

(No Model.)

J. LOFTUS.
SAFETY VALVE.

No. 446,782.

Patented Feb. 17, 1891.

Fig. 1.

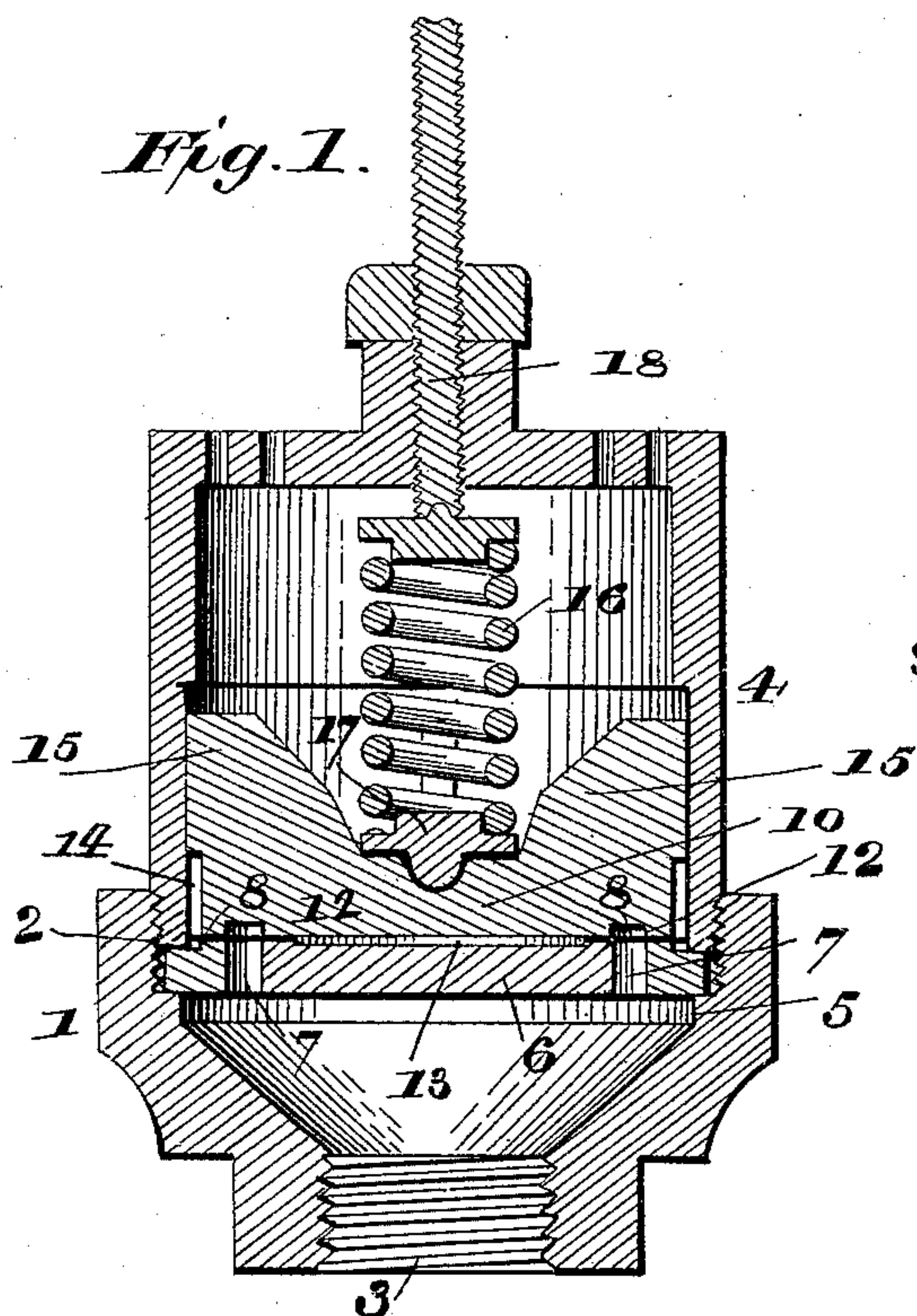


Fig. 2.

