

No. 720,855.

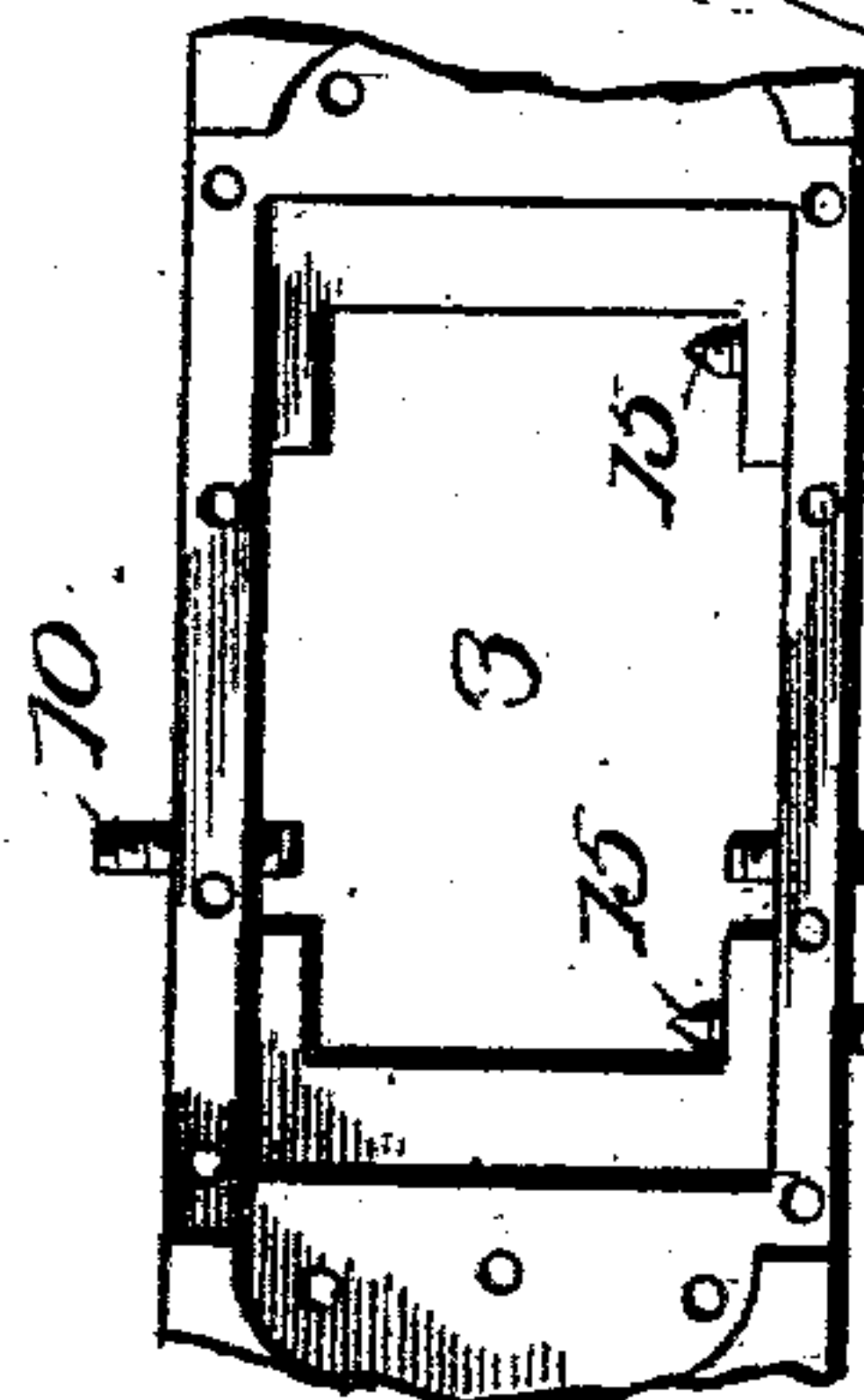
