

No. 720,145.

PATENTED FEB. 10, 1903.

R. W. HODGINS.
LEVEL.

APPLICATION FILED AUG. 8, 1902.

NO MODEL.

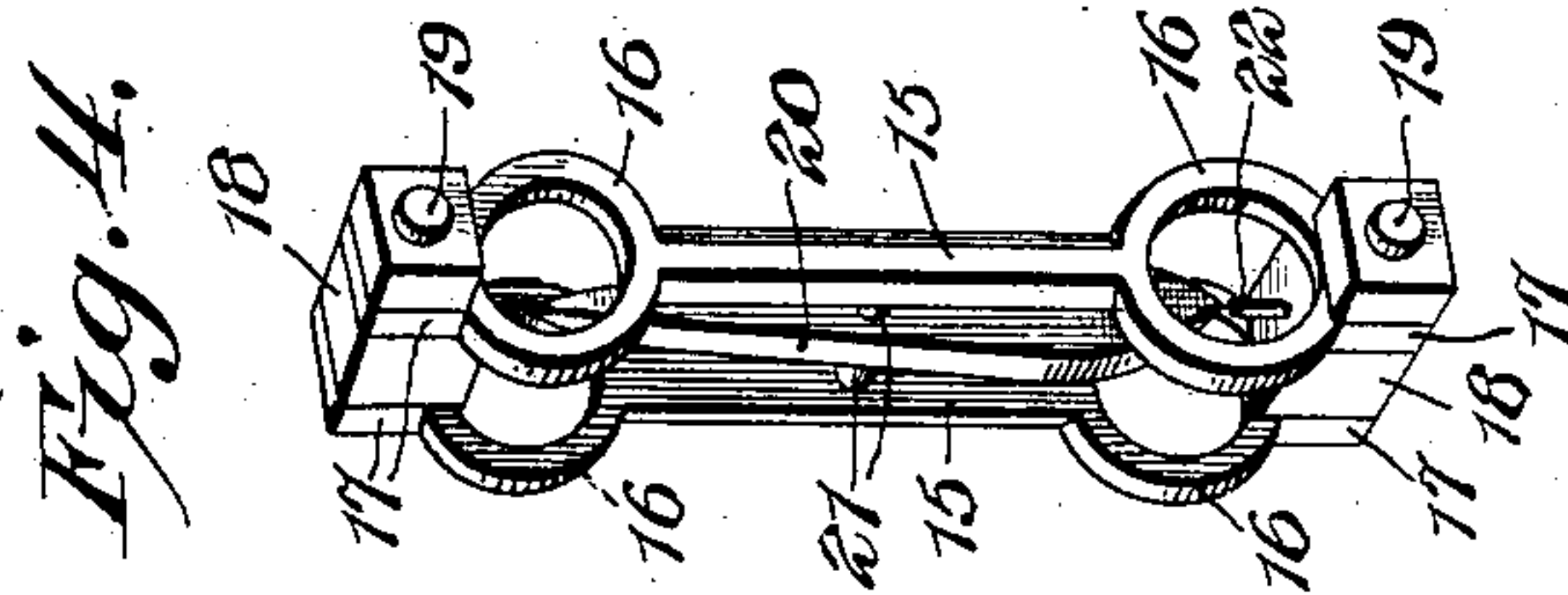
