

A. R. Morrill,
Steam Balanced Valve.

N^o 22,192.

Patented Nov. 30, 1858.

Fig. 1.

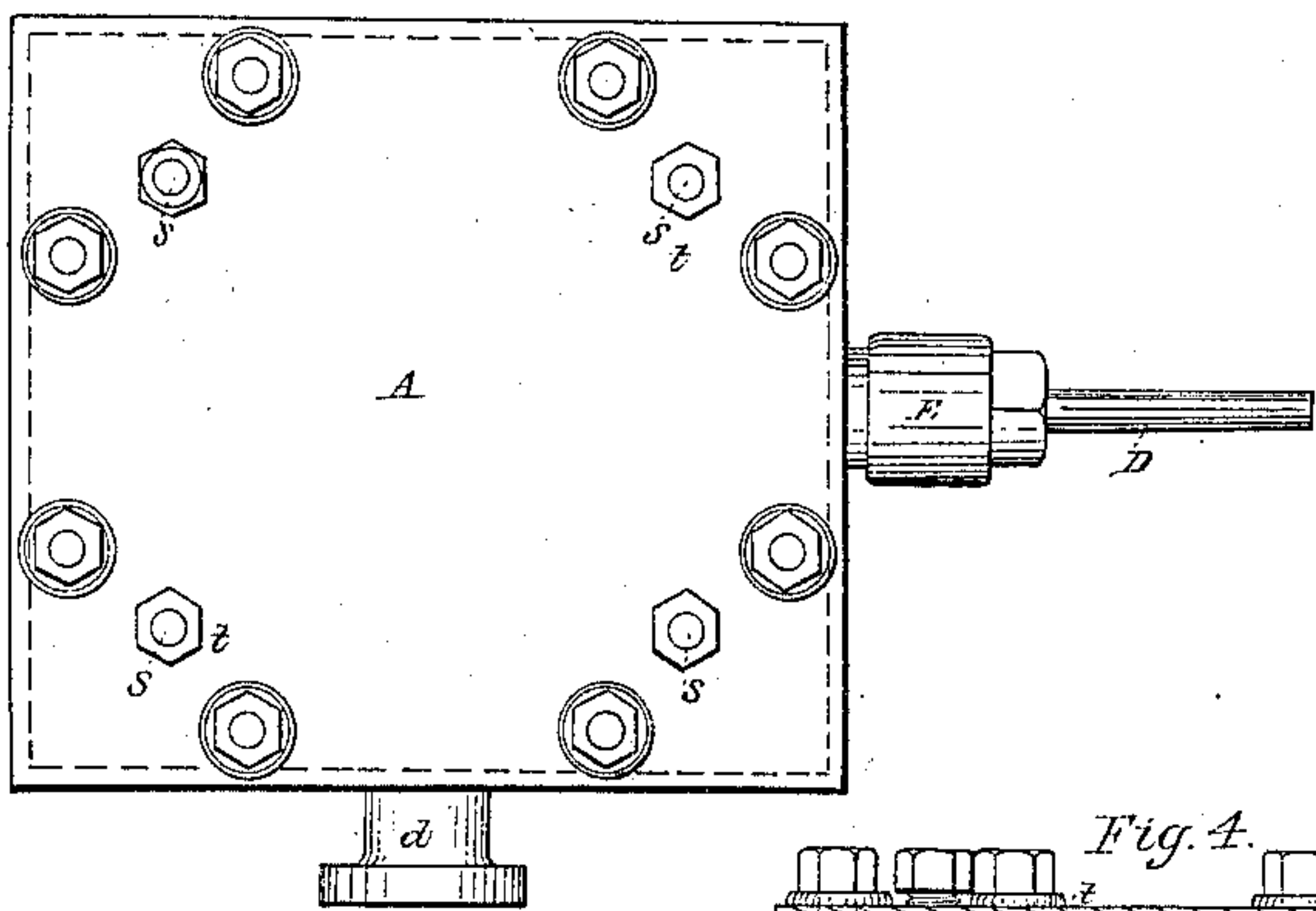


Fig. 5.

