

(No Model.)

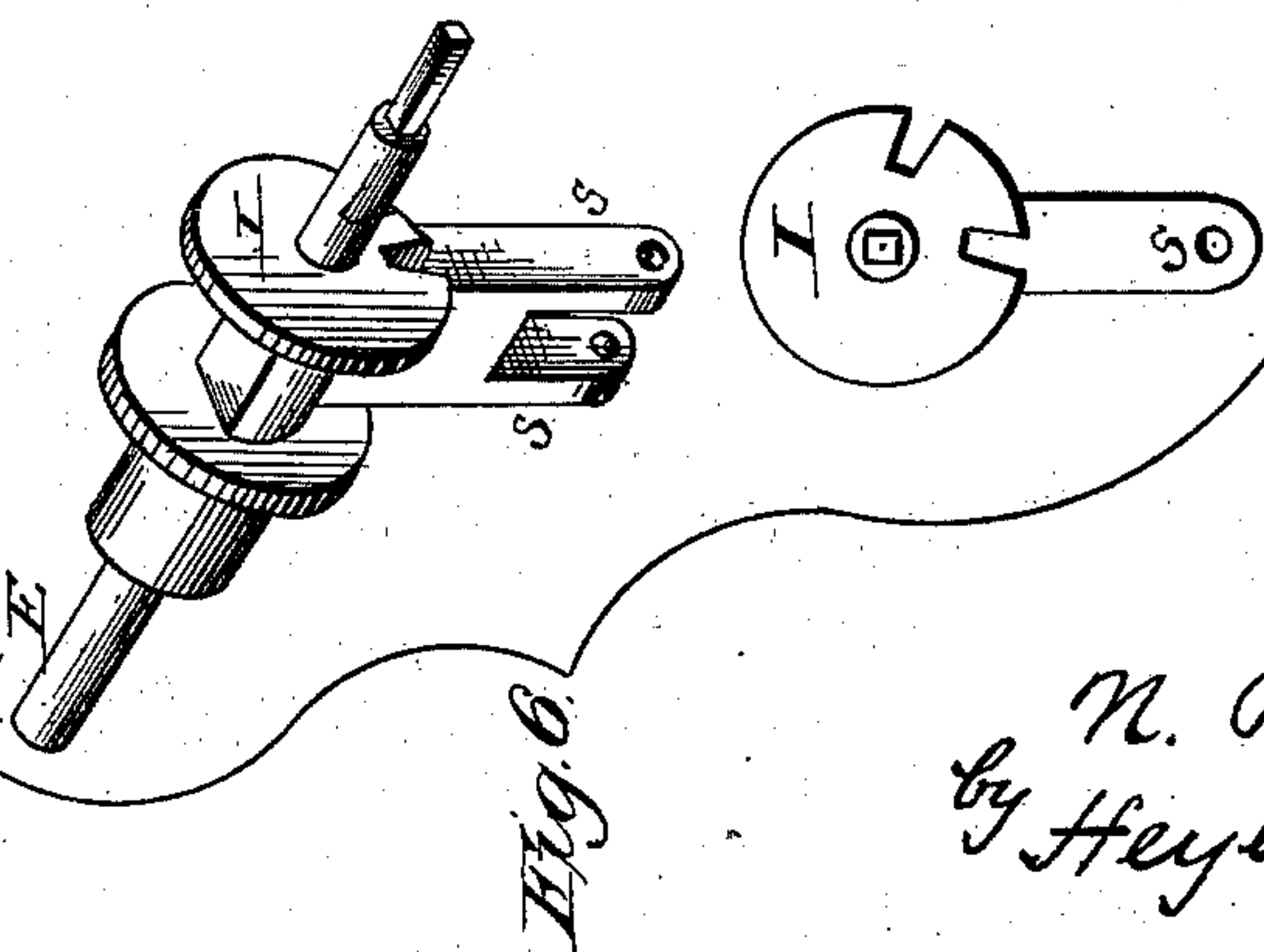
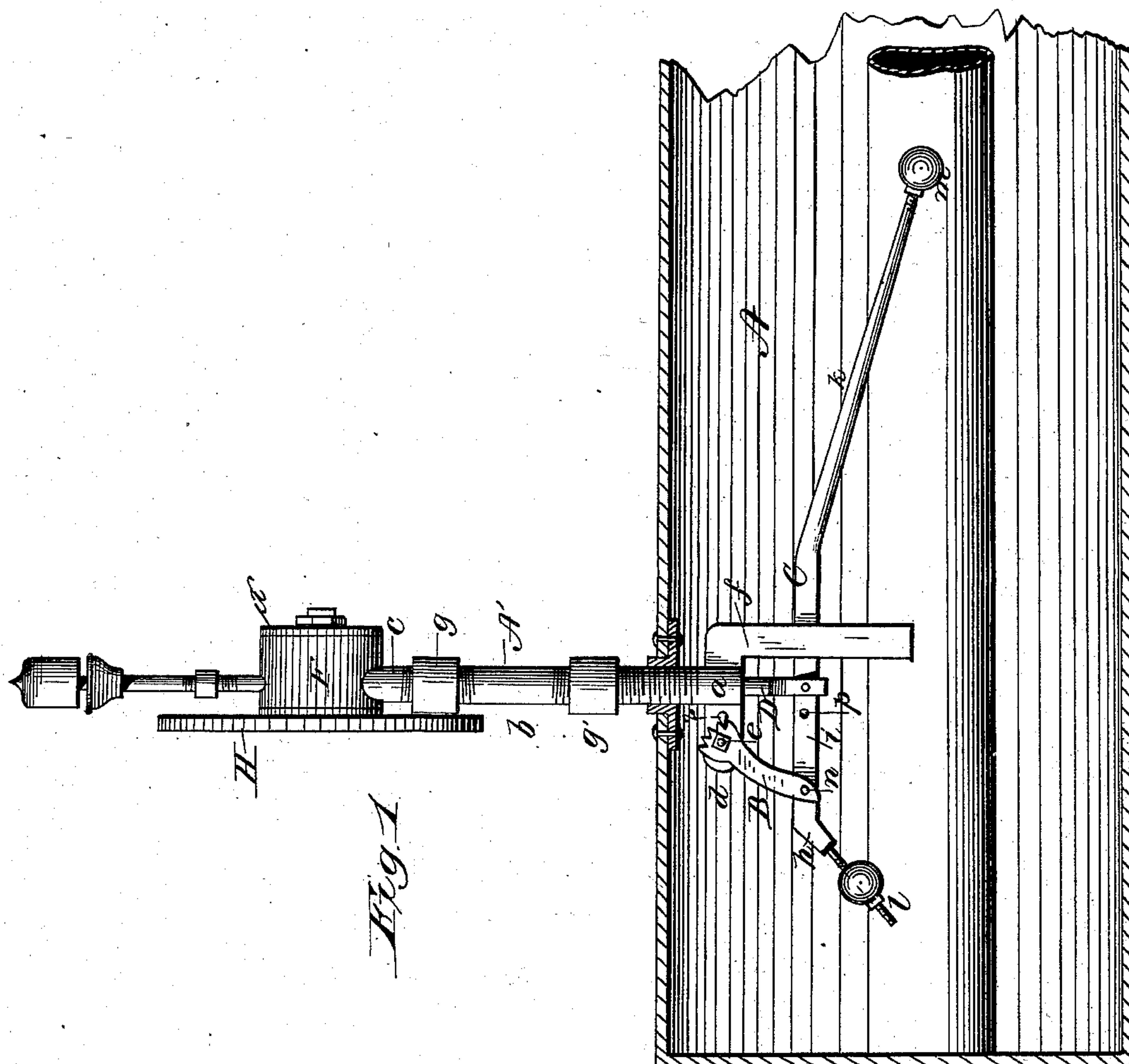
2 Sheets—Sheet 1.