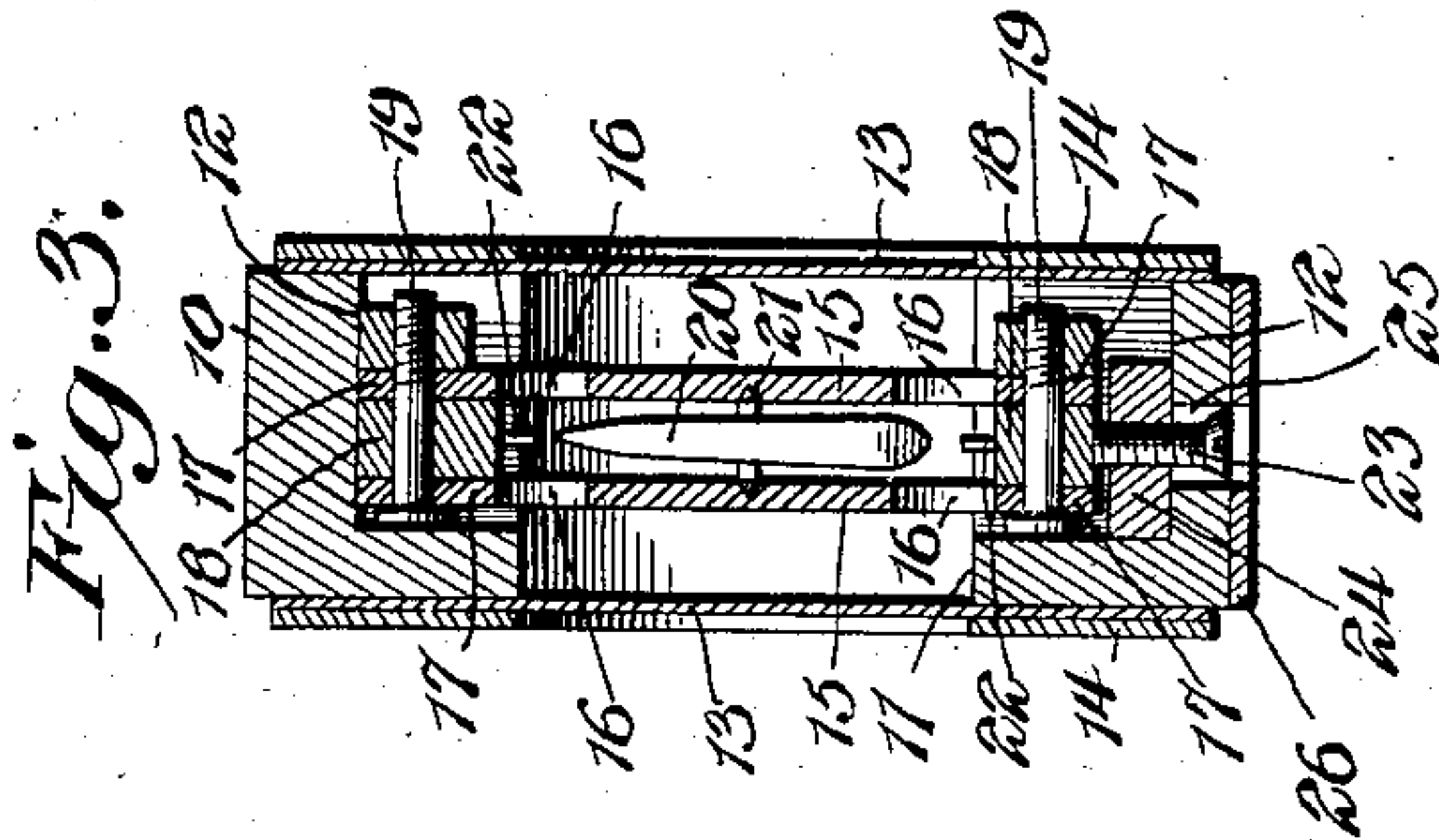
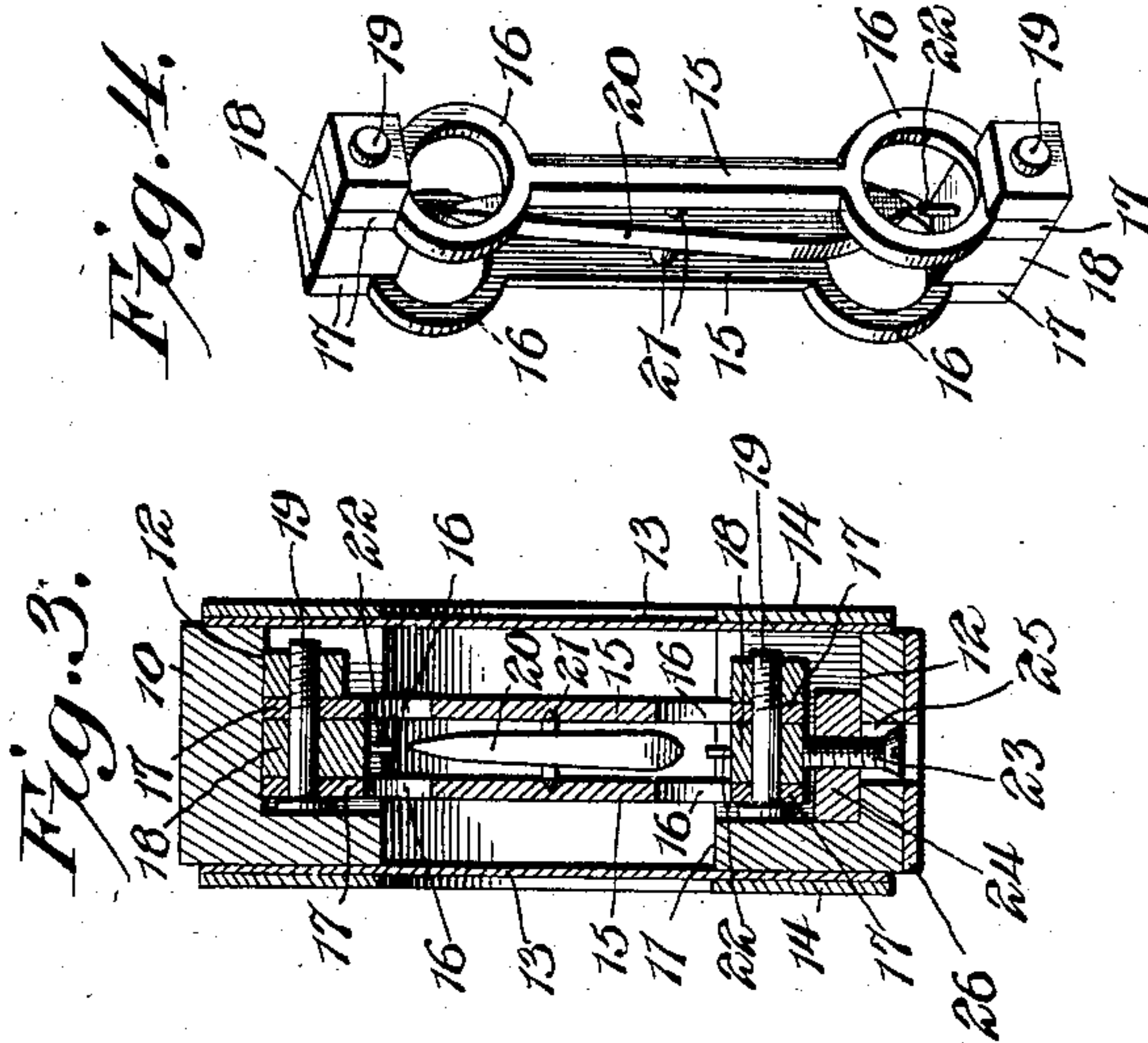