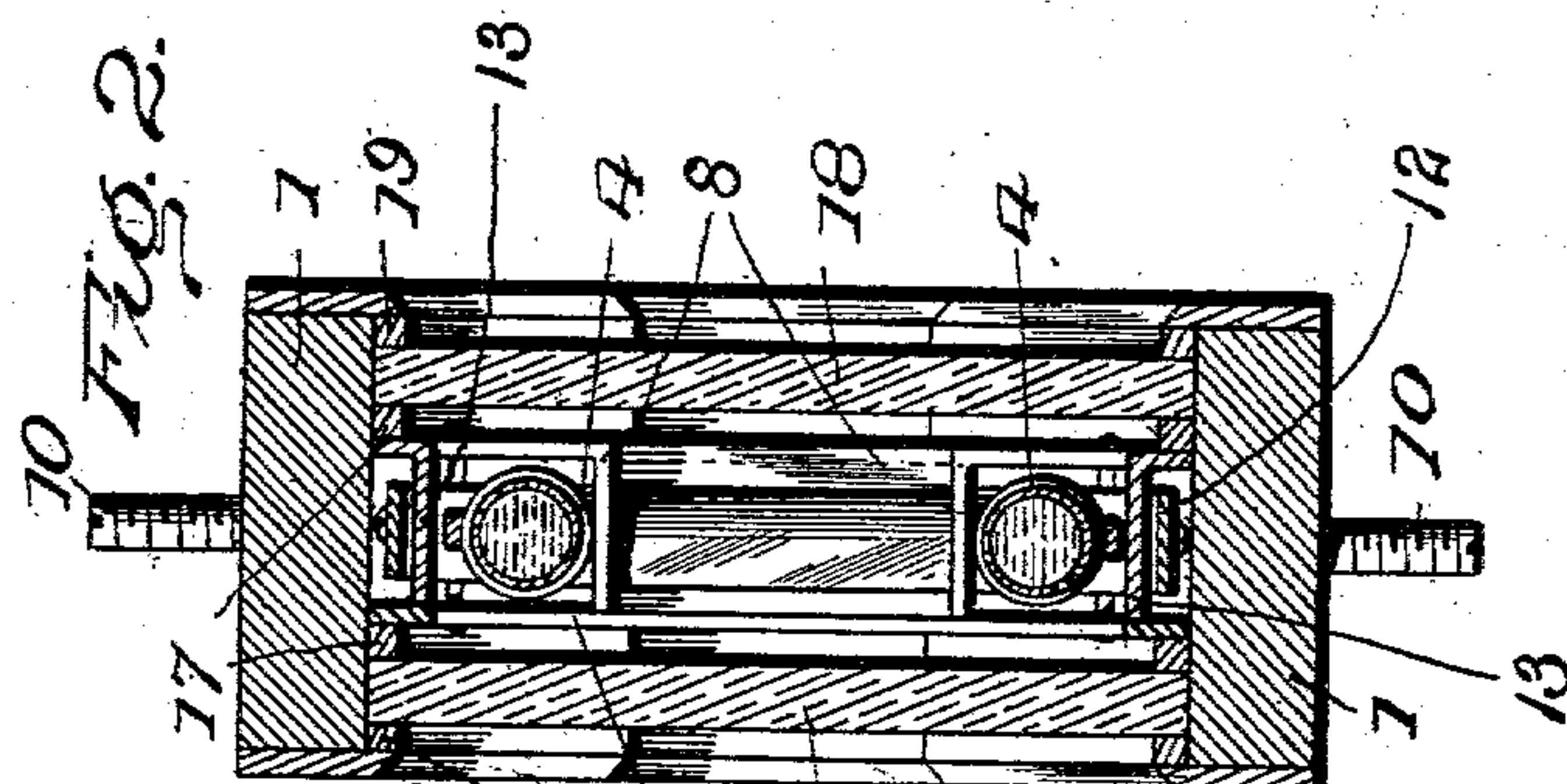
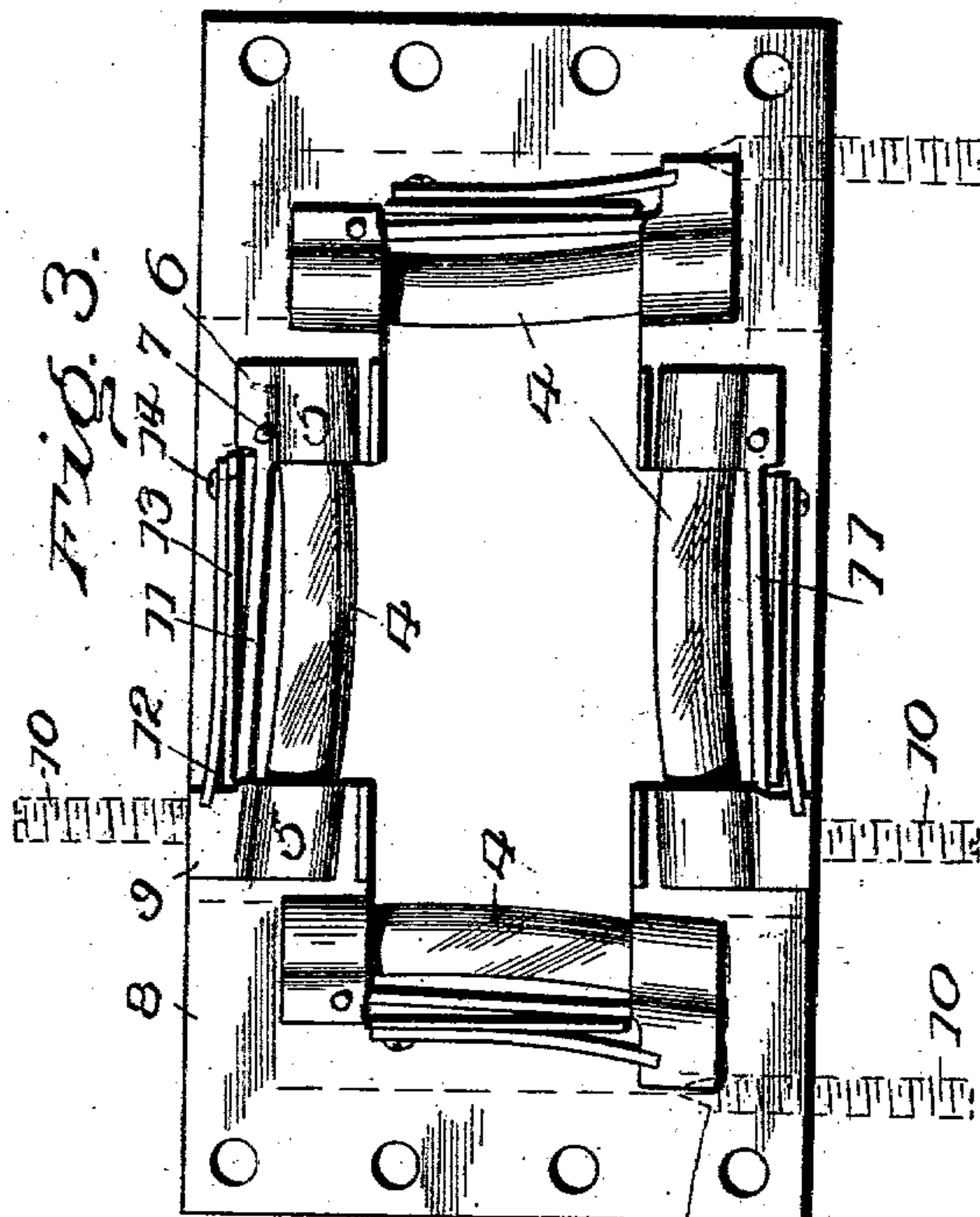
