the strips. Each of the levers 22 is depressed by a separate key 33, marked by a letter of the alphabet or a numeral. These keys each have a shank 34, with a button 35 at its lower end for contact with its lever 22. The shank 34 is reciprocated vertically in a socket 36, rigid



upon the cover 2, and is prevented from turning in its socket by a screw 37, which passes through the wall of the socket and extends loosely within a vertical groove 38 in the shank. (See Figs. 3 and 6.) With this improved arrangement the keys are a part of the removable cover, and when the cover is removed for access to the interior of the casing the keys are carried with it, which is a great improvement over my former construction, in which the keys passed down through the cover and engaged with the pivoted levers inside the casing, which involved their separate disconnection before the cover could be removed.

One of the most desirable features in an apparatus of this nature is quick and easy access to the interior for the purpose of renewal and repair of parts. My improvements have been made partly with this end in view, as will be readily seen, for to gain access, for instance, to the spring-pressed strips 12 the screws 39, which secure the cover 2 in position, are removed and the cover and attached keys 33 are all taken off together. The strip 28, with its open slots 29, is next slipped off, which permits the levers 22 to be quickly raised out of the vertical slots 26 and swung over upon their rod 21 until they rest outside of the casing. In this manner complete access is obtained to the strips 12, which can in turn be quickly taken out by removing the keepers 15 15 from the bed-plate, which leaves the under strips 9 free to be detached from their binding-screws 10 upon each side of the casing. If therefore any breakage or mutilation of parts should occur, it would only be a matter of a few moments to effect necessary repairs or replacement of parts. Then, too, with the substitution of a red light for a series of white lights, as in my former patents, to produce a dash, I am enabled to reduce the number of operative parts to a minimum, thereby reducing the size, weight, and cost of the keyboard correspondingly.

Referring to Figs. 7 to 13, inclusive, which illustrate the construction of one form of my improved light-shaft, 40 is the flexible shaft, which is preferably hollow, being formed from rubber hose or tubing of three or more ply. The wires connecting the incandescent lamps 41 pass through the interior of the shaft and into the sockets 42, forming a rigid part of the metal bands 43, secured at intervals in the length of the shaft, the lamps being removably secured in the sockets.

44 are the individual wires leading from the strips 9 in the keyboard separately to sockets 42, and 45 is the return-wire connected with each of the sockets 42 and to the extension 19 upon the cross-bar 18 in the keyboard. The upper end of the hollow flexible shaft has connected thereto the swiveled ring 46, turning in a socket 47, secured to the shaft. The lower end of the flexible shaft is provided with a detachable coupling to connect it with the cable of wires leading from the keyboard,

of which 48 is a metallic collar in which the end of the flexible staff is secured. The lower end of this collar 48 has the annular enlargement 49, to which is pivoted the yoke 50, provided upon its lower cross-piece with the open slot 51, with the semicircular inner end 52. The annular enlargement 49 is provided with the depending annular flange 53.

54 is a ring provided with the upper annular shoulder 55, adapted for the removable reception of the annular flange 53 upon the collar 48, it being removably held in such position by the set-screws 56. The inner surface of the ring 54 is provided at intervals with longitudinal recesses 57, into which are set insulated wires 58, their upper ends abutting against a washer 59', of insulating material. The individual wires 44, leading from the lamps, are extended down and their stripped ends are brought into contact with the wires 58 in the ring 54, the lower stripped ends 59 projecting down a short distance below the disk 60, of insulating material.

The return wire or cable 45 has its lower end inserted in the wall of the ring 54. A similar ring 61, adapted for insertion in the lower interiorly-shouldered end of ring 54, is provided with a series of insulated hollow metal tubes 62, arranged in the inner wall of the ring 61 in a manner similar to the insulated wires 58 in the ring 54.

The individual wires 63, leading to the strips 9 in the keyboard, have their stripped ends inserted in the tubes 62, and the return wire or cable 64, leading from the projection 19 in the keyboard, is connected with the ring 61 in a manner similar to the return-wire 45.

When the two rings 54 and 61 are coupled together and held in such position by the hinged yoke 50, the projecting ends 59 of the wires 58 in the ring 54 are forced into the open ends of the insulated tubes 62 in the ring 61, which completes the contact of the individual and return wires from the lamps with the corresponding individual and return wires from the keyboard. In this manner my improved flexible light-shaft can be instantly coupled or uncoupled with the keyboard, the electrical connections being simultaneously effected. When not in use, the light-shaft can be detached and lowered from its position, the lamps removed, and the staff coiled up and stowed away. The wires and their connections being concealed within the hollow staff are perfectly protected from accidental injury and exposure to the weather, and the staff, being light, can be easily and quickly handled.