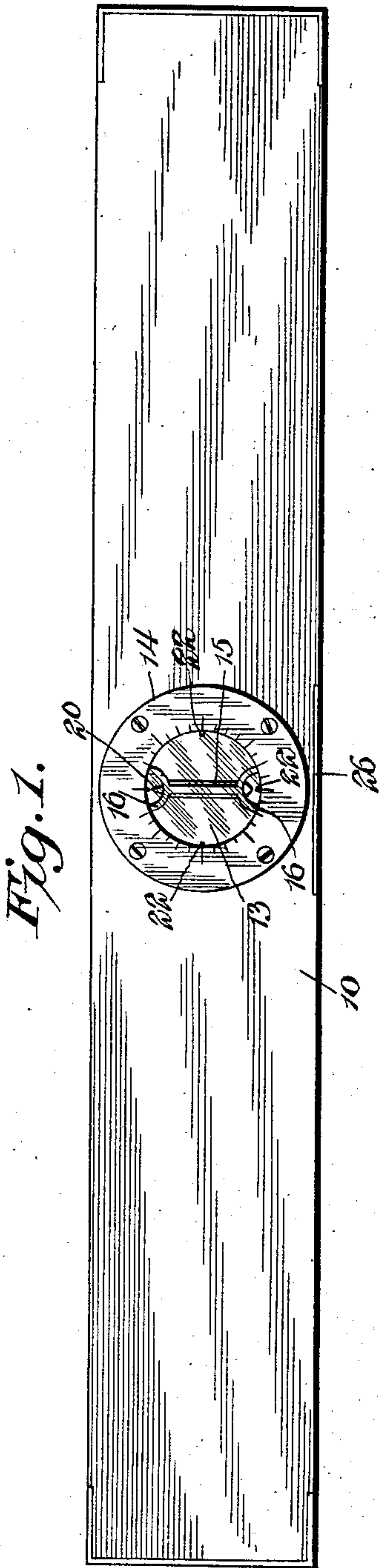
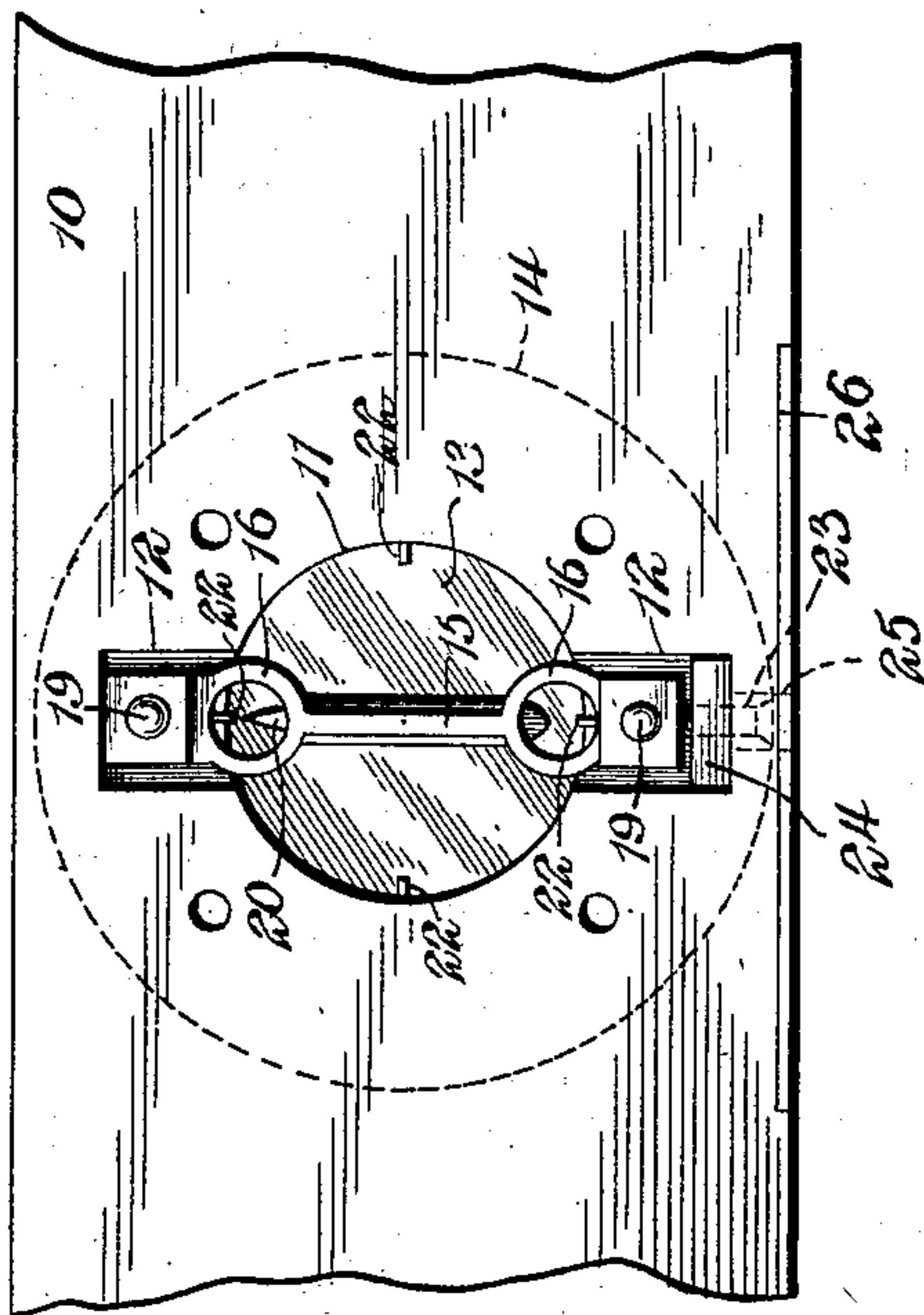