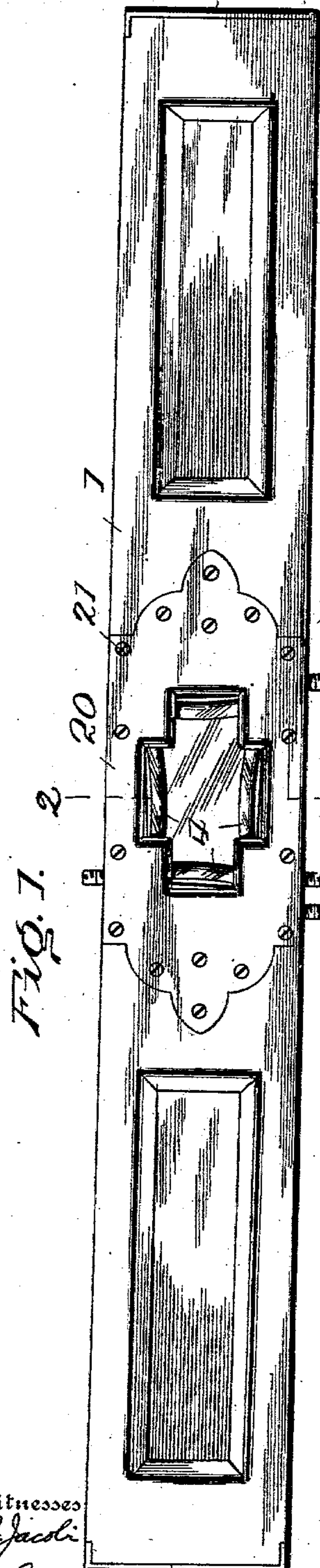
PATENTED FEB. 17, 1903.