In Figs. 15 to 19, inclusive, I have illustrated a modified form of flexible light-shaft adapted for the removable reception of double lamps inclosed within glass shades or lenses. The flexible light-shaft 40 and coupling 54 61 are identical with those shown in Figs. 7 to 13, inclusive, the form of the lamps and the manner of their connection to the shaft 40 being different.



67 67 are the top and bottom metal rings, and 68 the intermediate metal ring, between which the two cylindrical glass shades or lenses 69 are held by means of the tie-rods 70, which pass through the apertured lugs 71. The intermediate ring 68 and the lower ring 67 are provided with the central sockets 72 for the removable reception of the incandescent lamps 73. The feed-wire 74 passes from the sockets 72 into the horizontal sockets 76, lined with insulating material, and contacts with the insulated plug 77, the outer end of which has a conical recess 78. Upon the flexible staff 40 are secured recessed metal rings 79, and upon one side of each is a rectangular projection 80, in which is secured an insulated plug 81 with an outwardly-projecting conical end 82, its inner end extending to the interior of the flexible staff. To these inner ends are secured the ends of the individual wires 83, leading to the keyboard. The return-wire 84 passes through the upper ring 85 into electrical contact with the upper ring 67 of the lamp-frame. By this arrangement the return-current from each lamp is led by the socket 72 into the metallic frame holding the shades and thence to the upper ring 67 and through the coupling there into the main return-wire 84 within the shaft 40.

Each of the rings 67, 67, and 68 is provided with a sectional locking-band, of which 86 is the portion rigid with the rings 67, 67, and 68, adapted for the reception of one-half of recessed ring 79 and its rectangular projection, the other portion 87 being semicircular and hinged at one end to the part 86, its other end being removably secured by the locking-pin 88. It will be seen that the double lamps constructed as shown can be quickly secured in position or disengaged from the staff, the electrical connections being simultaneously made or broken, as when they are attached the conical projections 82 enter the conical recesses 78, thus instantly effecting the electrical connection between the lamps and wires.

The lamps 41 upon the shaft (shown in Fig. 7) are of two colors, preferably white and red, arranged alternately, the white lamps representing dots and the red lamps dashes. With this arrangement I am enabled to represent all of the letters of the alphabet and the numerals in the necessary dots and dashes with eleven lamps, using a twelfth lamp of a different color for the period. In the double lamps (shown in Fig. 17) one is a red and the other a white light.

The operation of my improved keyboard is substantially the same as the operation of those shown in my former patents herein named. On depressing one of the keys 33 the button at the lower end of the shank 34 strikes the lever 22 immediately underneath and pushes it down against the action of the leaf-spring 23. The surfaces 31, 31, and 32 contact with certain of the spring-pressed strips 12, thus completing the circuit between

these strips and their attached lamps, representing in lighted lamps on the staff the dots and dashes called for by the letter of the key in operation. On removing the pressure upon the key the levers are forced up by the springs 23, the contacting surfaces 31, 31, and 32 are lifted from the strips 12, the circuit is broken, and the lamps are extinguished.

The flexible shaft could, if desired, be made solid instead of hollow, in which case the feed and return wires would be embedded therein.

I claim—

1. In a signal-telegraph, the combination with a flexible light-shaft having incandescent lamps thereon, separate feed-wires for such lamps, and a common return-wire, all passing through the shaft; of a coupling carrying wires adapted for connection with those in the shaft, devices in the coupling for making such connection automatically, and a yoke pivoted to one member of the coupling and engaging the other when the members are assembled, as and for the purpose set forth.

2. In a signal-telegraph, the combination with the bed-plate of insulating material having recesses in its upper face, fixed strips seated therein, and electric connections leading therefrom; of movable contact-strips also standing within the recesses and having springs between them and the fixed strips, and removable angular keepers extending over the extremities of the contact-plates, as and for the purpose set forth.

3. A keyboard for signal-telegraphs consisting essentially of a casing inclosing the contacting strips and plates, one set of which is mounted on spring-pressed levers, a cover for said casing, screws holding it removably in position thereon, and keys sliding through the cover at points to bear upon their respective levers and yet removable with the cover, as and for the purpose set forth.

4. A keyboard for signal-telegraphs consisting essentially of a casing inclosing the contacting strips and plates, one set of which is mounted on spring-pressed levers, a removable cover for said casing having sockets through its body with screws in their sides, keys having shanks sliding through said sockets and grooved to receive the tips of the screws, and buttons at the lower ends of the shanks adapted to rest upon their respective levers when the cover is in position, as and for the purpose set forth.

