

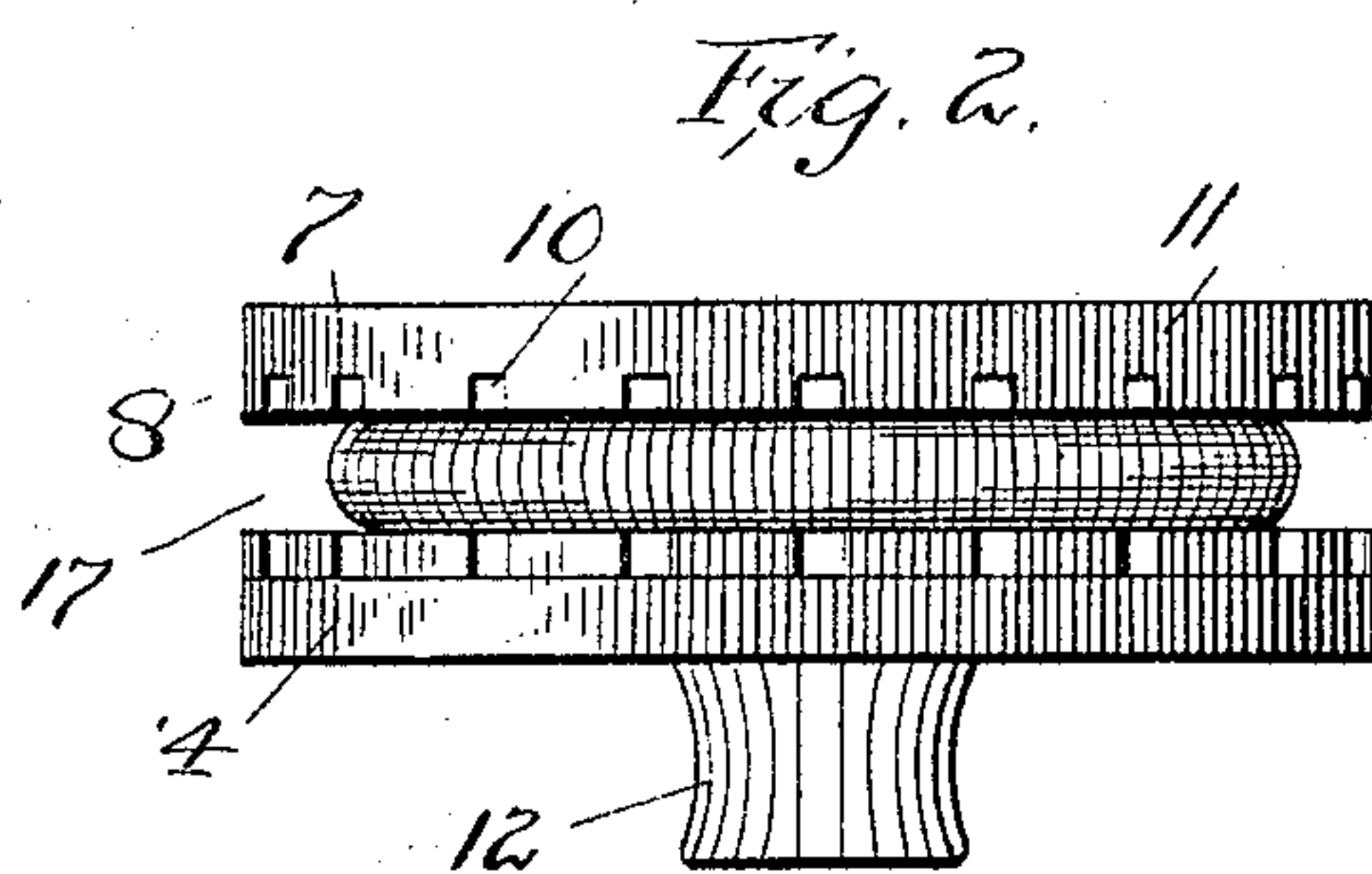
