

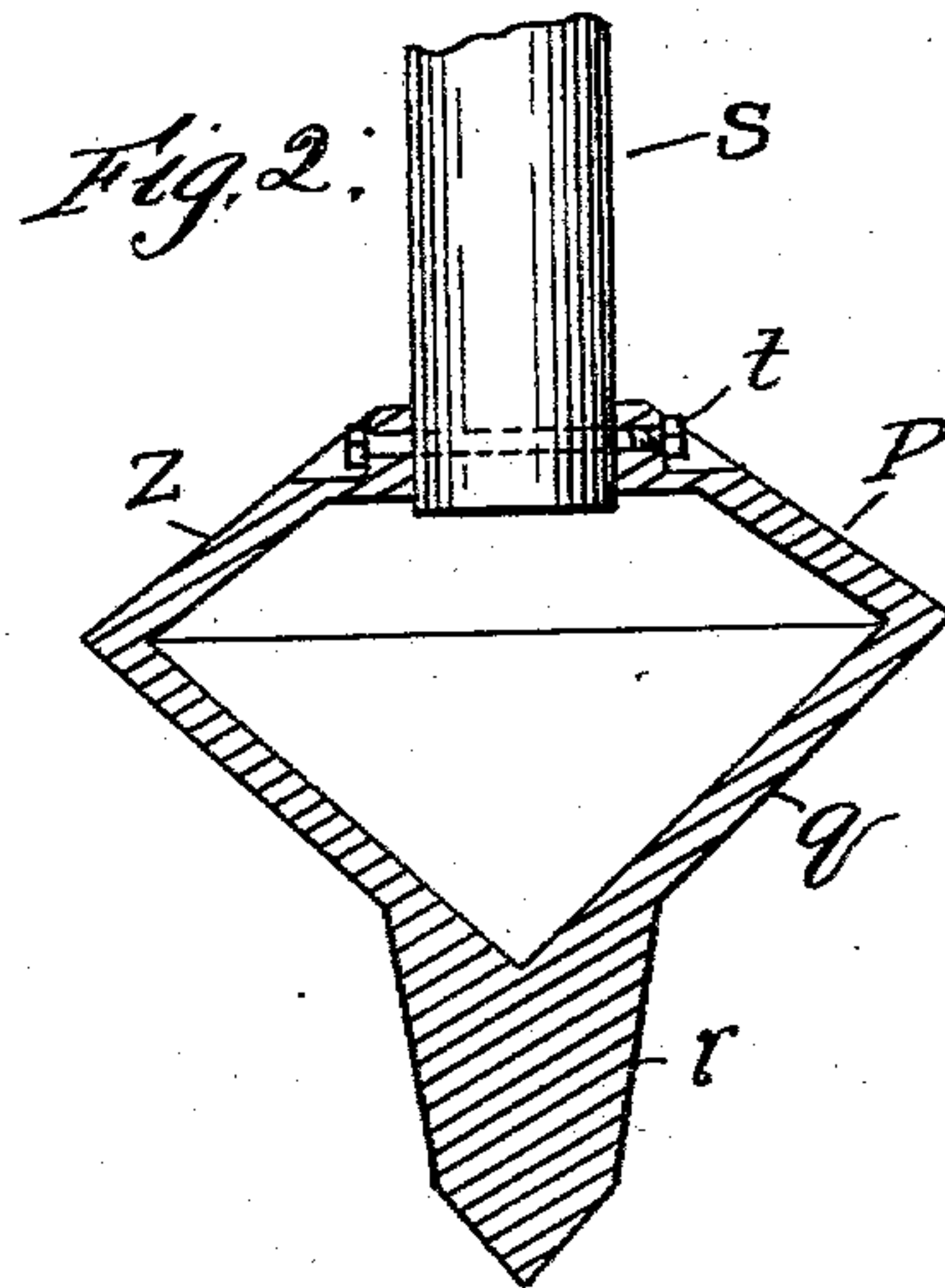