E. STOWE.  
SPIRIT LEVEL.

APPLICATION FILED DEC. 30, 1901.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses  
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Attorney



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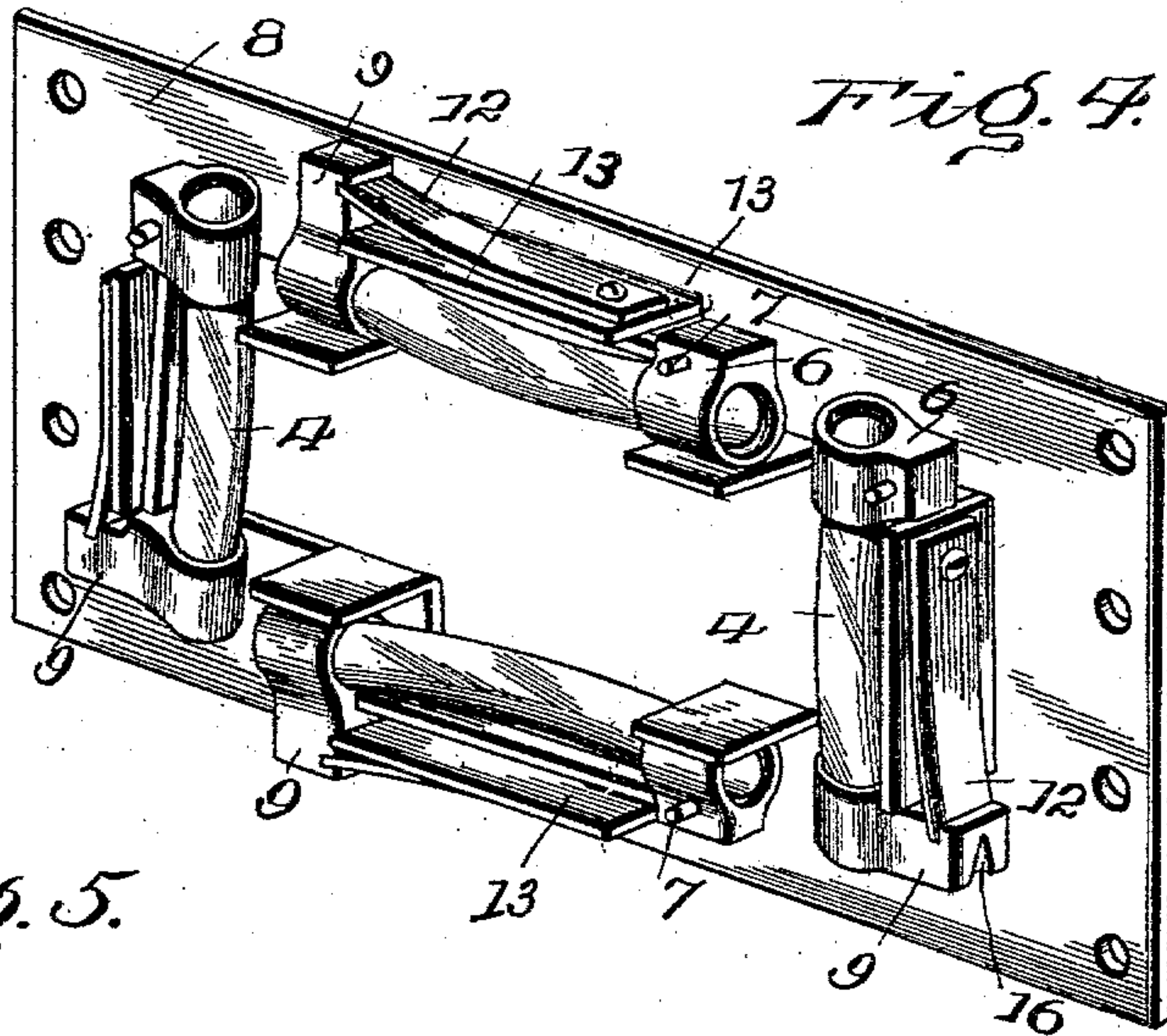


Fig. 5.