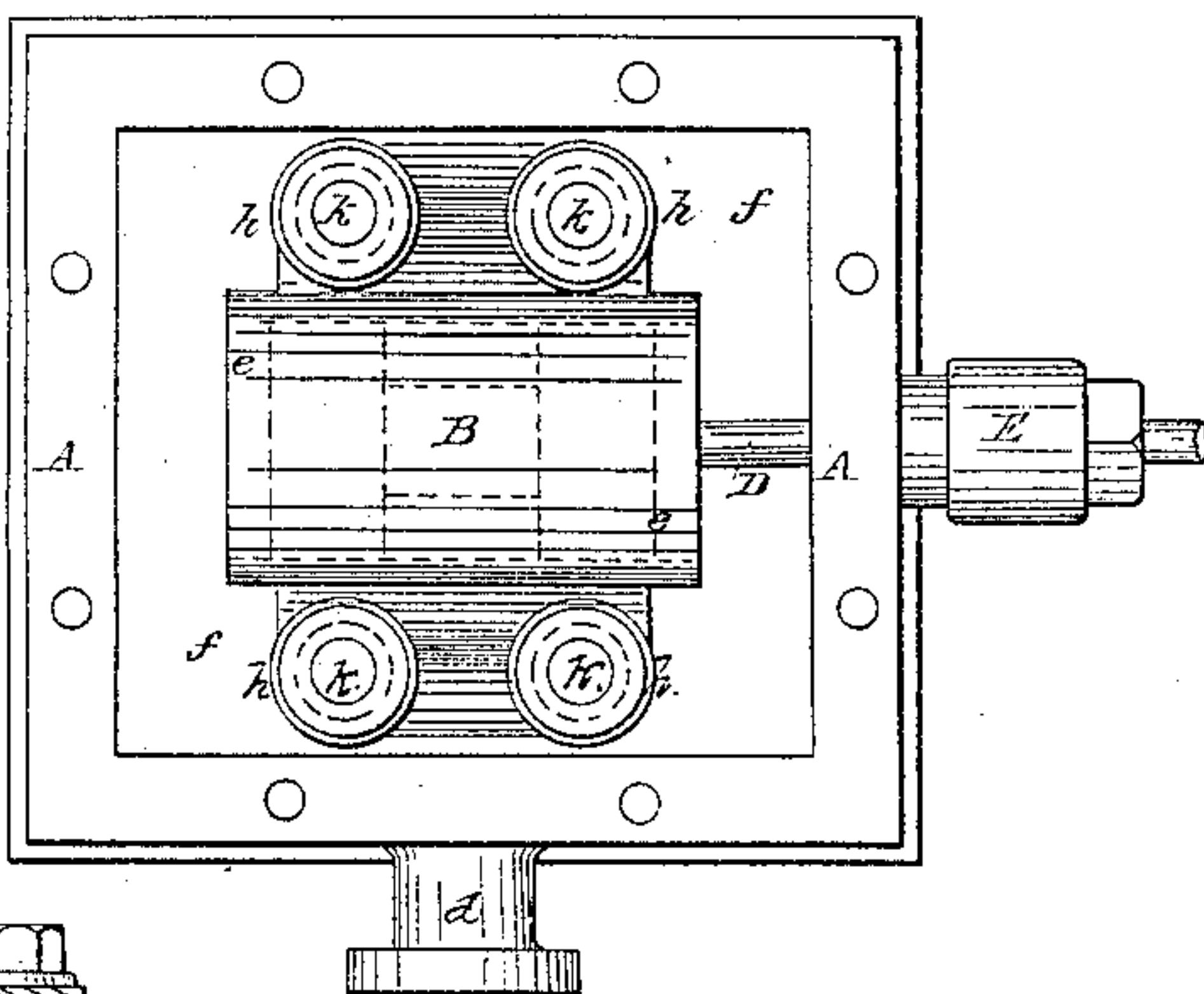


Fig. 4.

