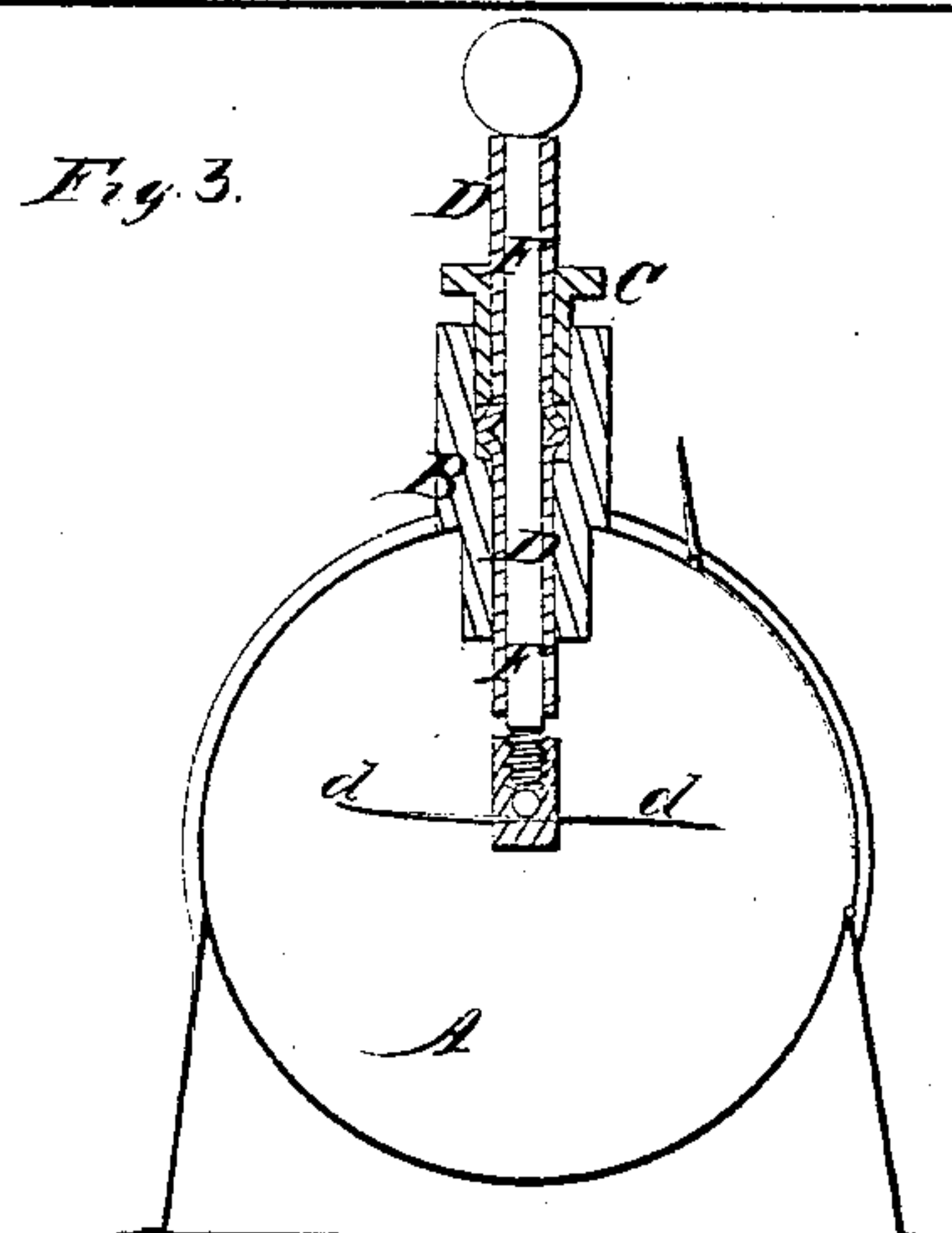