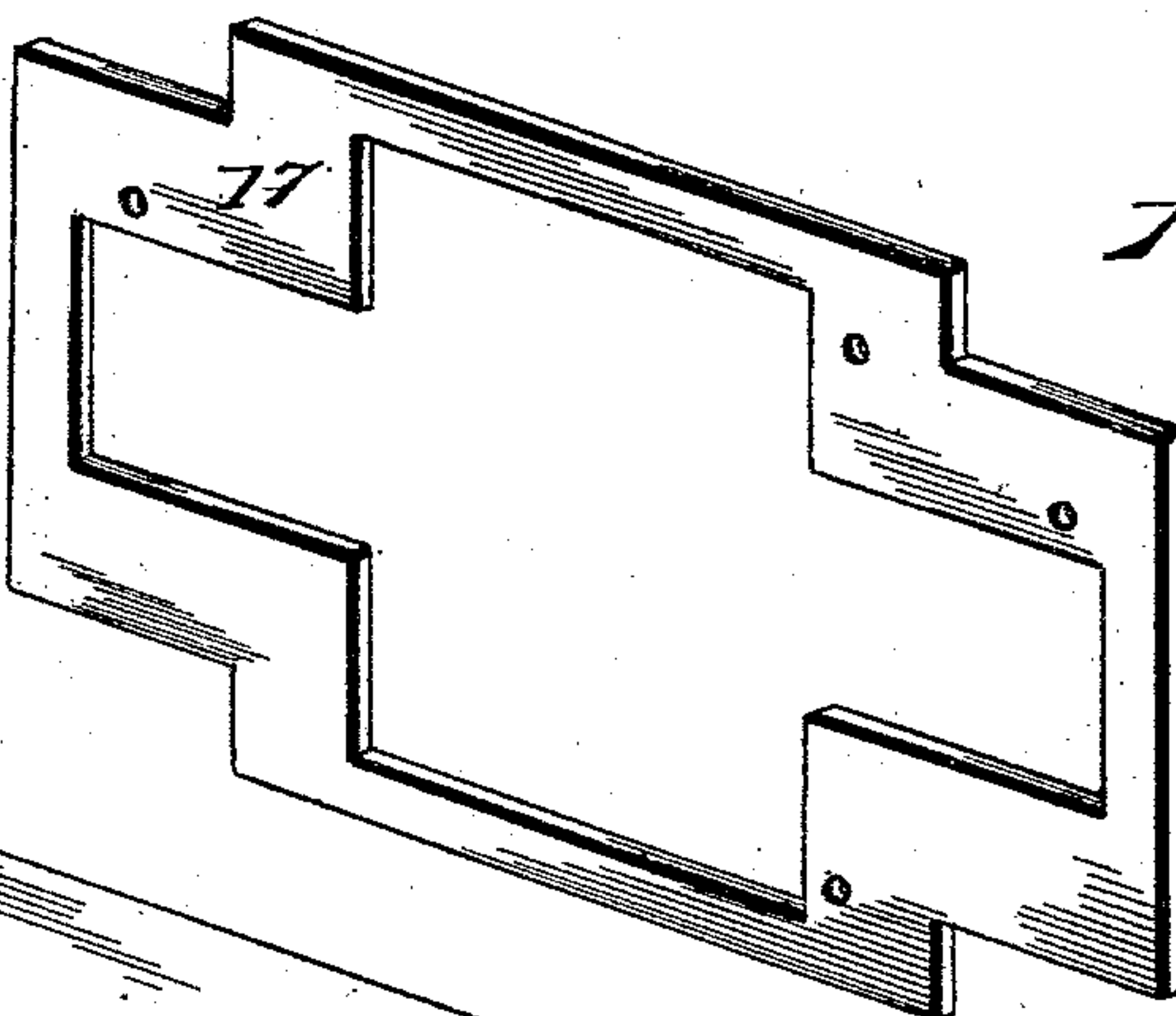
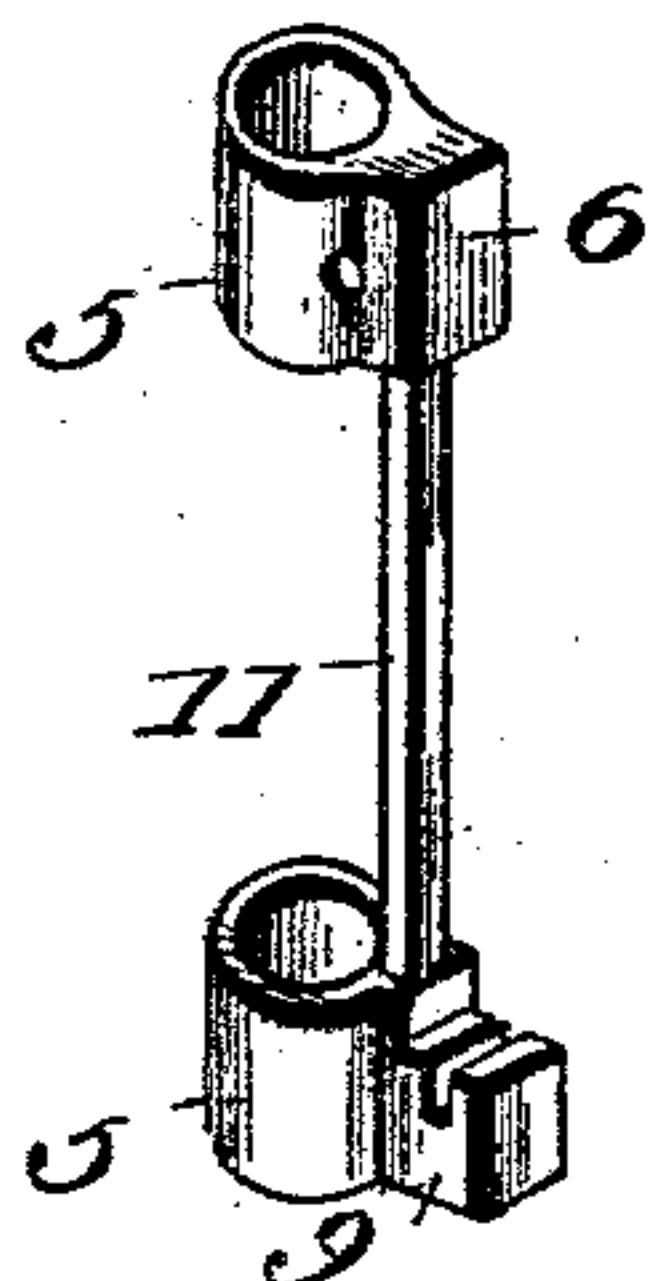


Fig. 6.