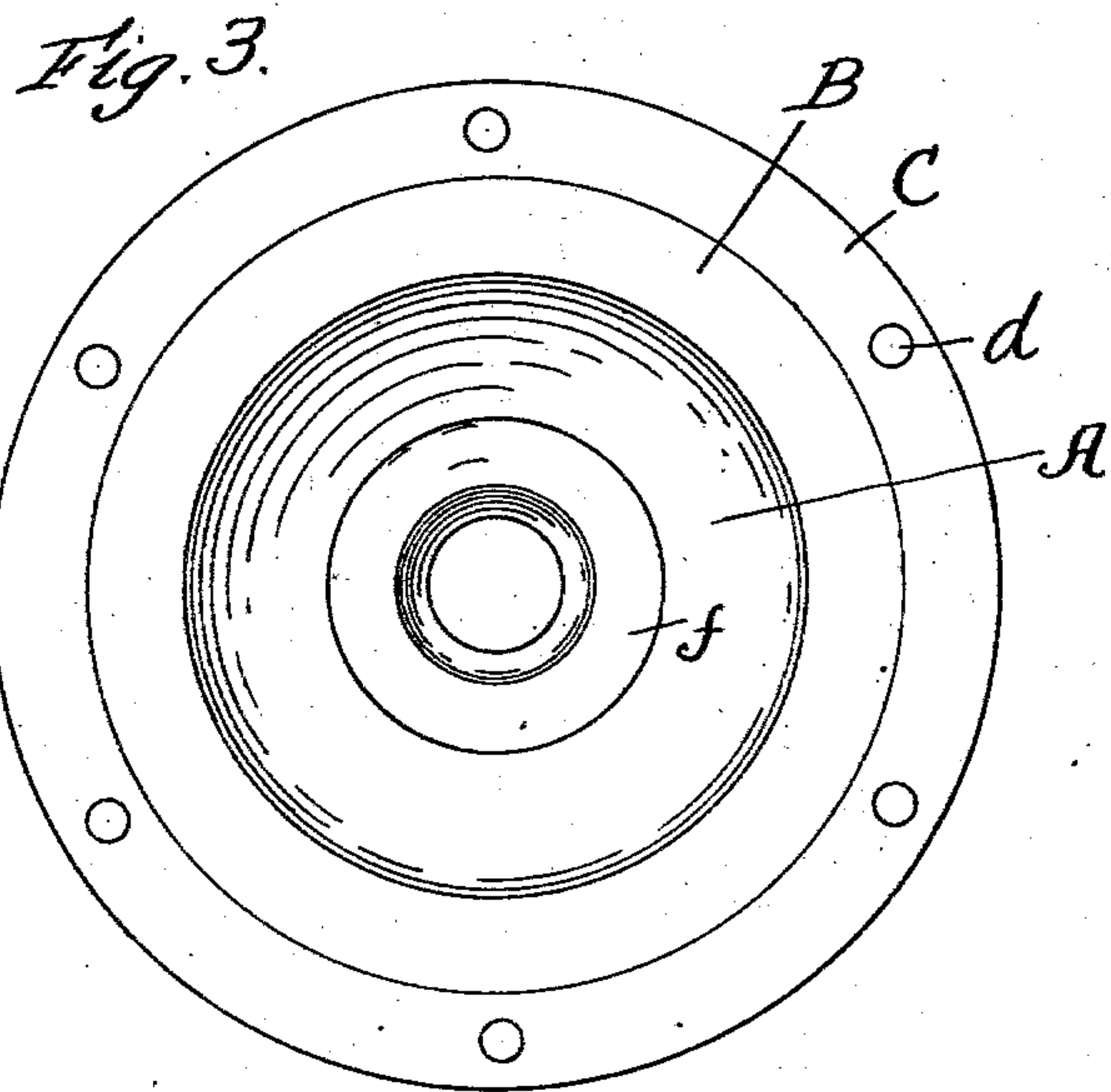
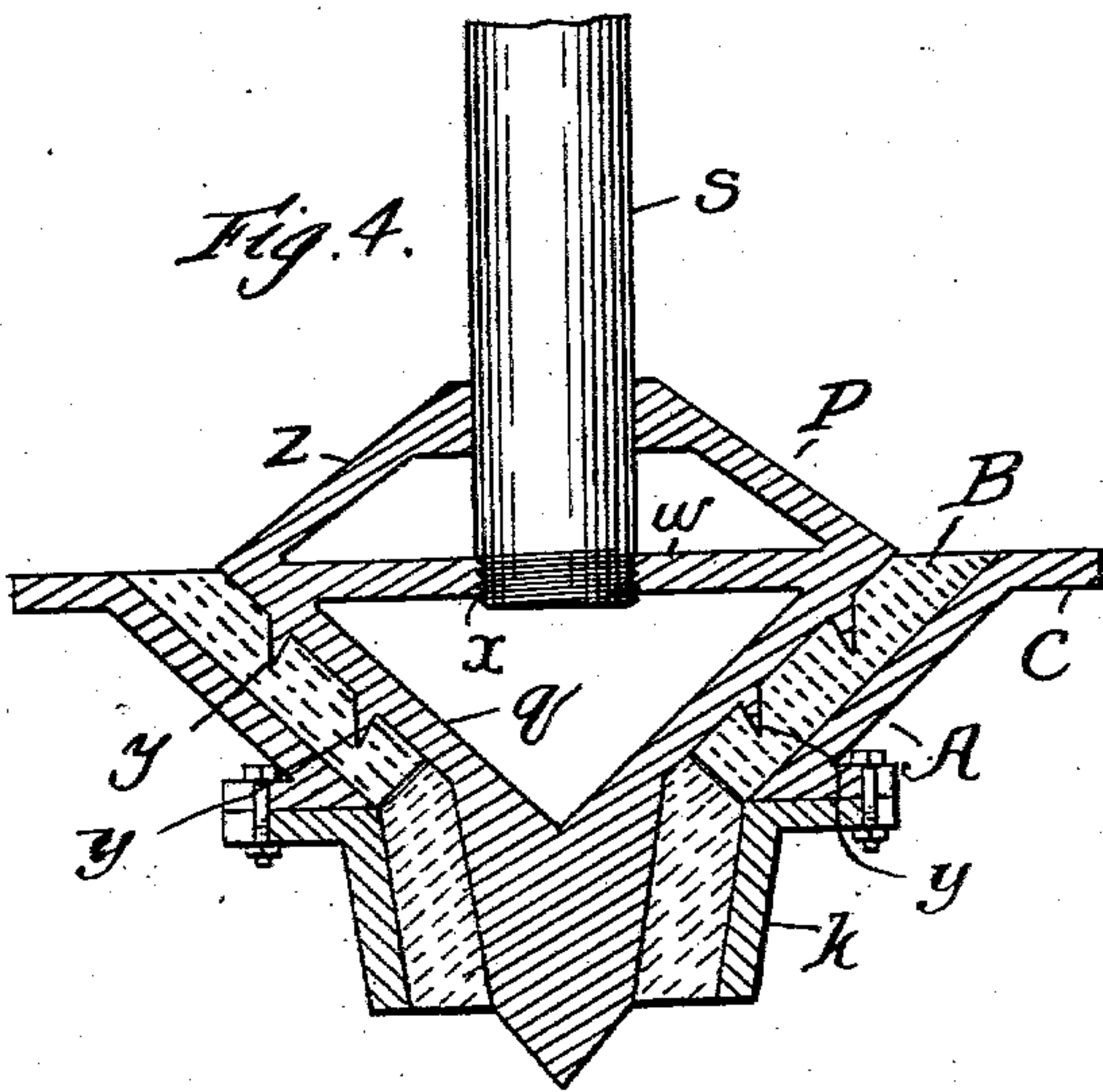