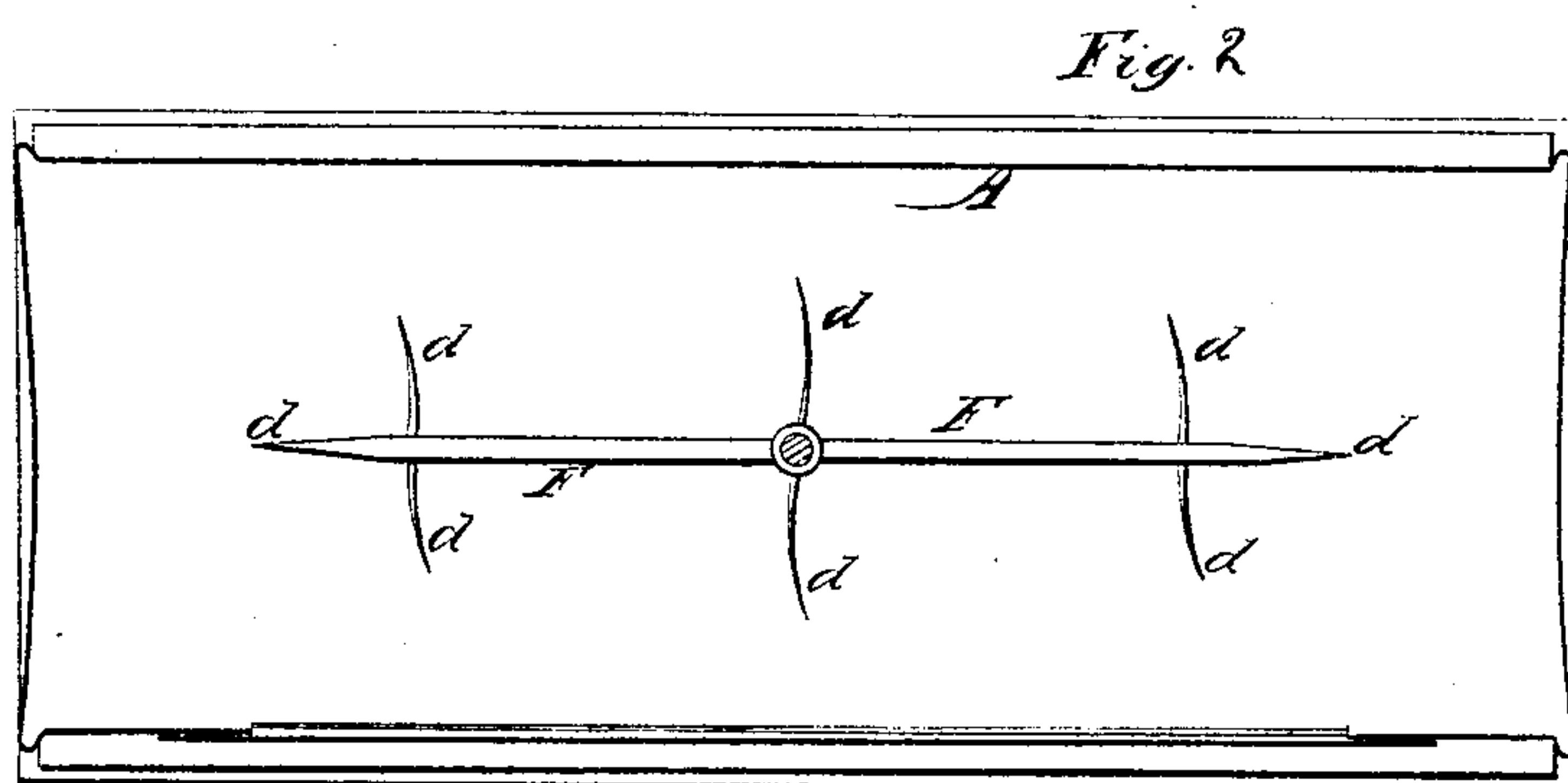
