

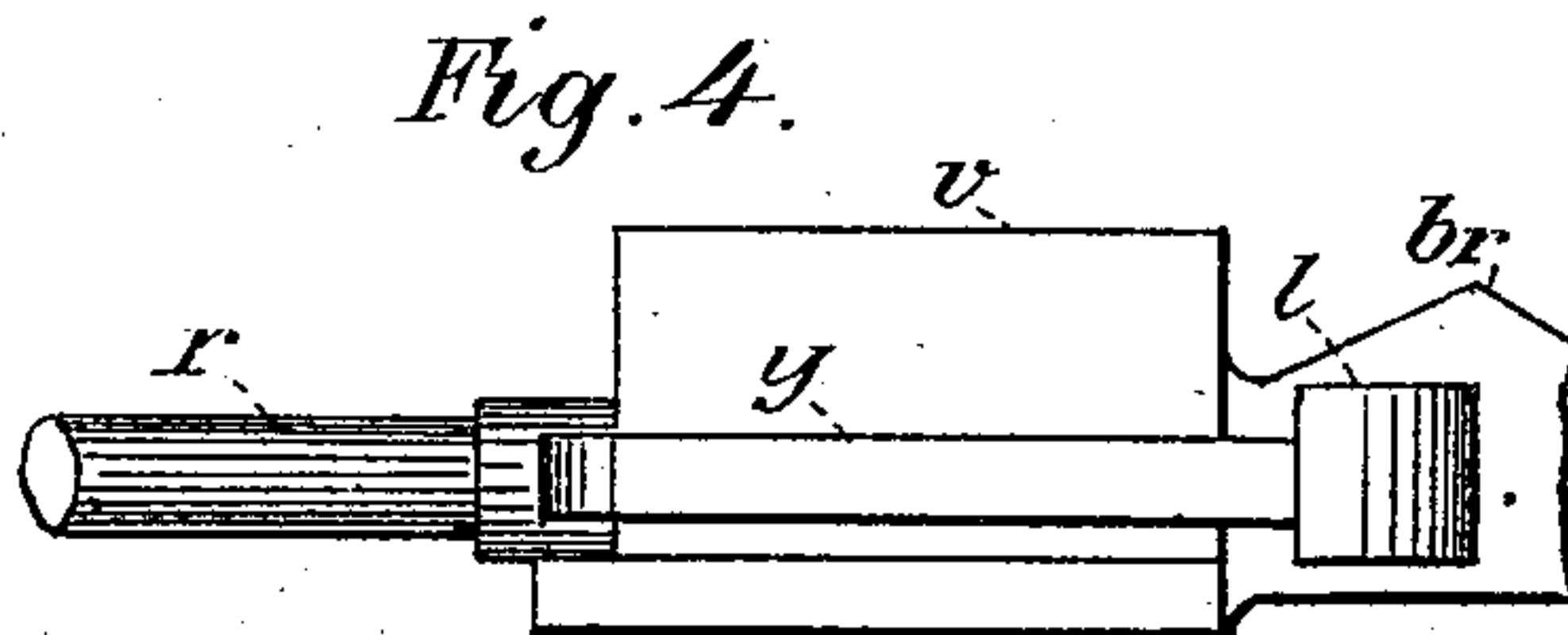