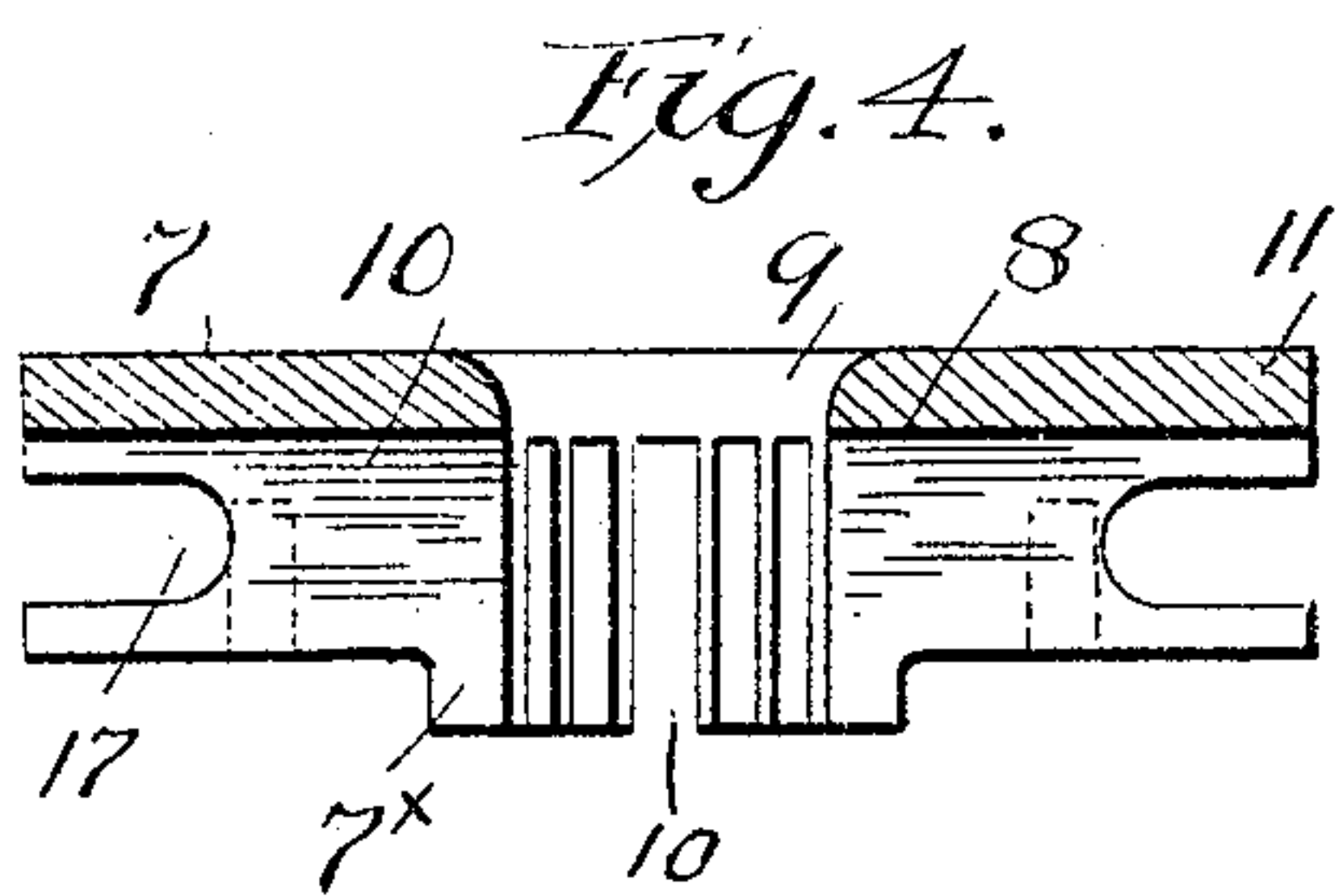