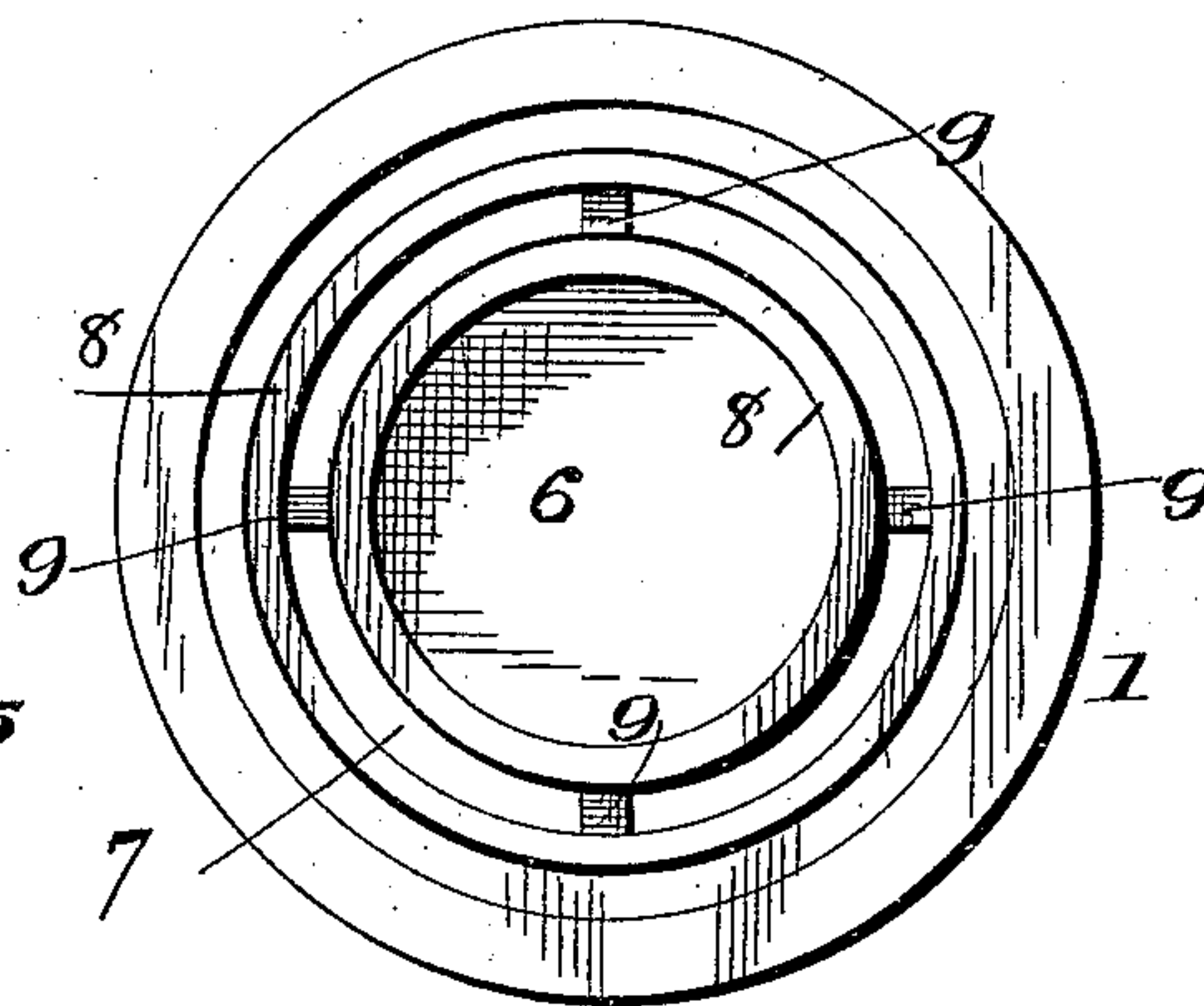


Fig. 3.