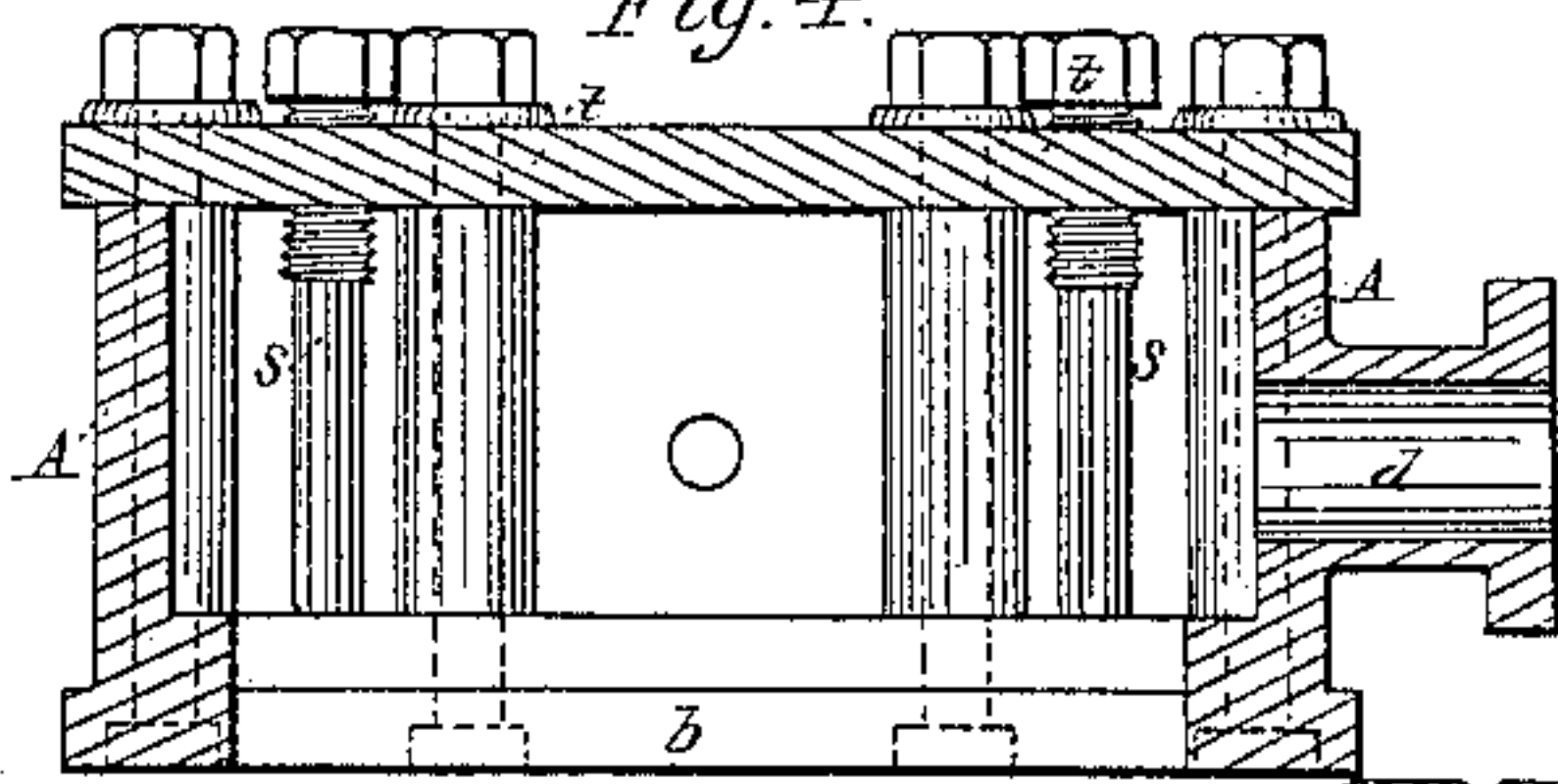


Fig. 2.