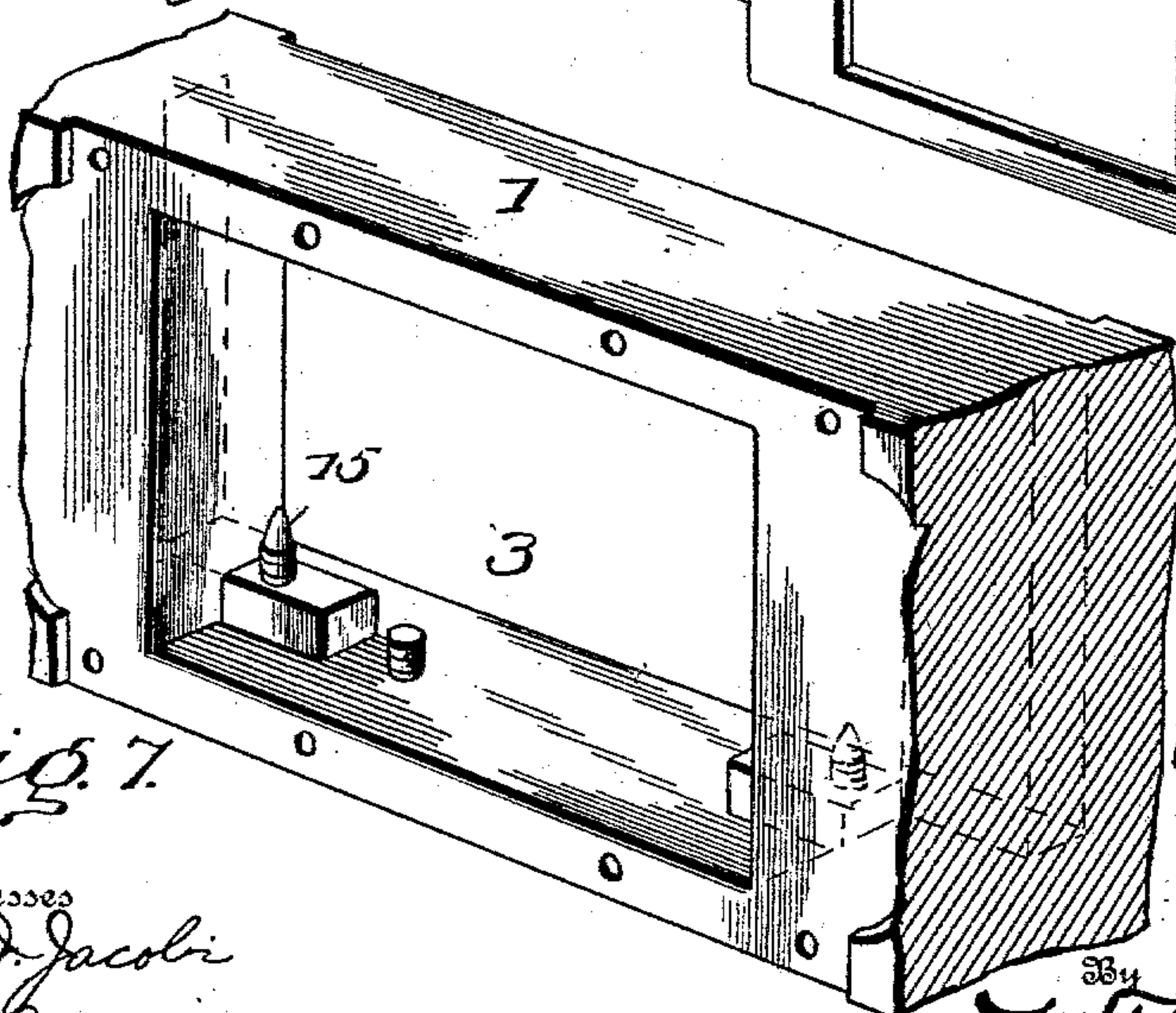


Fig. 7.