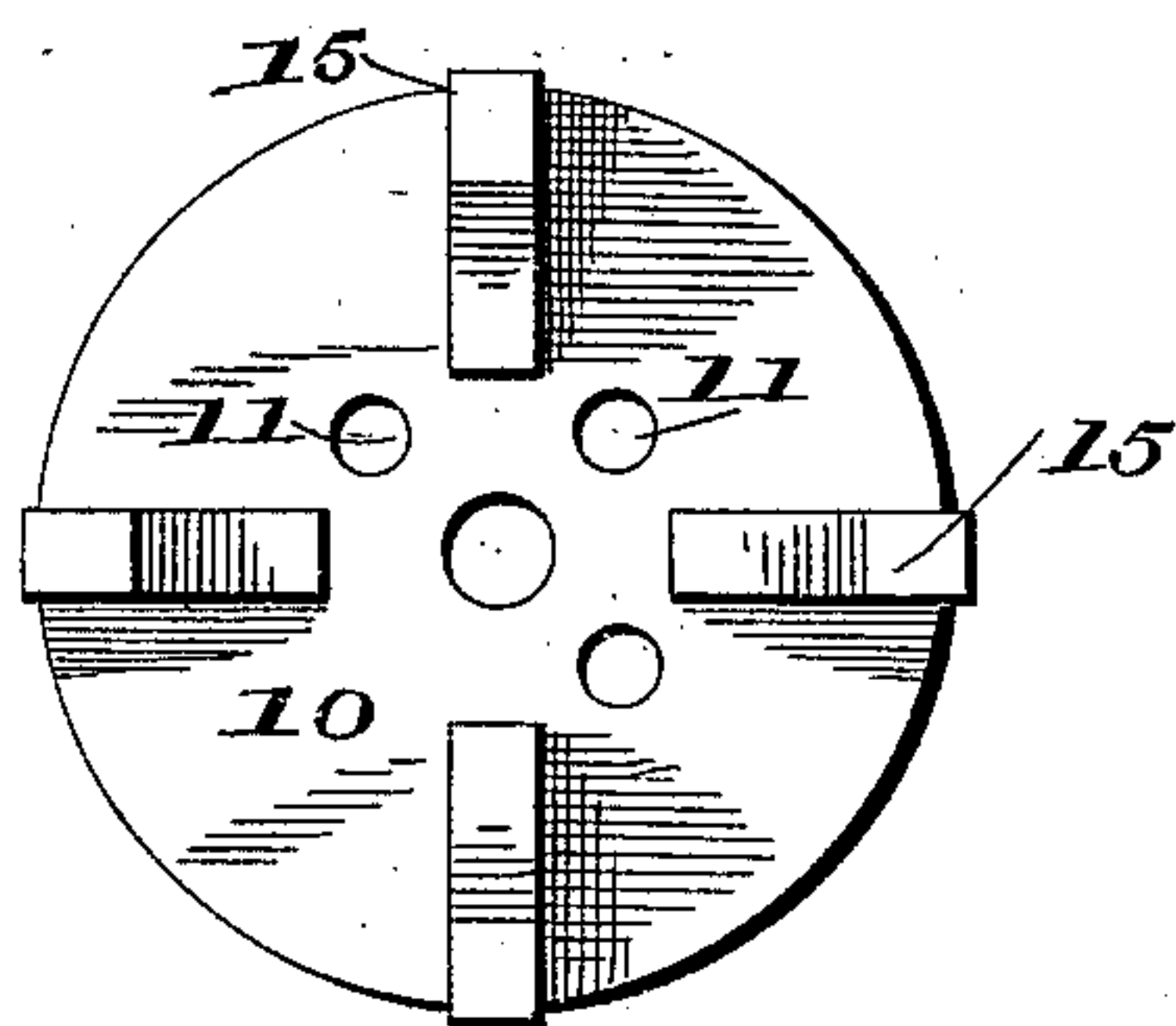