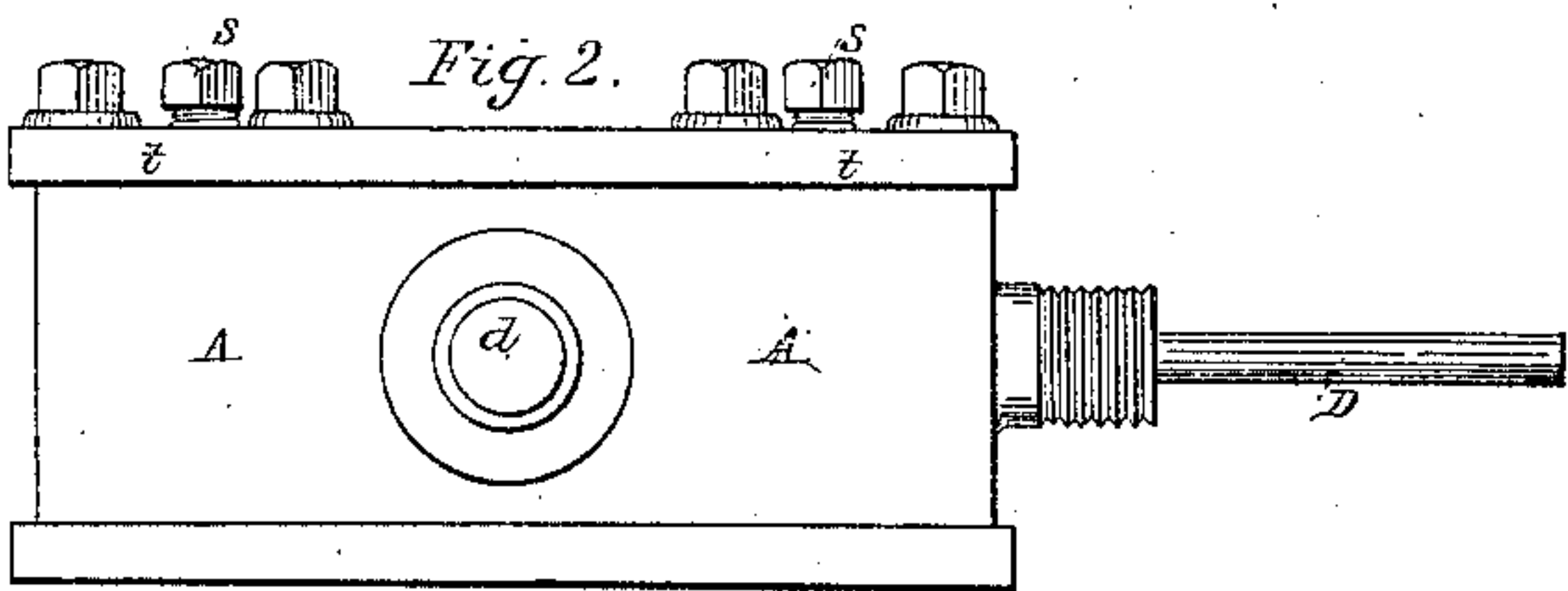


Fig. 6.