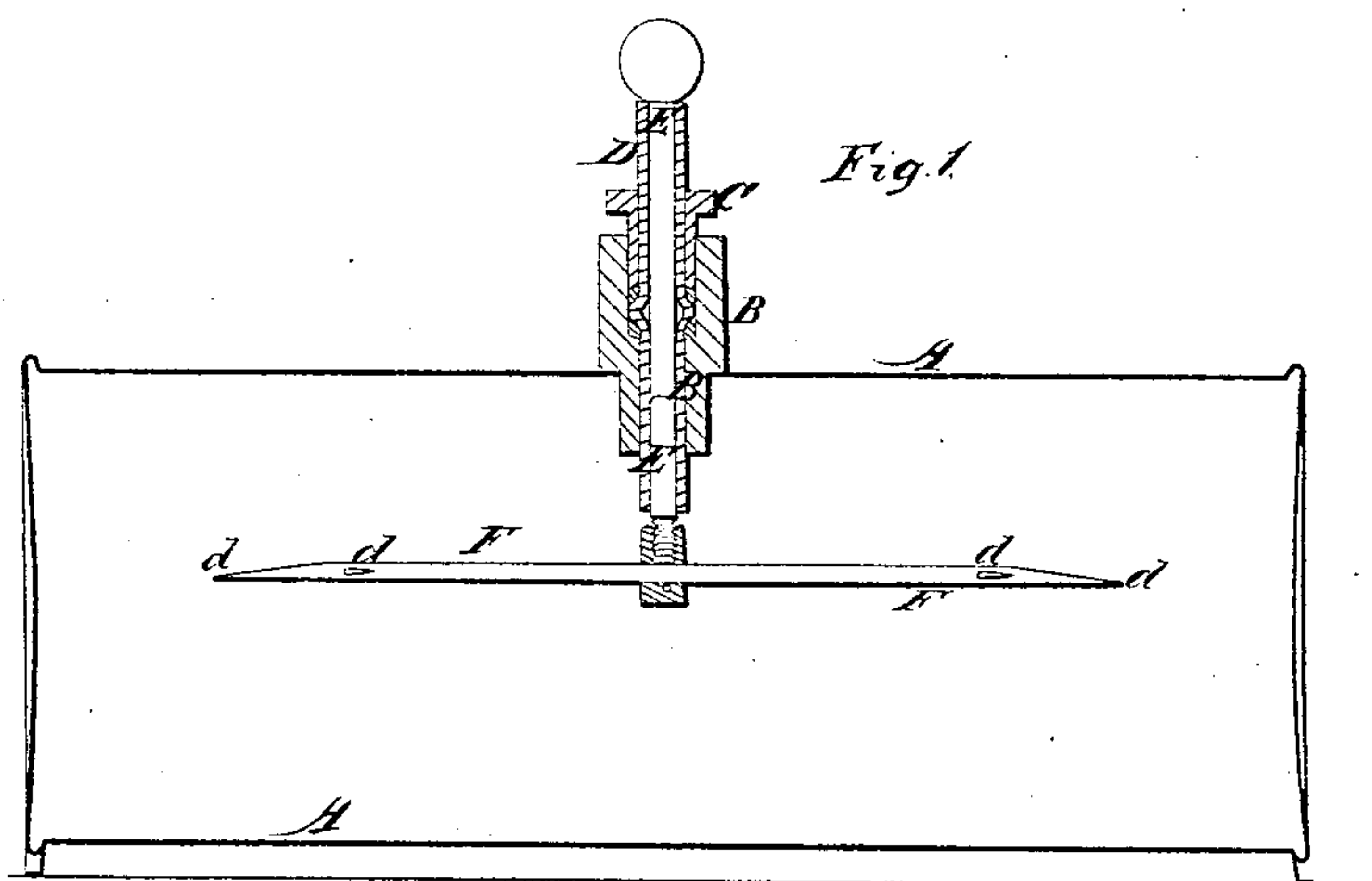