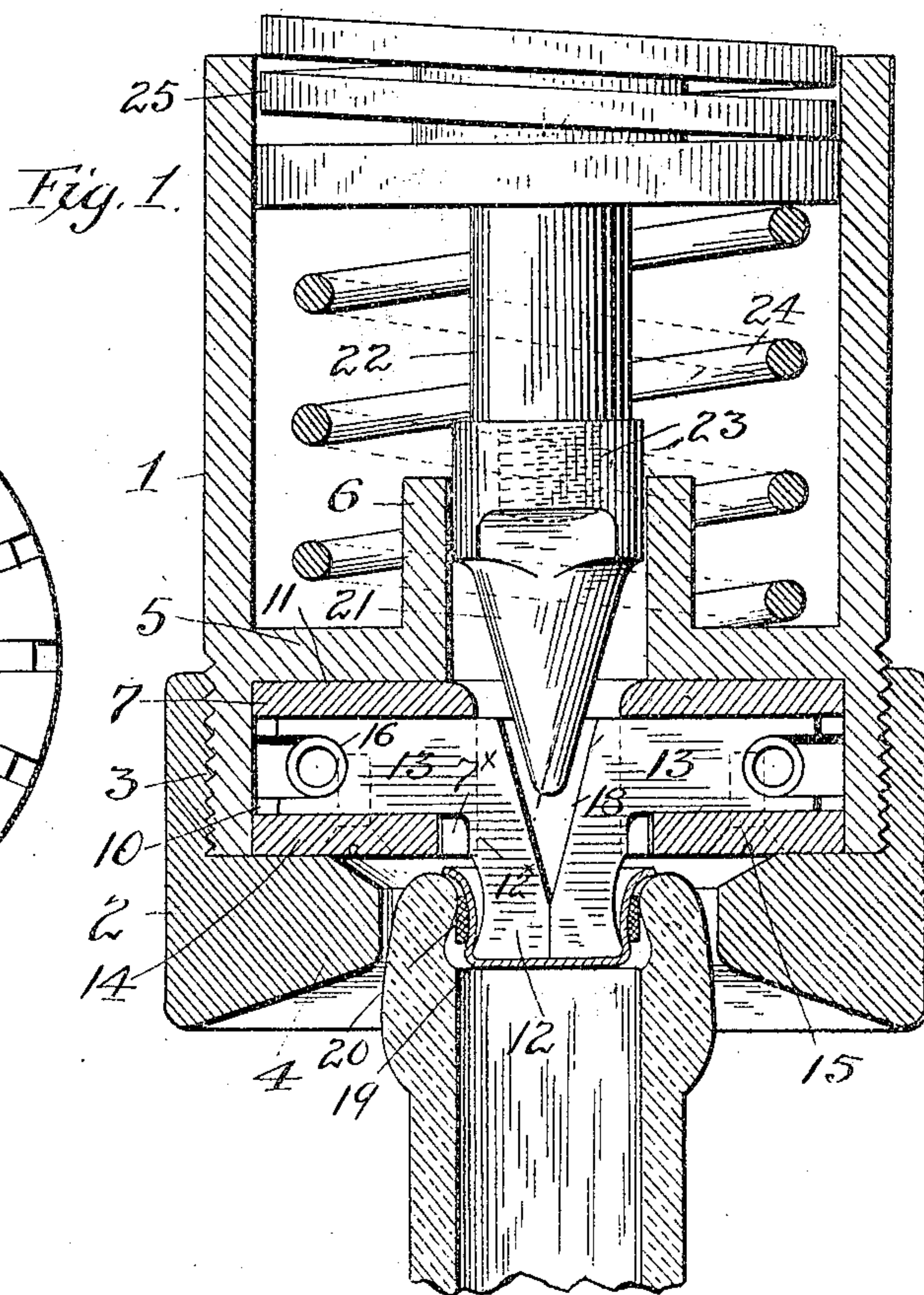