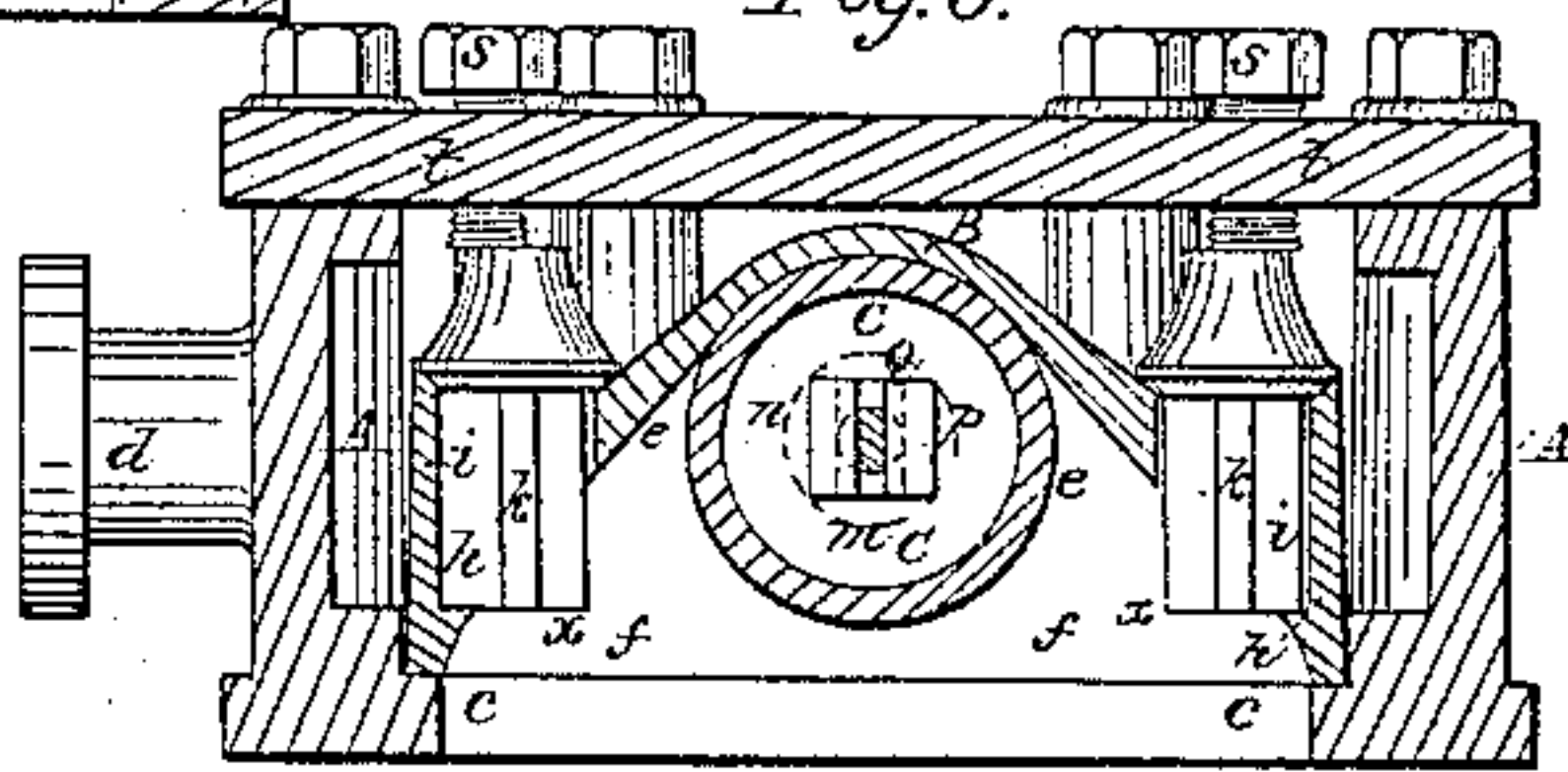


Fig. 3.