5. A keyboard for signal-telegraphs consisting essentially of a bed-plate of non-conducting material, a series of metal strips insulated from each other in such bed-plate, spring-pressed contacting plates or levers to complete the circuits through different groups of the metal strips and keys in the cover of the casing for operating the contacting plates or levers such keys being separable with the removable cover, from such plates or levers as and for the purpose stated.

6. A keyboard for signal-telegraphs consisting essentially of a bed-plate of non-conduct-



ing material, a series of spring-pressed metal strips insulated from each other in such bed-plate, a series of fixed metal strips also insulated in such bed-plate and in contact with the spring-pressed metal strips, and spring-pressed contacting plates or levers operated by separate keys to complete the circuits through different groups of the two series of metal strips.

7. A keyboard for signal-telegraphs consisting essentially of a bed-plate of non-conducting material, a series of spring-pressed metal strips insulated from each other in such bed-plate, a series of fixed metal strips also insulated in such bed-plate and in contact with the spring-pressed strips, spring-pressed contacting plates or levers to complete the circuits through different groups of the two series of metal strips and keys in the cover of the casing for operating the contacting plates or levers, such keys being separable with the removable cover, from such plates or levers, as and for the purpose stated.

8. In a signal-telegraph the combination with the removable cover 2 and the keys 33 vertically movable therein, of the levers 22, pivoted upon the cross-rod 21, the springs 23, the slotted plate 26, 27, and the removable strip 28 with the open slots 29 all combined and operating as and for the purpose stated.

9. The herein-described electric coupling comprising a shaft in two parts, one return and several individual wires therein; on one part a collar 48 having an annular enlargement 49 provided with a flange 53, a ring 54 having a shoulder 55 receiving said flange, set-screws 56 through the flange against the ring, the return-wire 45 being electrically connected with said ring, and a series of wires 58 carried by but insulated from the ring and connected with the individual wires 44; and on the other part a similar ring 61 fitting the open end of the first ring, also electrically connected with its own return-wire, and carrying a series of members 62 connected with its own individual wires 63 and adapted to contact with the wires 58 when the parts of the coupling are assembled, as set forth.

10. The herein-described electric coupling comprising a shaft in two parts, and one return and several feed wires in each; on one part a collar 48 provided with a flange 53, a ring 54 receiving said flange, the return-wire 45 being electrically connected with this ring, and a series of wires 58 carried by but insulated from the ring and connected with the individual wires 44, their lower ends 59 being stripped; and on the other part a similar ring 61 fitting the open end of the first ring, also electrically connected with its return-wire,

and carrying a series of tubes 62 connected with its individual wires 63 and adapted to receive the stripped ends 59 of the wires 58 when the parts of the coupling are assembled, as set forth.

11. In an electric coupling, the combination with one part having an annular enlargement 49, and a ring 54 carried thereby and containing the terminals of the line-wires; of the other part carrying a similar ring 61, a yoke 50 pivoted to the sides of said enlargement and having in its cross-piece an open slot 51 with a semicircular inner end 52 adapted to embrace the second part of the coupling behind its ring, as and for the purpose set forth.

12. In a signal-telegraph, the combination with a light-shaft carrying feed and return wires; of a glass shade, top and bottom rings between which it is held, a locking-band on each ring comprising a portion 86 rigid therewith, a second portion 87 hinged to the first so that they are adapted to surround said light-shaft, and a locking-pin removably connecting them opposite the hinge; an electric lamp within the shade, and connections between the lamp and the wires in the shaft, as and for the purpose set forth.

13. In a signal-telegraph, the combination with a light-shaft carrying feed and return wires, and recessed rings 79 on said shaft, each having a projection 80 containing an insulated plug 81 with a conical outer end 82 and its inner end connected with one wire; of an electric lamp inclosed within a globe, horizontal sockets 76 in the globe-frame, insulated plugs therein with conical recesses 78 in their outer ends, wires 74 leading from the lamp to the plugs, and means for attaching the globe-frame to the light-shaft, as set forth.

14. In a signal-telegraph, the combination with a light-shaft carrying two wires, and recessed rings 79 secured to said shaft, each having a plug 81 insulated through it and connected with one wire; of a glass shade held in a metallic frame, an electric lamp within the shade, a lamp-socket therefor in electrical connection with the frame, sockets in the latter receiving said plugs, an insulated plug in one socket contacting with that on the ring and connected with the lamp, and locking-bands carried by the frame for removable attachment within the recesses of the rings, as and for the purpose set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CLAUDIUS V. BOUGHTON.

Witnesses:

W. T. MILLER,

F. P. KLUSTON.