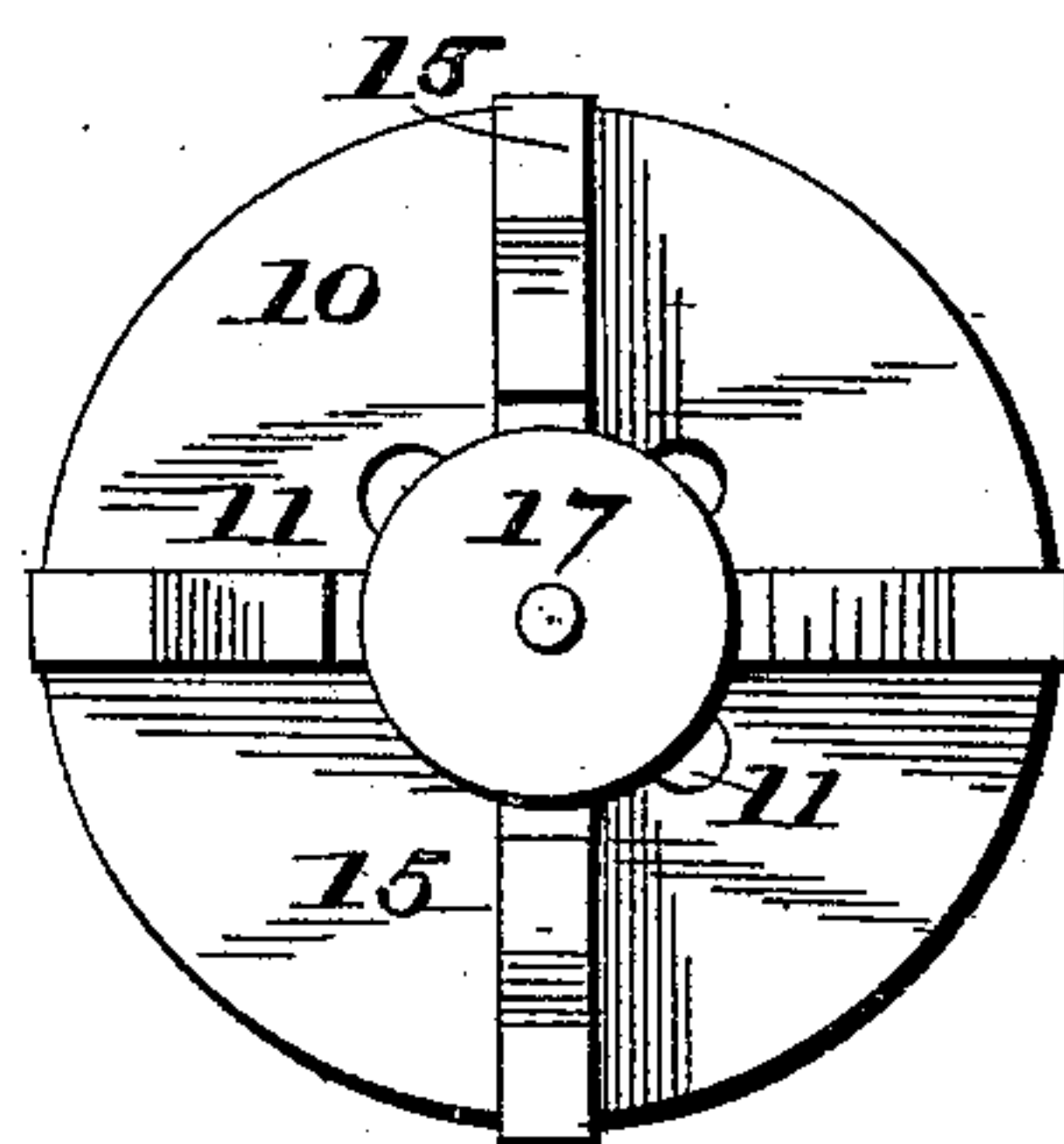