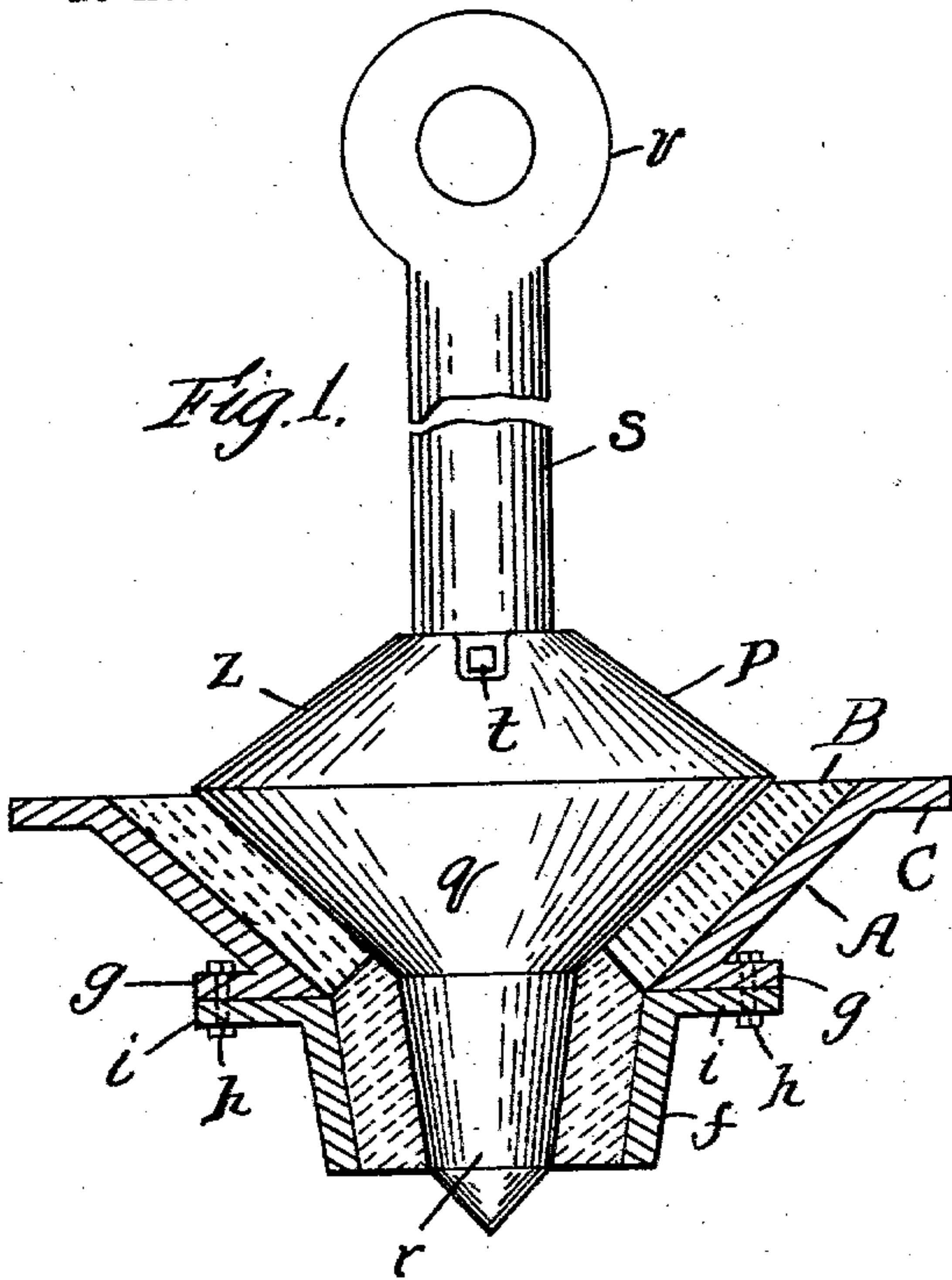
No. 743,549.