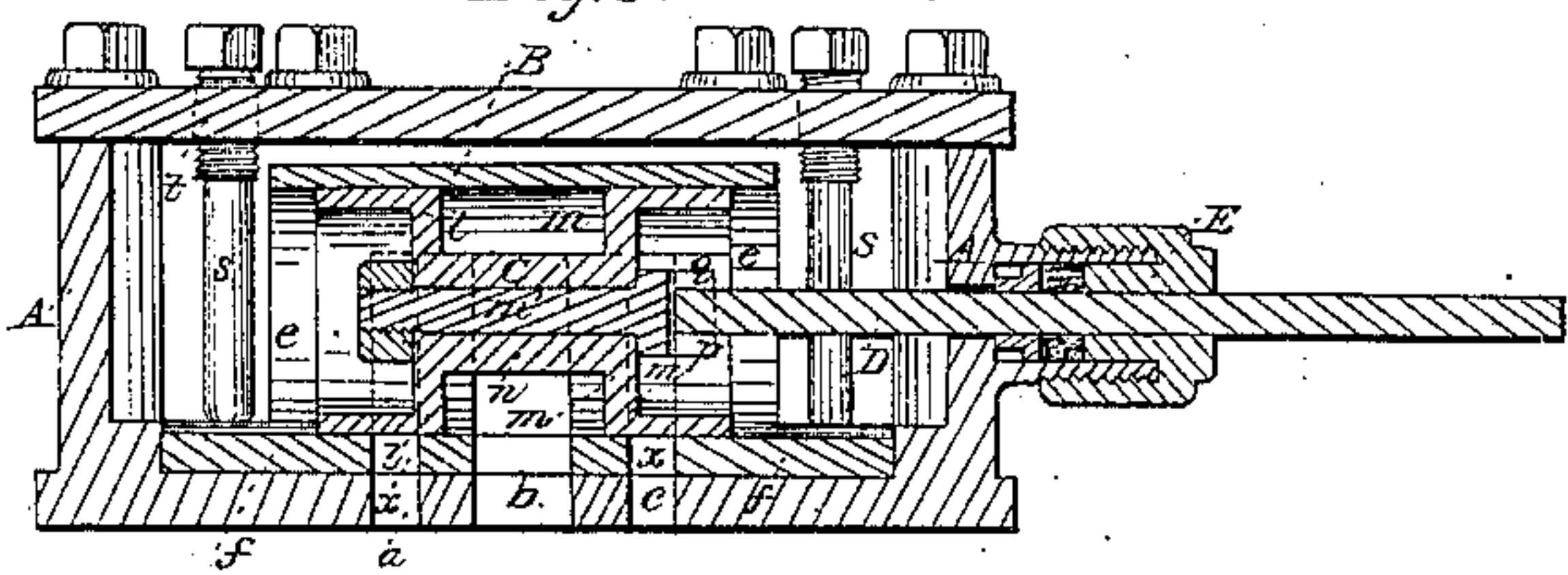
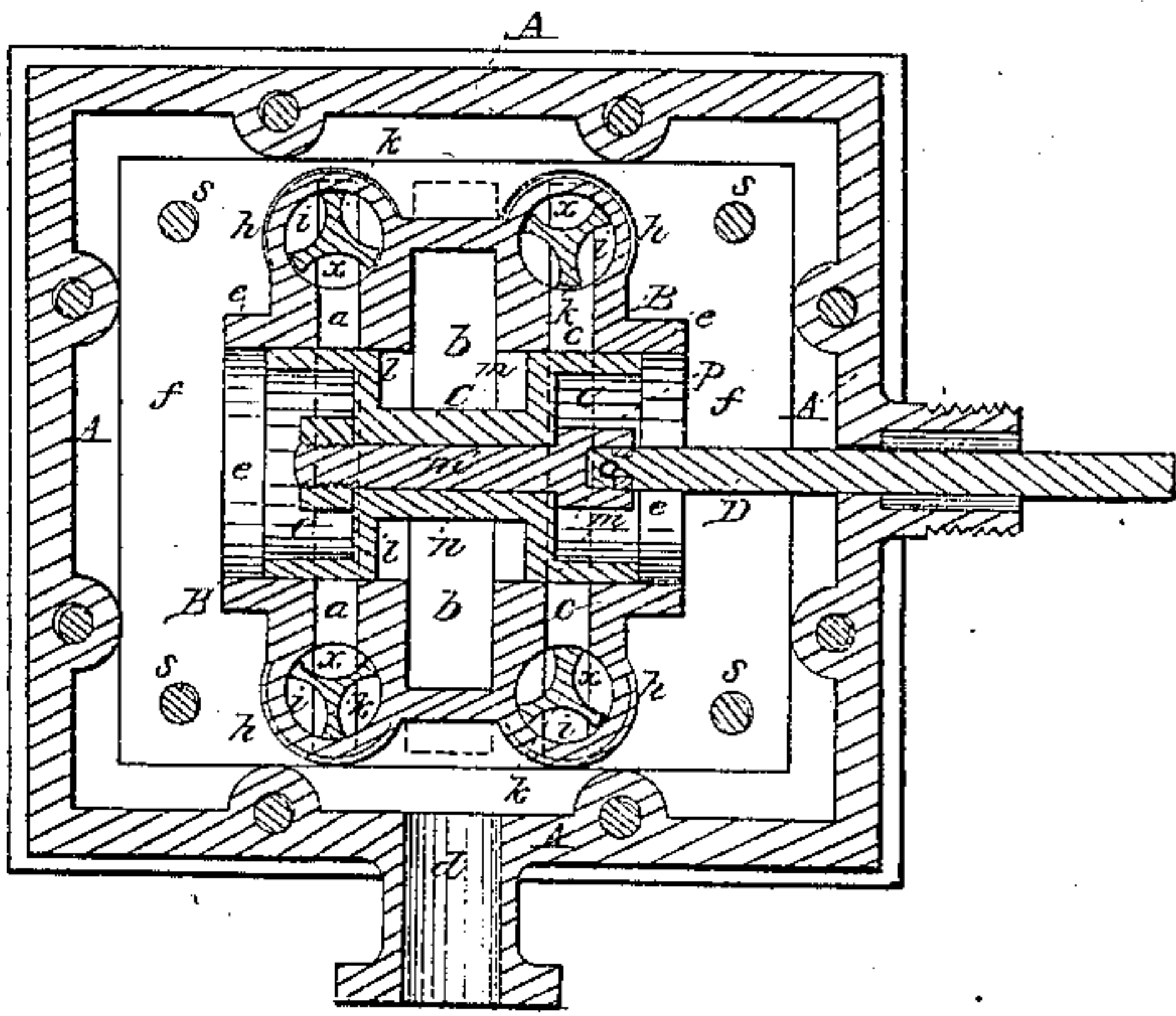