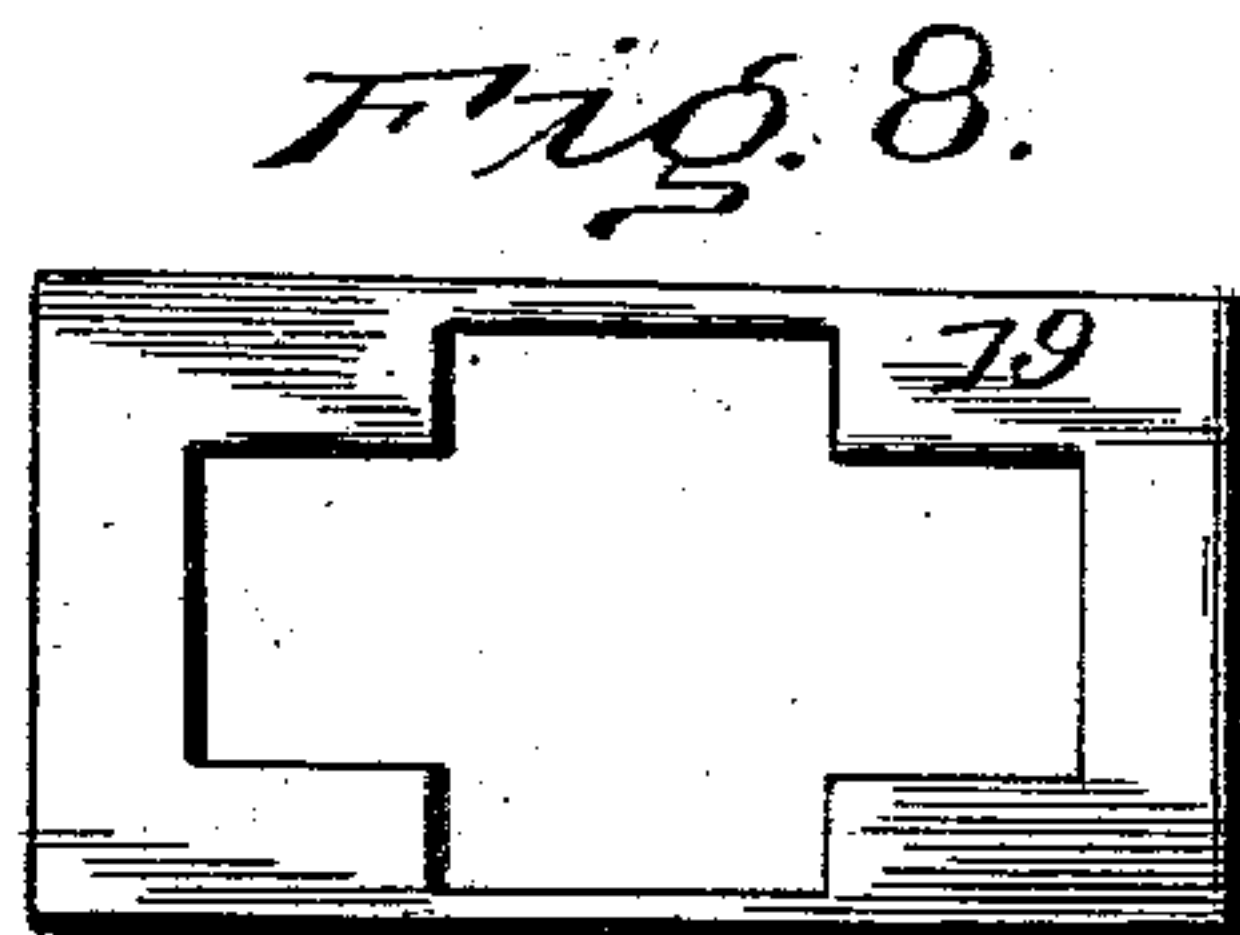


Fig. 8.

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# UNITED STATES PATENT OFFICE.

ERNEST STOWE, OF COREYS, NEW YORK.

## SPIRIT-LEVEL.

SPECIFICATION forming part of Letters Patent No. 720,855, dated February 17, 1903.

Application filed December 30, 1901. Serial No. 87,719. (No model.)

*To all whom it may concern:*

Be it known that I, ERNEST STOWE, a citizen of the United States, residing at Coreys, in the county of Franklin and State of New York, have invented certain new and useful Improvements in Spirit-Levels; 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.

My invention relates to certain new and useful improvements involved in the construction of spirit-levels; and my object is to provide a spirit-level which will be possible of most accurate and sensitive adjustment of parts necessary to determine a true level condition of any object.

A further object is to provide simple, cheap, and reliably efficient means for very quickly restoring the spirit-tube in a true position relative to the body portion of the spirit-level, thereby compensating for any wear incident to the use of said body portion.

Other objects and advantages will be made fully apparent from the following specification considered in connection with the accompanying drawings, in which—

Figure 1 is a side elevation of my improved spirit-level complete ready for use. Fig. 2 is a transverse section, on a slightly-enlarged scale, on line 2 2 of Fig. 1. Fig. 3 is a detail view of the interior parts of my improved spirit-level. Fig. 4 is a perspective detail view thereof. Fig. 5 is a perspective detail view of the device employed to hold the spirit-tube in position. Fig. 6 is a perspective detail view of one of the retaining-plates provided with an aperture through which the spirit-tubes are rendered visible. Fig. 7 is a perspective detail view showing the recess provided in the body portion of my spirit-level with the interior parts thereof removed and also showing the set-screw employed to adjust or true the position of the spirit-tube. Fig. 8 is a detail view showing one of the retaining-plates, formed of rubber or the like, designed to lie between the metal plate and the glass, and thus anchor the glass safely in position. Fig. 9 is a side view of the recess formed in the body portion illustrated in Fig. 1, showing the interior parts and the exterior retaining-plate removed.

In order to conveniently designate the various parts of my invention and the elements required to cooperate therewith, numerals will be employed, of which 1 indicates the body portion of my improved spirit-level, which may be of the usual or any preferred construction and reinforced at the end portions by the metal plate 2, substantially as shown, or said reinforcement may extend throughout the entire length of the body portion to guard against undue wear thereof, as is obvious.