PATENTED NOV. 10, 1903.

C. O'CONNOR.
STOPPER VALVE FOR CASTING LADLES.

APPLICATION FILED JAN. 17, 1903.

NO MODEL.



Witnesses:
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UNITED STATES PATENT OFFICE.

CHARLES O'CONNOR, OF MANCHESTER, NEW HAMPSHIRE.

STOPPER-VALVE FOR CASTING-LADLES.

SPECIFICATION forming part of Letters Patent No. 743,549, dated November 10, 1903.

Application filed January 17, 1903. Serial No. 139,431. (No model.)

To all whom it may concern:

Be it known that I, CHARLES O'CONNOR, of Manchester, county of Hillsboro, State of New Hampshire, have made certain new and useful Improvements in Stopper-Valves for Casting-Ladles, of which the following is a description sufficiently full, clear, and exact to enable any person skilled in the art or science to which said invention appertains to make and use the same, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a side elevation of my improved valve, the seat or outlet being shown in section; Fig. 2, a vertical transverse section of the valve; Fig. 3, a top plan view, and Fig. 4 a sectional view illustrating modifications.

Like letters of reference indicate corresponding parts in the different figures of the drawings.

My invention is an improved valve for casting-ladles, comprising a body adapted to be fixed to the ladle and a nose removably clamped to the fixed body, said body being provided with a lining made with a valve-seat and having a relatively large outlet and the nose with a separate lining removable with the nose and having a relatively small outlet. By this construction not only can the nose and its lining be removed without disturbing the contents of the ladle when said nose becomes choked, as frequently happens in pouring large quantities of molten steel, but the size of the discharge-orifice of the ladle may be varied at will to suit the size of mold into which the metal is poured.

Other features of my invention are hereinafter pointed out.

In the drawings, A represents the body or seat of the valve or discharge. This is substantially hollow, conical in shape, and is provided at its upper edge with an annular flange c, having bolt-holes d, whereby it may be secured to the discharge of the ladle. This body is provided with an integral downwardly-converging nose k, as in Fig. 4, or such nose may be detachable, as f in Fig. 1, and attached to said body by flanges g i and bolts h. This last I deem preferable, as the form of the nose may thus be varied to adapt it to different-shaped openings in the molds and other exigencies of the work. The body

or seat and nose are lined with fire-brick B, conforming to the shape of said body and forming the seat proper for the valve P, which comprises a hollow metal body double conical in shape, the bottom q of which is fitted to engage closely the seat A, in which position its conical top z will project above said seat, and consequently into the ladle when attached.