Fig. 7.



UNITED STATES PATENT OFFICE.

A. R. MORRILL, OF NORTHFIELD, VERMONT.

VALVE OF STEAM-ENGINES.

Specification of Letters Patent No. 22,192, dated November 30, 1858.

To all whom it may concern:

Be it known that I, ALDEN R. MORRILL, of Northfield, in the county of Washington and State of Vermont, have invented a new or Improved Valve Apparatus for Steam-Engines; and I do hereby declare that the same is fully described and represented in the following specification and the accompanying drawings, of which—

Figure 1, is a top view, Fig. 2, a side elevation, Fig. 3, a vertical and longitudinal section, and Fig. 4, a vertical and transverse section of a steam chest containing my invention. Fig. 5, is a top view of it as it appears without its cover. Fig. 6, a vertical and transverse section taken through two of the safety valves. Fig. 7, is a horizontal section taken through the piston valve rod.

The nature of my invention consists, first, in a peculiar arrangement or application of a cylindrical case open at both ends, with a double headed piston valve and the steam chest; second, in an arrangement of the valve case, viz. so as to rest directly on the bottom of the steam chest without being suspended from its top; third, in an improved arrangement of the safety valves and their conducting passages with reference to the double headed or slide valve.

In the drawings above mentioned, A denotes a steam chest, which when used is to be applied in the usual or any proper manner to the side of a steam engine cylinder so as to connect with its induction and education steam passages. The ports of the steam chest are shown at *a, b, c*, the first and last (viz. *a*, and *c*,) being for the induction of steam, while the middle one, (*b*) is for the education of it. The pipe or passage for the introduction of steam into the steam chest is shown at *d*.

Resting on the bottom of and arranged within the steam chest is the valve case, B, which consists of a cylindrical tube, *e*, open at both ends, and supported on a base plate, *f*, to which it is connected in the process of casting the two. On opposite sides of this cylinder or tube, *e*, are ears or projections *h, h*, which rise up from the base plate, *f*, and respectively contain chambers, *i, i*, which at bottom open into the ports, *a, c*, through passages *x, x*, entirely separate from the piston valve, and arranged on opposite sides of it. Each of the chambers, *i*, is open at top and receives a weighted or heavy safety

valve, *k*, which is arranged therein as shown in the drawing.