R. L. Lloyd,
Steam Safety Valve.
N^o 22,271. Patented Dec. 7, 1858.



UNITED STATES PATENT OFFICE.

JANE H. LLOYD, OF PHILADELPHIA, PENNSYLVANIA, ADMINISTRATRIX OF RICHARD L. LLOYD, DECEASED, ASSIGNOR TO GEO. T. PARRY, OF SAME PLACE.

PREVENTING EXPLOSIONS IN STEAM-BOILERS.

Specification of Letters Patent No. 22,271, dated December 7, 1858.

To all whom it may concern:

Be it known that RICHARD L. LLOYD, of the city of Philadelphia and State of Pennsylvania, did in his lifetime invent a new and Improved Mode of Preventing the Explosion of Steam-Boilers; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawing and to the letters of reference marked thereon.

The invention of the said RICHARD L. LLOYD consists in placing, within a steam boiler, a metallic conductor, made to communicate with the outside, for the purpose of maintaining an electrical equilibrium between the inside of the boiler and the outside thereof, and thus preventing the explosion of the boiler, when the water becomes low and the plates unduly heated.

In order to enable others to practice this invention, I will now proceed to describe the mode adopted by the said RICHARD L. LLOYD in carrying it out.

The said LLOYD in his life time ascertained by actual experiment, that, by placing a metallic conductor within a steam boiler and carrying it through an insulator to the outside, the plates of the empty boiler might be reduced to a red heat and cold water suddenly forced into the interior, without that violent disruption of the plates ensuing, which the numerous, detailed accounts of steam boiler explosions would suggest as the certain result of such an experiment. The said LLOYD attributed the success of his experiments to the following causes: Knowing that numerous disastrous explosions of steam boilers had occurred, which could not be attributed to an undue increase of pressure within the vessels, to the malformation of the same, or to the inferior quality of the material employed in their construction, he based his experiments on the generally accepted hypothesis, that, when steam is exposed to red hot plates, a gas or gases of an intensely explosive nature are generated, and that these possess the peculiarity, common to other explosive gases, of being ignitable only by a flame or an electric spark and not by contact with red hot plates. In generating steam, electricity is given out, which electricity the said LLOYD supposed to be retained within the boiler, its escape being prevented by a

lining of mineral substance, deposited in the interior of all steam boilers to a thickness depending on the nature of the water used. Now as long as this film or lining of non-conducting substance remained entire, no ignition or explosion of the gases could take place, even should the plates of the boiler be red hot. But, should the non-conducting lining become broken in any part, this broken space forms a communication between the negative exterior of the boiler and the positive electricity within the same, and an electric spark and consequent explosion of the gases ensues.

On reference to the drawing, which forms a part of this specification; Figure 1, represents a sectional view of an ordinary, cylindrical steam boiler, with the apparatus of the said R. L. LLOYD, for preventing explosions; Fig. 2, a section plan of Fig. 1; Fig. 3, a transverse sectional elevation.

A is the boiler, to the top of which is secured the socket B, the latter being arranged to receive the gland or follower C.

D is an insulator of glass, or other suitable non-conducting material, and consists of a tube with an enlargement or collar about the middle, this collar fitting into the socket and being surrounded by packing contained in the recess between the gland and the bottom of the socket after the manner of the ordinary stuffing box, so that the insulator, which projects above the gland and into the boiler, is maintained stationary and steam tight. In the interior of the boiler is a metallic conducting rod F, furnished with any convenient number of attracting points *d*, *d*, and attached to and suspended from a vertical rod E, which fits accurately in, and passes through the insulator D to the exterior of the boiler. It will be seen without further description that, by the above described device, an electrical equilibrium may be maintained between the interior and exterior of the boiler, thus obviating the danger of any ignition of the explosive gases through electric sparks.

Having now described the principle of the said invention, and the manner in which the said LLOYD carried it into effect, I wish it to be understood, that I do not desire to limit the claim of the invention to such especial mode, as modifications of the same may

be necessary in adapting it to different forms of steam boilers, but

I claim, as the invention of the said RICHARD L. LLOYD, and desire to secure by Letters Patent,

Placing within a steam boiler a metallic conductor, arranged to communicate with the outside of the said boiler substantially in the manner herein set forth, in order to maintain an electrical equilibrium between the inside of the boiler and outside thereof,

or with any matter surrounding or in connection therewith, for the purpose specified.

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses.

JANE H. LLOYD,
Administratrix of the estate of Richard L. Lloyd, deceased.

Witnesses:

RICHARD C. LLOYD,
JANE L. MACKY.