Preferably in the central portion of the body-section I form a recess or opening 3, extending entirely through the body portion, and within which I dispose the housed or interior portions comprising my spirit or level tubes. The spirit-tubes proper are designated by the numeral 4, each of which is provided with a bead or air-bubble, both ends of the tube being permanently closed. Each end of each tube is seated in a thimble, as indicated by the numeral 5, one of said thimbles being provided with a rib-like extension or ear 6, provided with an aperture through which the anchoring-rivet 7 is loosely passed, the ends of the rivet being secured in suitable apertures provided in the housing-plates 8, as illustrated in Fig. 3. The thimble upon the free end of the tube thus mounted in position is preferably provided with the head-section 9, formed upon the outer edge of said thimble, designed to receive the inner end of a set-screw 10, by which the said thimble upon the free end of the tube may be moved or adjusted, as will be hereinafter more clearly set forth. The thimbles 5 are preferably connected together by means of the integral rib or connecting-arm 11, and in order to hold the thimble upon the free end of the tube normally outward I provide the controlling-spring 12, which is anchored in position upon the plate 13, which is a flange or integral projection from one of the plates 8, there being one of such plates 8 upon each side of said thimbles, the plate upon the opposite side, however, having no projecting flanges, the members 13 of the one plate being of sufficient width, as seen in Fig. 2, to hold the plates 8 apart and leave the free end of the spirit-tube 4 to move freely between the same.

A set-screw 14 may be employed to hold the



end of the spring 12 secured to the plate 13, while the opposite end of said spring is secured in a recess in the head 9, as will be clearly obvious by reference to Fig. 3. The plate 13 being stationary will limit the outward movement of the thimble upon the free end of the spirit-tube 4, while the set-screw 10 may be employed to move said thimble inward to the desired extent sufficient to true a spirit-tube 4.

With respect to the spirit-tubes which are disposed longitudinally with the body portion 1 it is obvious that the set-screws 10 may extend through the contiguous part of the body 1 into direct engagement with the head 9, thereby providing simple and efficient means for controlling the free end of said tube. In respect, however, to the tubes 4, which are disposed transversely to the body portion 1, I prefer to so shape the extreme inner ends of the set-screws designed to cooperate therewith that they will be conical in form, as indicated by the numeral 15, said conical end being designed to cooperate with the recess 16, provided in the contiguous part of the head 9, thereby enabling the proper adjustment to be easily and expeditiously accomplished. The size of the recess 3 is sufficient to permit the two plates 8, with the spirit-tubes interposed between them, to be received, as indicated in Fig. 2, and when the parts are centrally disposed within the body portion I place upon each side thereof a piece of felt, rubber, or the like, as indicated by the numeral 17, suitably cut away, as indicated in Fig. 6, to expose the inner side of the spirit-tubes.

Immediately upon the outer sides of the cushions 17 I dispose the suitable piece of heavy plate-glass or the equivalent thereof, as indicated by the numeral 18, through which the interior spirit-tubes may be readily seen. Upon the outer side of the cover of glass thus or otherwise provided I place a cushion of rubber, felt, or the equivalent 19, to be followed by the inclosing or exterior plate 20, properly held in position by screws 21 or other means, it being understood that said plate, if desired, may be made ornamental and attractive in appearance.

It will be understood that the parts of my improved spirit-level may be made of any preferred size and of any desired material deemed most suitable for meeting all of the requirements of such an instrument, and while I have described the preferred construction and combination of parts I wish to comprehend in this application all substantial equivalents and substitutes as may be considered to fall fairly within the scope and purview of my invention.

By reference to the foregoing specification, considered in connection with the accompanying drawings, it will be obvious that the

adjustment of any of the spirit-tubes may be quickly accomplished by the set-screws 10, said set-screws being so disposed that they will bear against the free end of the tube to be adjusted, thus making it possible by one or more turns of said screw to dispose the spirit-tube through the cooperation of its spring 12 in the exact or true position desired. It will be further understood that the set-screws 10 are to be of sufficient length to insure that the outer end thereof will not extend beyond the surface of the body portion 1, but will lie flush therewith or be depressed below the same in order that the ends of said set-screws may not interfere with the free and proper use of the instrument. I have therefore merely for the purposes of convenience of illustration shown said set-screws as extended beyond the surface of the body portion 1.

Having thus fully described the construction and manner of using my improved instrument, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination with the body portion having aperture, of the thimbles arranged about the sides of said aperture and each pair of thimbles pivoted at one end, the free end of each thimble being provided with a head having a notch, means connecting said thimbles, springs having one end in the notch of each head, and fixed plates to which the other ends of said springs are anchored, and spirit-tubes held in said thimbles, as set forth.

2. The combination with the body portion having aperture, of the thimbles arranged about the sides of said aperture and each pair of thimbles pivoted at one end, the free end of each thimble being provided with a head having a notch means connecting said thimbles, springs having one end in the notch of each head, fixed plates to which the other ends of said springs are anchored, spirit-tubes held in said thimbles, and housing-plates to which said thimbles are anchored, as set forth.

3. The combination with the body portion having aperture, of the thimbles arranged about the sides of said aperture and each pair of thimbles pivoted at one end, the free end of each thimble being provided with a head having a notch and a recess, means connecting said thimbles, springs having one end in the notch of each head, fixed plates to which the other ends of said springs are anchored, spirit-tubes held in said thimbles, housing-plates, and set-screws cooperating with the recesses in said heads, all as and for the purpose specified.

In testimony whereof I affix my signature in presence of two witnesses.

ERNEST STOWE.

Witnesses:

WM. H. KINNEAR,  
W. S. WADE.