Fig. 4.



WITNESSES:

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UNITED STATES PATENT OFFICE.

JOHN LOFTUS, OF ALBANY, NEW YORK, ASSIGNOR OF ONE-HALF TO EZRA W. SMITH, OF SAME PLACE.

SAFETY-VALVE.

SPECIFICATION forming part of Letters Patent No. 446,782, dated February 17, 1891.

Application filed September 8, 1890. Serial No. 364,339. (No model.)

To all whom it may concern:

Be it known that I, JOHN LOFTUS, a citizen of the United States, and a resident of Albany, in the county of Albany and State of New York, have invented certain new and useful Improvements in Safety-Valves; and I do hereby declare that the following is a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to improvements in safety-valves for steam-boilers.

The object of the invention is to provide a simple and economical safety-valve which shall be very sensitive in its action, quickly opening and closing under varying boiler-pressures. The construction is also such that fluttering of the valve is prevented, thus rendering its operation more uniform and efficient.

The invention consists in the novel construction and combination of parts hereinafter fully described, and specifically pointed out in the claims.

In the accompanying drawings, Figure 1 is a central sectional view of a safety-valve constructed in accordance with my invention. Fig. 2 is a plan view with the valve-casing removed. Fig. 3 is a plan view of the valve. Fig. 4 is a plan view of valve with spring in position.

In the said drawings, the reference-numeral 1 designates the base of the valve, screw-threaded at 2 and provided with a central screw-threaded orifice 3 at its lower end, by which it is connected with a steam-boiler.

The numeral 4 designates the valve-casing screw-threaded at its lower end to engage with the corresponding threads in the base 1. The upper end of this casing is closed and provided with a number or series of perforations for the escape of the steam.

The base 1 near its upper end is provided with an annular shoulder 5 to receive the disk 6, the rim of which is held between the said shoulder and the bottom of the casing, whereby it is securely retained in position.

This disk is provided with an annular opening 7 and two upwardly-projecting flanges 8, which form seats for the valve, hereinafter described.

9 designates ribs which connect the inner and outer portion of the disk.

The valve proper consists of an annular disk 10, somewhat smaller in diameter than disk 6, and has two downwardly-projecting annular flanges 12, forming seats which coincide and register with the flanges 8 of the disk 6. It will thus be seen that there is a central space 13 formed between the two disks and an annular space 14 between disk 10 and the casing. The disk 10 is provided with a series of holes 11 at one side of the center thereof, which open into the casing and also communicate with the space 13. Upon the upper side of the disk 10 are formed a series of upwardly-projecting radial wings 15, which serve to steady and guide the valve in its movement.

The numeral 16 designates a coiled spring, one end of which bears against a washer 17, resting upon valve 10, while the other end bears against a washer interposed between the spring and the end of a screw-rod 18, passing through the end of the casing. This screw-rod serves to regulate the tension of the spring.

The operation is as follows: The parts being in proper position, the tension of the screw is adjusted to the pressure at which it is desired the boiler shall blow off. When the pressure exceeds the safety limit, or that to which the spring is adjusted, the valve 10 will be lifted off its seat, allowing the steam to escape through the annular opening in disk 10 into the steam-space 13. Steam will also escape through the space 14 into the casing. The steam-pressure in the space 13 will still further raise the valve, and thus relieve the boiler of excessive pressure. By providing the escape-openings 11 at one side of the center of disk 10 there will be a greater pressure at one side than at the other, causing the valve to be tipped or tilted, so that the wings 15 will bind slightly against the casing, and thus prevent the valve from fluttering. When the steam-pressure has decreased until its

force is counteracted by the coiled spring, the valve will be forced back to its seat and closed.

It will be seen that the casing acts as a muffler, which obviates the disagreeable noise incident to blowing off. The valve 10 acts as a piston, and by reason of its construction, in connection with the other parts, is very sensitive in its action, quickly responding to variations in boiler-pressure.

10 Having thus described my invention, what I claim is—

1. In a safety-valve, the combination, with the base and casing, of a disk having an annular opening and two upwardly-projecting flanges on each side thereof, forming valve-seats, the valve having corresponding downwardly-projecting flanges corresponding with the flanges in the disk and having holes or openings at one side of the center and upwardly-projecting radial wings, a screw-rod 20 passing through the end of the casing, and a coiled spring interposed between the valve and said rod, substantially as described.

2. In a safety-valve, the combination, with the base having screw-threaded upper end 25 and an annular shoulder, the casing connected with said base, closed at its top, and provided with a number of escape-openings, the disk having annular opening, upwardly-projecting annular flanges, and connecting-ribs, said disk 30 being confined between the shoulder in the base and the end of the casing, of the valve having the annular downwardly-extending flanges seated upon the flanges of the disk, a series of holes at one side of the center thereof and upwardly-projecting radial wings, the regulating-screw, the coiled spring, and the washers against which the ends of the spring bear, substantially as described. 35

In testimony that I claim the foregoing as 40 my own I have hereunto affixed my signature in presence of two witnesses.

JOHN LOFTUS.

Witnesses:

TIMOTHY G. HAYES,
H. E. COOLY.