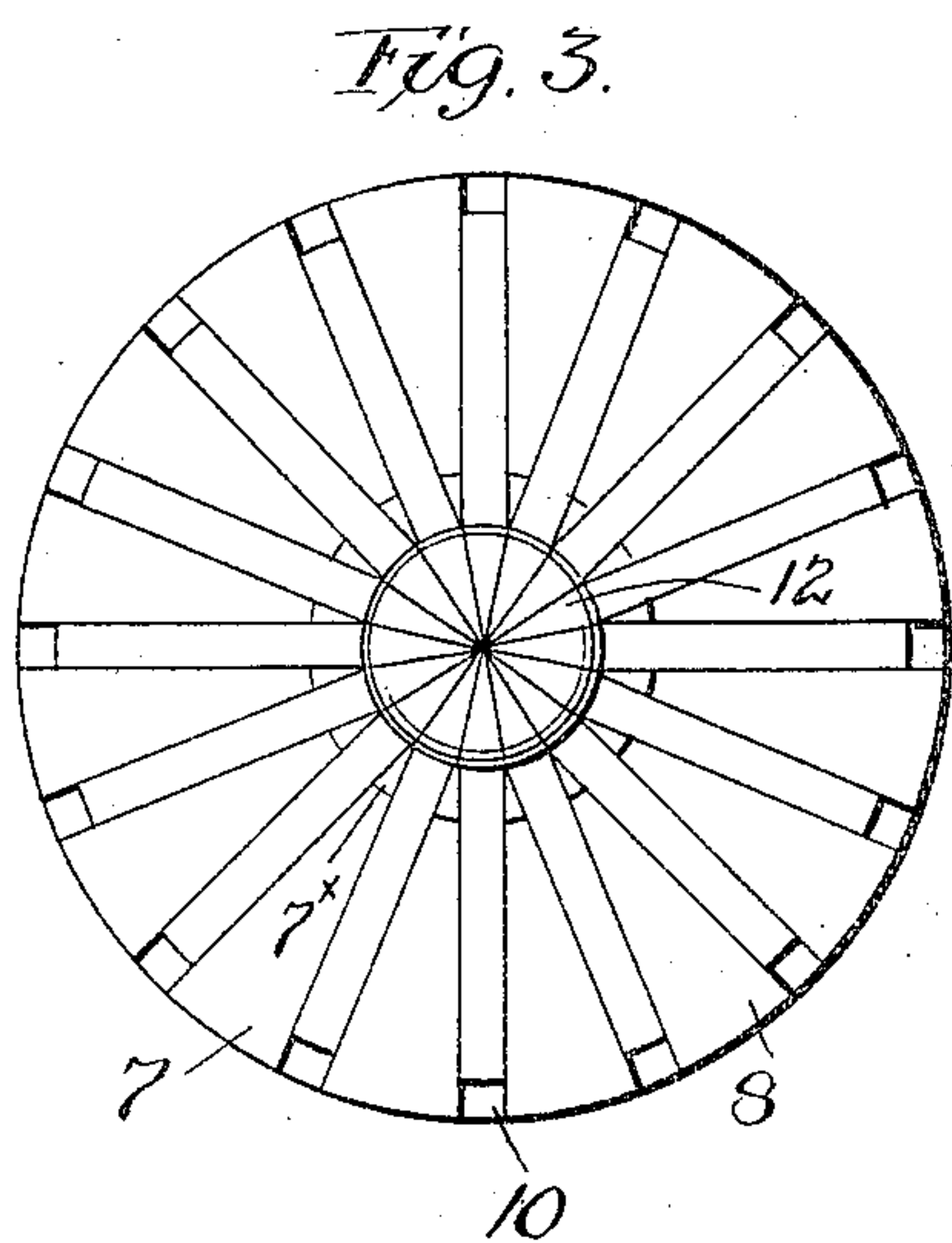
No. 808,556.