The stem s, provided with an eye v at its upper end, is inserted into the apex of the valve-top and secured by a bolt t, or, as in Fig. 4, the valve may be provided interiorly with a brace w and the end of the stem screw-threaded at x and turned into said brace.

The center or apex of the bottom q of the valve is provided with a solid finger r, projecting and converging downwardly and fitted to enter tightly that portion of the seat in the nose k. The end of the finger is conical to aid in centering the valve when seating.

In the modification shown in Fig. 4 the bottom q of the valve is provided with ribs y, fitted to enter suitable grooves in the seat A as an additional precaution against leakage.

In use when the valve is in position in the ladle and seated, as shown, the molten metal in said ladle presses equally against all portions of its conical top z and tends to drive said valve firmly against all portions of the seat. The ladle being adjusted in the usual manner by means of the crane until the nose k is in proper position over the mold, the operator by means of the ordinary levers pivoted to the ladle and connecting with the stem-eye v unseats valve P and the molten metal will discharge around said valve through nose k in a manner which will be understood without a more explicit description. The finger r is designed to remain at all times within the circle of the nose and centers the valve when reseating.

The peculiar shape of valve and seat when reseating to cut or stop the flow of metal serves to express the same from said seat and effectually prevents dripping or spattering when the ladle is again swung by the crane.

It will be understood that the lining B may be replaced at will.

As is well known in casting, it is sometimes necessary to change the size of the outlet-orifice of the ladle to agree with the size of the

mold into which the metal is to be poured, and as will be apparent with my improved nozzle this change may be readily effected from the outside of a filled ladle by removing
 5 the nose *f* and its lining when it is desired to enlarge the outlet-orifice and by replacing said nose and its lining when it is desired to provide a smaller outlet-orifice. In practice
 10 I propose to make the outlet end of the lining of the nose ordinarily about two inches in diameter and the outlet end of the lining of the body, as well as the inlet end of the nozzle-lining, about five inches in diameter, so that the operator can use either a five-inch
 15 orifice or a two-inch orifice.

It is a matter of considerable practical importance and value that the nose *f* and its lining are removable from the exterior of the ladle, because it often happens in pouring
 20 into a large mold that the discharge-orifice will become choked, owing to some of the metal cooling in the nozzle, and this is particularly true when a small discharge-orifice is used. Heretofore it has been necessary to
 25 remove the contents of the ladle in order to remove a choke, and this removal of the contents of the ladle has heretofore been a loss, inasmuch as it was necessary to pour the contents of the ladle onto the ground and after-
 30 ward break it up and remelt it; but when the nose of my valve becomes choked the operator after closing the stopper on its seat unfastens nose *f* and removes it, together with its lining, without disturbing the contents of
 35 the ladle, and after this has been done the pouring can be resumed with no loss.

Having thus explained my invention, what I claim is—

1. The improved valve for casting-ladles
 40 comprising a body provided with a lining made with a valve-seat and having a relatively large outlet; a nose provided with a separate lining having a relatively small outlet; a clamp detachably fastening the nose

and its lining to the body, and a stopper adapted to seat on the lining of the body. 45

2. In a valve for casting-ladles, a flaring valve-body, an annular flange extending around the upper portion of the same, a tapered nose secured to said body, a lining for
 50 the body, a valve comprising a conical body portion adapted to seat in the valve-body, an integral extension formed at the lower end thereof adapted to seat within the nose of said valve-body, and means for attaching a
 55 lifting means, substantially as described.

3. A valve of the type set forth comprising a hollow conical valve-body, a tapered nose secured thereto, a hollow valve mounted in the said valve-body, adapted to seat in the
 60 nose of the valve-body, a stem secured within the said valve, and attaching means formed at the end of the stem, substantially as described.

4. In a device of the character described
 65 comprising a tapered valve-body, a nose secured thereto, a lining in said body, a conical hollow valve carried in said lining having an extension for centering said valve in its seat in the valve-body, means carried by
 70 the valve for engaging in the lining, and an upwardly-projecting stem secured to the valve, substantially as described.

5. The hollow conical valve-body, *P*, provided with the bridge, *w*, in combination with
 75 the stem, *s*, projecting through the apex of said body and threaded in said bridge.

6. The hollow conical valve-body, *P*, provided with annular ribs, *y*, in combination with seat, *A*, having lining, *B*, provided with
 80 recesses for receiving said ribs.

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

CHARLES O'CONNOR.

Witnesses:

A. J. MCGLYNN,
 R. H. BRICKLEY.