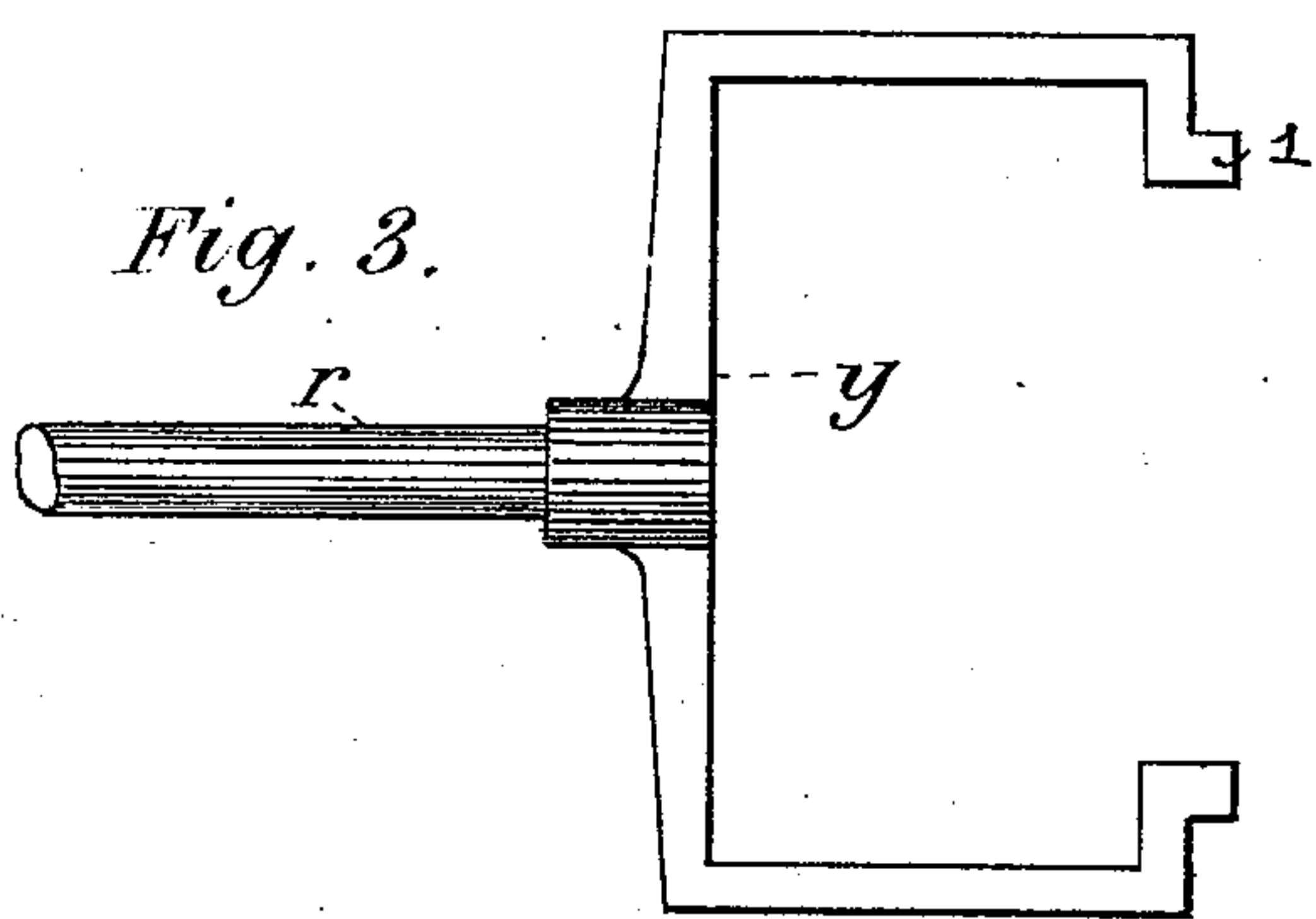
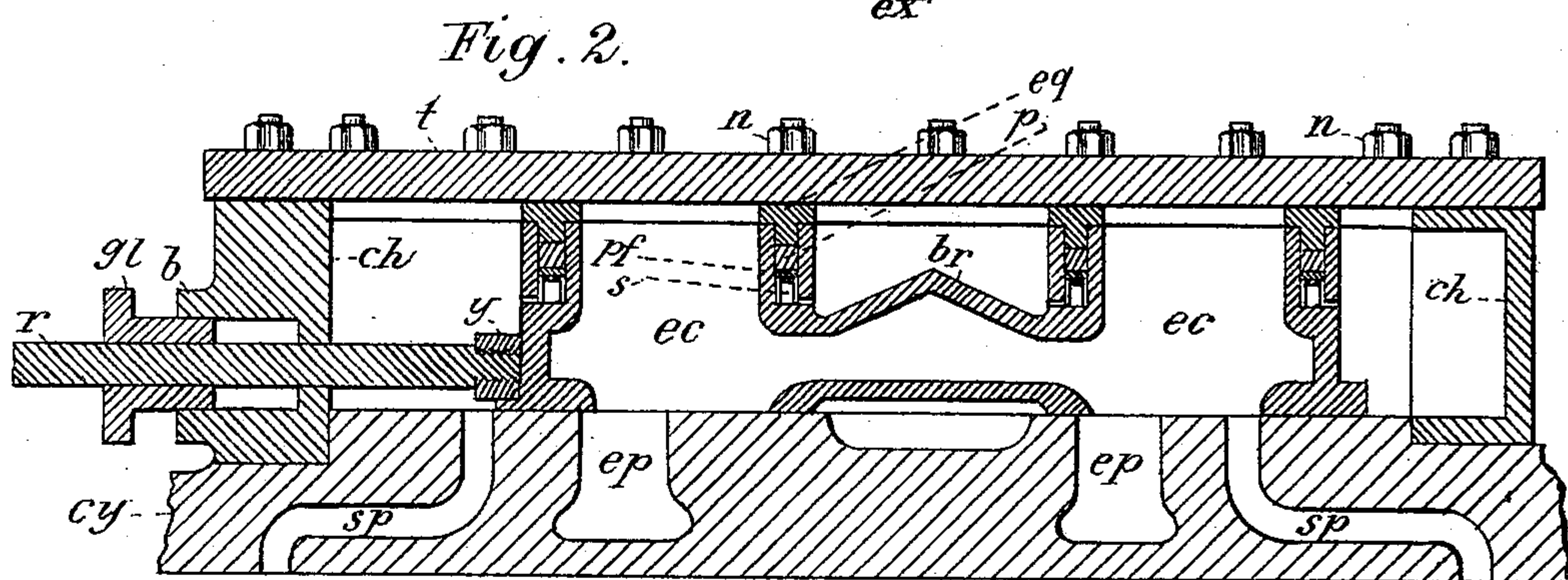