PATENTED DEC. 26, 1905.

W. E. LINDSAY.

APPARATUS FOR APPLYING STOPPERS TO BOTTLES.

APPLICATION FILED MAR. 3, 1904.



Attest.
Edward H. Red
C. M. Mallett

Inventor
WILLIAM E. LINDSAY
by Ellis Spear & Company
Attys.

UNITED STATES PATENT OFFICE.

WILLIAM E. LINDSAY, OF BALTIMORE, MARYLAND, ASSIGNOR TO THE
CROWN CORK & SEAL COMPANY, OF BALTIMORE, MARYLAND.

APPARATUS FOR APPLYING STOPPERS TO BOTTLES.

No. 808,556.

Specification of Letters Patent.

Patented Dec. 26, 1905.

Application filed March 3, 1904. Serial No. 196,428.

To all whom it may concern:

Be it known that I, WILLIAM E. LINDSAY, a citizen of the United States, residing at Baltimore, Maryland, have invented certain new and useful Improvements in Apparatus for Applying Stoppers to Bottles, of which the following is a specification.

My invention relates to apparatus for applying stoppers to bottles of that class in which a metallic stopper is placed within the neck of the bottle and expanded outwardly into sealing relation with the bottle, a suitable gasket or sealing-washer being compressed between the said seal and the inner wall of the bottle-mouth.

My invention concerns means for expanding the stopper into sealing contact; and it consists in the features and combination and arrangement of parts hereinafter described and pointed out in the claims.

In the accompanying drawings, Figure 1 is a vertical sectional view through so much of the apparatus as will illustrate my invention. Fig. 2 is a side view of the expander-head detached from the apparatus. Fig. 3 is a bottom plan view of part of the expander-head, and Fig. 4 is a sectional view through the part shown in Fig. 3.

In the drawings, 1 indicates the cylinder or frame of the apparatus, onto the lower end of which is held a ring 2 by means of the screw-thread connection 3. The ring has an inwardly-projecting lower flange 4, through the central opening in which the head of the bottle may be inserted, as shown in Fig. 1. The frame or cylinder is provided with a transverse partition 5, centrally apertured and having also an annular vertically-extending flange 6 above the said central aperture.

Between the flange of the ring and the partition the expander-head 7 is held. This head comprises a circular piece 8, having a vertically-extending central opening 9 and a series of grooves 10, radiating from the central opening, said grooves extending from the lower face of the circular piece part way only to the upper face, leaving a solid unbroken part of the metal at 11, forming substantially the top plate and guide for the shanks of the expander-jaws. These expander-jaws 12 depend from the head, as shown in Fig. 1, to enter the mouth of the bottle, and they are each formed on its outer

edge to correspond with the vertical contour of the inner side of the bottle at its mouth. The jaws normally are in contact with each other at the center of the head, and they form a projection to enter the bottle-mouth, having substantially a continuous or unbroken periphery.

The jaws proper are carried by shanks 13, which are arranged to slide in the radial grooves above mentioned, wherein they are held and guided by the top plate 11 and by a bottom plate 14, held to the head by the screws 15. The shanks have notches 16 in their outer ends, and a spiral or other spring encircles the said head, lying in the outer annular groove 17 thereof and in the notches of the shanks, and thus yieldingly presses the expander-jaws inwardly. The expander-jaws depend from the head, and their upper portions at 12^x lie and move between depending ribs or projections 7^x, arranged about the central opening and between the grooves. The inner edges of the expander-jaws are inclined upwardly and outwardly, forming an upwardly-flaring or inverted-cone-shaped recess 18. The expander-jaws are spread apart for the expanding action on the stopper 19 and the interposed packing-ring 20 by a cone-shaped plunger 21, adapted to work upon the inclined inner edges of the expander-jaws. This plunger or spreader is carried by a bar 22, to which it is attached by screw threads 23, and to which a downward movement may be given in any suitable manner, a spring 25 being employed as a part of the driving means to yield after a certain pressure is reached, and a second spring 24 serving to lift the spreader when the driving force is removed.