Each of the ports opens directly into the cylindrical or tubular valve case while the latter at its two ends opens into the steam chest and contains a piston valve, C, formed with two heads or cylinders, *l, m*, connected by a short cylinder or bar, *n*. The piston valve rod is shown at D as working through a stuffing box, E, and as provided with a dovetail, *o*, at its inner end to enter a dovetail socket, *p*, applied to the piston valve or a rod, *m'*, extended through it as shown in Figs. 3, and 7. The mode of connection of the piston valve and its rod or stem enables the valve and its case to be easily detached from the stem without the necessity of detaching the latter from the stuffing box. The valve case is kept down upon the bottom of the steam chest by means of screw pins, *s, s, s, s* which pass down through and screw into the cap plate *t*, of the steam chest, and rest on the base plate of the valve case.

In the operation of the said invention, the steam has a free passage to the piston valve through the ends of its tubular case, the safety valves enabling the steam from the engine cylinder to return to the boiler in case of sudden reversal of the action of the engine.

The advantages of my invention are as follows: First. While I retain all the useful qualities of the "balanced steam valve" I dispose to better advantage the openings for the introduction of steam from the steam chest into the ports. Second. I also obtain a more durable valve apparatus (in comparison with the flat slide valve) one not requiring so nice adjustment to render it practically operative; also, one which can be applied in all or nearly all valve chests of either locomotive or stationary steam engines without requiring any essential modification of them. Third. By the employment of the cylindrical or tubular valve case open at both ends the expansion and contraction of the metal occasioned by the variations of the heat of the steam will not affect the proper operation of the valve, as they do with respect to a plate valve and its covering plate. Fourth. The valve case by always resting on the bottom of the steam chest and not on a moving valve is not so liable to wear and leak steam between it and the bottom of the chest. By arranging the

passage for the steam to the safety valves so as not to pass through the piston valve there is no danger of the return steam being blocked or interrupted by the slide valve when the engine is reversed.

5 I am fully aware of the invention or devices claimed in the United States patents numbered 11,607, and 10,454. I do not claim such, nor do I claim a piston valve having
10 two heads, nor do I claim arranging a steam chest between two cylindrical valve cases, each of which not only has a passage leading from its outer end to the steam cylinder, but a separate eduction passage, the same being
15 as shown in the United States patent, numbered 13,276. In my improvement but one tubular valve case is used and it is separate from, and placed within the steam chest so that the latter extends entirely around it,
20 and opens freely into both opposite ends of it; and the said valve case for its double headed valve has but one exit port *b*, arranged close to and directly between the induction passages and ports *x a*, *x a*, as
25 shown in Fig. 3, and made to communicate with the space between the two heads of the piston valve.

Therefore, what I claim is—

30 1. My improved construction and arrangement of the valve case its induction and eduction ports with respect to the steam chest and the double headed piston made in

manner and to operate within such valve case substantially as described.

2. I also claim when the valve case is made 35 tubular, and open at both ends as described, making it separate from the steam chest and so as to rest on the bottom of the latter and confining it therein by means of screw bolts *s, s*, extending through the top plate of the
40 steam chest and made to rest on the said valve case essentially as above described.

I do not claim the application of safety valves within a steam chest and to a covering plate and slide valve in manner as shown 45 in the said Patent No. 11,607, that is so that the steam in order to move the safety valves has to pass through the slide valve, but

3. I claim my improved arrangement of the safety valves and their conducting pas- 50 sages with reference to the double headed or slide valve, in which arrangement the steam in passing to the safety valves in order to raise them, does not pass through the double headed piston or slide valve, but through 55 passages *x x*, arranged on the opposite sides thereof as described.

In testimony whereof, I have hereunto set my signature.

ALDEN R. MORRILL.

Witnesses:

LEANDER GASTER,
ELIJAH SMITH.