Fig. 5.



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UNITED STATES PATENT OFFICE.

RAY W. HODGINS, OF GRAND RAPIDS, MICHIGAN.

LEVEL.

SPECIFICATION forming part of Letters Patent No. 720,145, dated February 10, 1903.

Application filed August 8, 1902. Serial No. 118,951. (No model.)

To all whom it may concern:

Be it known that I, RAY W. HODGINS, a citizen of the United States, residing at Grand Rapids, in the county of Kent and State of Michigan, have invented a new and useful Level, of which the following is a specification.

This invention relates to improvements in plumb-levels and inclinometers; and the object thereof is to provide a structure which is simple, easily manufactured, and at the same time accurate and sensitive.

A further object of the invention is to provide simple means for adjusting the indicating mechanism with relation to the stock or body, so that should it become displaced through any cause its position can be easily rectified.

The preferred form of the invention is illustrated in the accompanying drawings, wherein—

Figure 1 is a view in elevation of the new instrument. Fig. 2 is a similar view, on an enlarged scale, of the central portion of the instrument, one of the cap-plates being removed. Fig. 3 is a vertical transverse section through the same. Fig. 4 is a detail perspective view of the supporting-frame and pointer.

Similar reference-numerals indicate corresponding parts in all the figures of the drawings.

In the embodiment of the invention shown a stock 10 is employed, which is of the usual shape and may be constructed of any material desired, this stock having a centrally-disposed socket 11, preferably circular in form, and oppositely-located seats 12, communicating with the socket. The socket extends entirely through the stock, while the seats terminate short of one side, as shown in Fig. 3. The said socket, furthermore, is preferably covered by suitable transparent material, such as mica 13, which is held in place by cap plates or disks 14. A supporting-frame is mounted within the socket and seats and is constructed as follows: Two spaced side bars 15 are employed, having open circular portions 16 contiguous to their opposite ends, the terminals of said bars being in the form of projections or lips 17. Spacing-blocks 18 are located between the

lips 17 to separate the bars 15, and fastening devices in the form of bolts 19 are passed through the lips 17 and the blocks 18, thus securing the whole together. Arranged between the side bars is a weighted indicator-pointer 20, having a transverse journal-pin 21, the ends of which are pointed and engage in suitable sockets formed in the opposing inner faces of the bars, as is illustrated in Fig. 3. The pointer is arranged to coact with indicating-points 22, arranged upon the inner ends of the spacing-blocks, said points being arranged in the spaces between the circular portions 16, which therefore constitute sight-openings. The frame is mounted within the stock 10 by having its ends fitted in the seats 12. It is secured by means of a set-screw 23, threaded through a block or nut 24, arranged in the lower socket 12, the inner end of the set-screw bearing against the lower spacing-block, while the outer end is provided with the usual head, that is located in a socket 25, formed in the lower wall of the stock, said head being protected by a plate, as 26.

The instrument is used in exactly the same manner as the ordinary plumb-level, and it can also be employed as an inclinometer. It will be apparent that the structure can be easily manufactured, as many of the elements are duplicates and all are of the simplest character. Because of the arrangement of the spacing-blocks and the pointer the indicating-points carried by said spacing-blocks can first be adjusted properly with relation to the pointer, and the frame can be mounted as a whole within the stock. Hence it is adjustable, as the seats in which the ends of the frame are located are large enough to permit the movement of said frame, which can be held in adjusted position by the set-screw. In this structure, furthermore, there is little chance of breakage, as in the form shown no glass is employed.

The adjustment of the points mentioned above is obtained by loosening the bolts 19 and rotating the blocks 18, thus changing the positions of the points 22 as desired, after which the bolts are retightened, again clamping the blocks against movement.

From the foregoing it is thought that the construction, operation, and many advantages of the herein-described invention will

be apparent without further description, and it will be understood that various changes in the size, proportion, and minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

Having thus described the invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In an instrument of the class described, the combination with a stock having a socket, of a frame mounted in the socket and having one end resting against one wall thereof, a set-screw bearing at one end against the opposite end of the frame to secure it against movement in the socket, and a pointer suspended in the frame.

2. In an instrument of the class described, the combination with a stock having a socket and oppositely-disposed seats communicating with the socket, of a frame adjustably mounted in the socket and having its ends fitted in the seats, a set-screw bearing at one end against one end of the frame and forcing the other end against the wall of the socket to hold said frame against movement, and a pointer suspended in the frame.

3. In an instrument of the class described, the combination with a body having a socket, of a frame located in the socket, said frame comprising side bars, spacing-blocks arranged between the ends of the bars, fastening devices passing through said ends and the spacing-blocks, and a weighted pointer arranged between and journaled upon the side bars.

4. In an instrument of the class described,

the combination with a body having a socket, of a frame located in the socket, said frame comprising side bars, spacing-blocks arranged between the ends of the bars and having indicating-points on their inner ends, fastening-bolts passing through said ends and the spacing-blocks, and a weighted pointer arranged between and journaled upon the side bars.

5. In an instrument of the class described, the combination with a stock having a socket, of a frame arranged in the socket and comprising spaced side pieces and a block carrying an indicating-point, said block being adjustably mounted between the side pieces to vary the position of the indicating-point, and a pointer journaled in the frame and coacting with the indicating-point.

6. In an instrument of the class described, the combination with a stock, of a frame arranged therein and having side bars provided contiguous to their ends with aligned side openings, a pointer journaled to and between the bars and projecting within the lines of the openings, and an indicating-point carried by the frame and coacting with the pointer, said point being also located in line with the sight-openings.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

RAY W. HODGINS.

Witnesses:

CHARLES M. OWEN,
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