It will be noticed that the expander-jaws move directly outward in a horizontal plane at right angles to the axis of the bottle-mouth, and as their outer edges are made to conform with the vertical interior contour of the bottle-mouth the metal of the stopper will be expanded throughout its vertical extent and will be forced into equal sealing relation with the bottle at all points throughout the height of the stopper. As a result of this the rubber or other sealing gasket or washer will be pressed into sealing contact with the bottle at its upper as well as at its intermediate and lower parts.

I have illustrated the principle of my in-

vention in connection with the form of stopper known as the "aluminium," consisting of a cup-shaped body of metal having a gasket or washer surrounding it. One form of such stopper includes an annular bead at the lower end of the stopper to hold the rubber ring in place and to shut off the gasket from contact with the contents when the stopper is expanded against the bottle. The expanding jaws are therefore shown as adapted to seat this annular beaded portion against the bottle.

It will be observed that the bearing-surface of the conical spreader follows up the movement of the jaws and constantly serves as a support or backing for the jaws, preventing their rupture under the spreading strain, and this support is furnished to the downwardly-extending portions of the jaws and reaches to near the lower ends thereof. By reason of the support thus furnished by the spreader-cone the jaws may be composed of a greater number of radiating sections than would be possible without said backing or support, because with said support the jaws may be made thin without liability of rupture under the spreading strain, and therefore more jaws may be used in forming the bead, and consequently the division or space between the jaws will be less when they are spread apart than would be the case with fewer jaws. This results in a more effective expansion of the stopper throughout its periphery, there being more pressure-points and less space between them.

The bottom plate 14, above mentioned, is formed of hard metal to withstand the wear which comes upon it from the sliding thereon of the shanks of the jaws, and this plate may be renewed at any time desired, it being, as above noted, held in place by the screws 15.

It will be observed that the movement of the spreading-cone, which acts to separate the jaws, takes place wholly above the plane of the lower faces or edges of the spreading jaws. This enables the apparatus to be used in connection with cup-shaped seals, the bottoms of which seals or cups lie across the lower ends of the spreading jaws during the operation of the device.

I claim—

1. In apparatus for expanding a metallic stopper within the mouth of a bottle and against a sealing-gasket, the combination of a head having a plurality of radial grooves therein, and a series of jaws each having a

shank guided in one of the radial grooves independently of the other jaws, to have sliding movement only and in a plane at right angles to the axis of the bottle-mouth, and a conical spreader for moving the said jaws, the said conical spreader in separating the jaws moving in a direction from the shanks to the free ends of the jaws, substantially as described.

2. In an apparatus of the class described, the combination of a head having radial grooves therein, jaws having shanks guided individually in the grooves to have sliding movement only and in a plane at right angles to the axis of the bottle, a plate fitting against one face of the said head to hold the shanks in place, and a conical spreader for moving the jaws outwardly, the said conical spreader in separating the jaws moving in a direction from the shanks to the free ends of the jaws and an encircling spring for moving the jaws inwardly, said spring engaging the outer ends of the shanks within the head, substantially as described.

3. In combination in a device of the class described, the grooved head, jaws having shanks extending at right angles thereto and having inclines extending from the top edges of the shanks downwardly, and a spreader working against the inclined edges of the jaws, the movement of the said spreader being limited to a point above the lower free ends of the jaws, substantially as described.

4. In an apparatus for applying cup-shaped seals to bottles, the combination of a head having a series of radial grooves, jaws depending from the said head and having right-angular shanks moving radially in the said grooves, the said jaws being in contact with each other normally and having inclined edges extending from their contacting parts upwardly in rear of the shanks, a conical spreader having its point directed downwardly and normally above the jaws, and a spring for holding the jaws normally together, said spring engaging the outer ends of the shanks, and being located within the head, the outer edges of the jaws being shaped to conform to the inner surface of the bottle-mouth, substantially as described.

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

WILLIAM E. LINDSAY.

Witnesses:

HOWARD D. ADAMS,
HARVEY COALE.