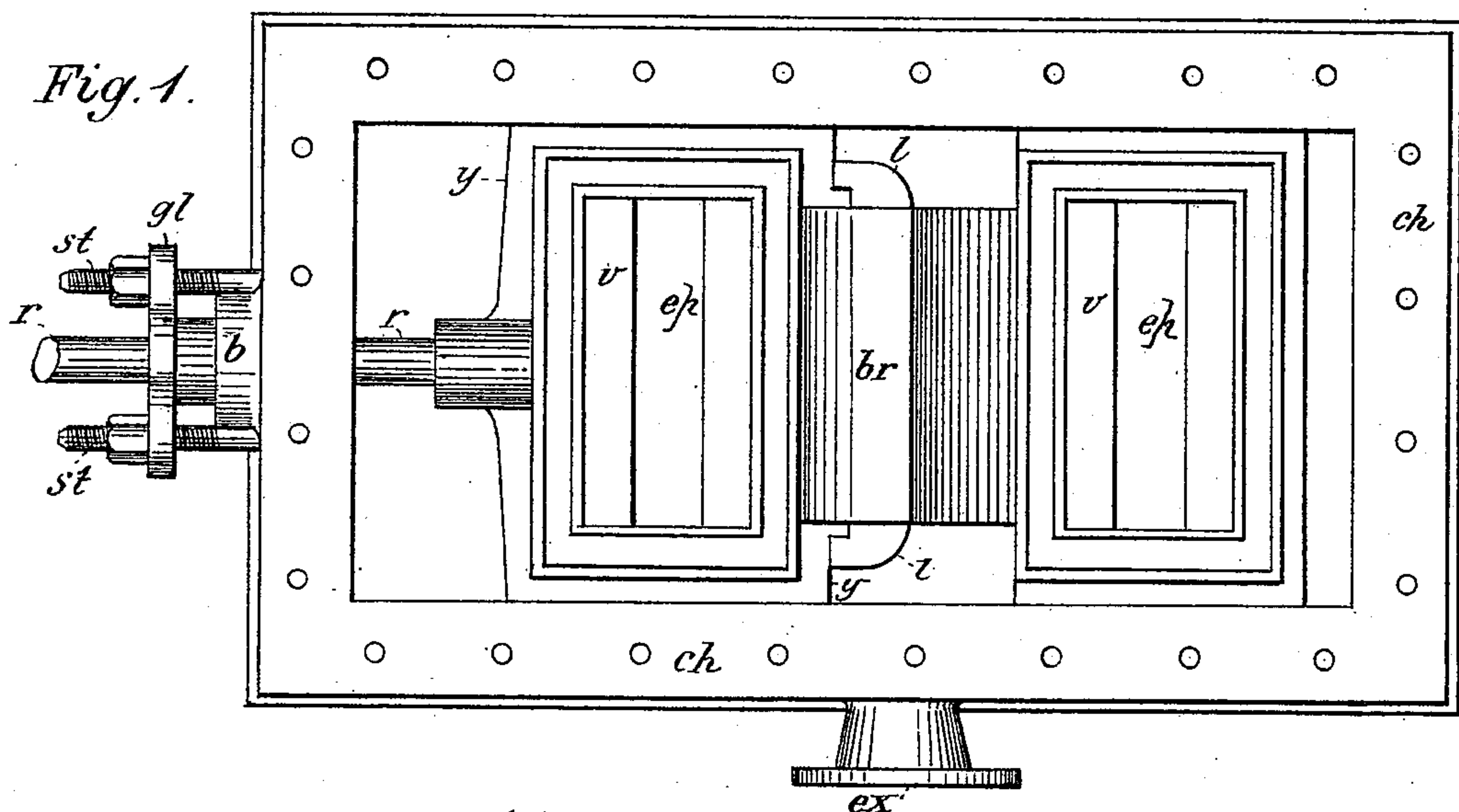
(No Model.)

J. BOOTH.

BALANCED SLIDE VALVE.

No. 355,432.

Patented Jan. 4, 1887.



WITNESSES.

Gustav Bohn.
Hattie Hurry.

INVENTOR,

John Booth.
By C. F. Jacobs
Atty.

UNITED STATES PATENT OFFICE.

JOHN BOOTH, OF INDIANAPOLIS, INDIANA.

BALANCED SLIDE-VALVE.

SPECIFICATION forming part of Letters Patent No. 355,432, dated January 4, 1887.

Application filed September 4, 1886. Serial No. 212,748. (No model.)

To all whom it may concern:

Be it known that I, JOHN BOOTH, a resident of Indianapolis, Marion county, Indiana, have made certain new and useful Improvements in Slide-Valves, a description of which is set forth in the following specification, reference being made to the accompanying drawings, in the several figures of which like letters represent like parts.

My invention relates to an improvement in slide-valves for engines, and is designed to relieve the surface of the valve from the friction consequent on the difference of pressure between the back of the valve and the cavity of the exhaust, and will be understood from the following description.

In the drawings, Figure 1 represents a top view of my device, the top of the steam-chest being removed, showing the interior arrangement of the parts. Fig. 2 is a horizontal section thereof. Fig. 3 is a top view of the yoke and a part of the valve-rod. Fig. 4 is a side view of the same.

In detail, *ch* represents the steam-chest; *r*, the valve-rod, which passes through the usual gland, *gl*, and boxing *b*, and is connected with the front end of the valve by means of the yoke *y*, attached to the inner end of the valve-rod. The valve itself is double, and the separate parts are constructed substantially like the single valve shown in Letters Patent No. 339,734, issued to me April 13, 1886, to which reference is made for a more particular description thereof. The present valve only differs from that in being double, the two parts being connected together by a bridge-piece, through which is an opening leading from the exhaust-cavity in one to the exhaust-cavity in the other valve, practically making a continuous exhaust. In order to fully understand the construction of this, it may be said that *cy* represents the top of the cylinder on which the steam-chest rests. On either side are steam-ports *sp*, and between these are exhaust-ports *ep*, opening directly into the exhaust-cavities *ec* of the valves, an opening being made from one to the other under the bridge, as hereinbefore mentioned. Each half of the valve has a groove extending around its walls or frame-work, in which are placed springs *s*, packing-frames *pf*, elastic or soft metal packing *p*, and the equalizing-frames *ef*, as de-

scribed in my former patent, so that the pressure of the steam will compress the packing material, and the steam cannot escape beyond the equalizing-frame, and it will force it outward against the steam-chest cover *t*, thereby making the upward-pressed surface of the frame equal to the downward-pressed surface of the valve. The shape of these valves is not material so long as the proper arrangement of the parts is preserved and the proper dimensions considered.

It is not intended in this patent to claim the arrangement of the equalizing-frame, the packing and springs in a single valve, for such relates to the subject-matter of the former patent issued to me.

My invention herein consists in extending the principle of the single valve to a double valve, and providing an opening connecting the exhaust-cavities of the two single valves under a bridge, as hereinbefore described. This principle of union is also applicable to the ordinary double slide-valve, provided the exhaust-cavity of each is connected by an opening from one valve to the other, as herein shown and described.

This valve is connected to the valve-rod by means of the yoke *y*, which has projections or lugs *l* on the inner end of its arms, and this yoke is dropped down over the front portion of the valve in such manner that the lugs on the arms of the yoke will enter recesses formed upon the inside of the lugs *l*, which are integrally connected with the sides of the bridge *br*, as shown in Fig. 1. This locks and secures the yoke in place around the front portion of the valve, and by means of this yoke-connection, which is provided with a threaded socket to receive the end of the valve-rod, the whole valve is moved. By this arrangement I put the strain upon the short arms of the yoke, which enter the recesses in the lugs connected with the valve-frame, while in ordinary valves the rod passes through and over the exhaust-cavity, thus cutting off its area and cramping the exhaust of the engine, while my device relieves the exhaust-cavity from any such diminution by the valve-rod. On an ordinary double slide-valve the yoke passes clear around or through both parts of the valve, but by this arrangement I avoid placing the yoke entirely around both sections of the valve, and at the

same time I make as secure and yet a more simple connection between the valve-rod and the valve itself.

What I claim as my invention, and desire to secure by Letters Patent, is the following:

1. A slide-valve provided with lugs *l*, recessed to admit the arms of the open yoke *y*, which fits over the front portion of the valve, such yoke connected with the valve-rod *r*, for operating the same, substantially as shown and described.

2. A double slide-valve, each portion hav-

ing removable tops resting upon packing supported by springs in grooves in the walls of the valve, with an opening connecting the exhaust-cavities of each, all combined substantially as described. 15

In witness whereof I have hereunto set my hand this 31st day of August, 1886.

JOHN BOOTH.

Witnesses:

C. P. JACOBS,
HATTIE MURRY.