N. B. POTTIER.

ATTACHMENT FOR STEAM BOILERS.

No. 258,113.

Patented May 16, 1882.



WITNESSES

Witnessed
Frank L. Curand
J. M. Vznaga.

INVENTOR

N. B. Pether
by Heylmunt Kang
Attorney S.

(No Model.)

2 Sheets—Sheet 2.

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Fig. 2.

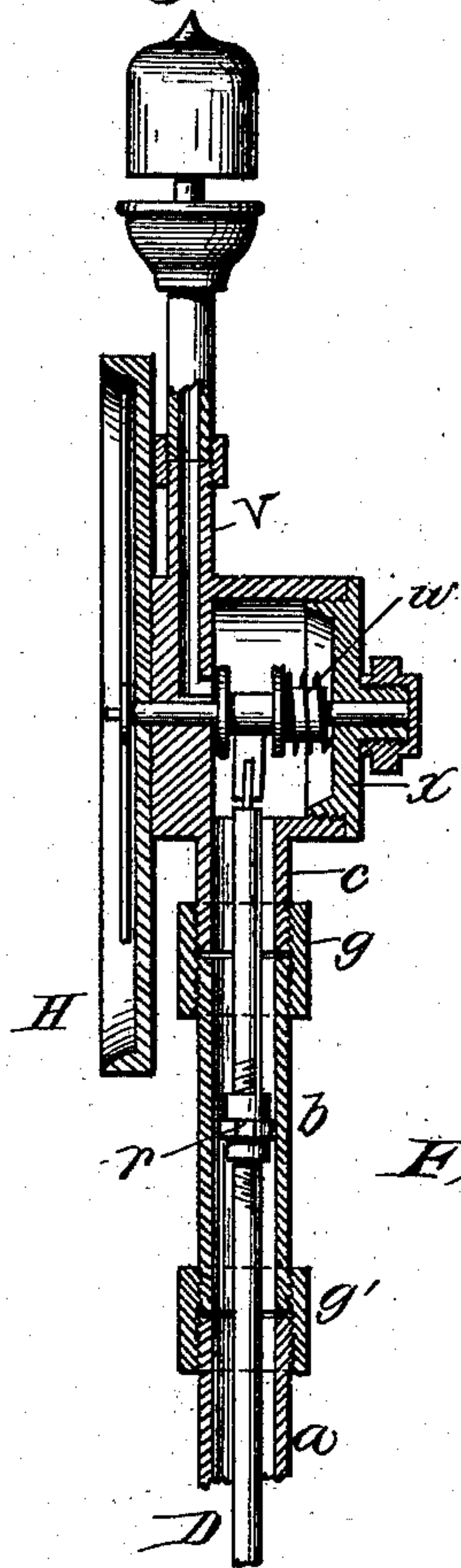


Fig. 3.

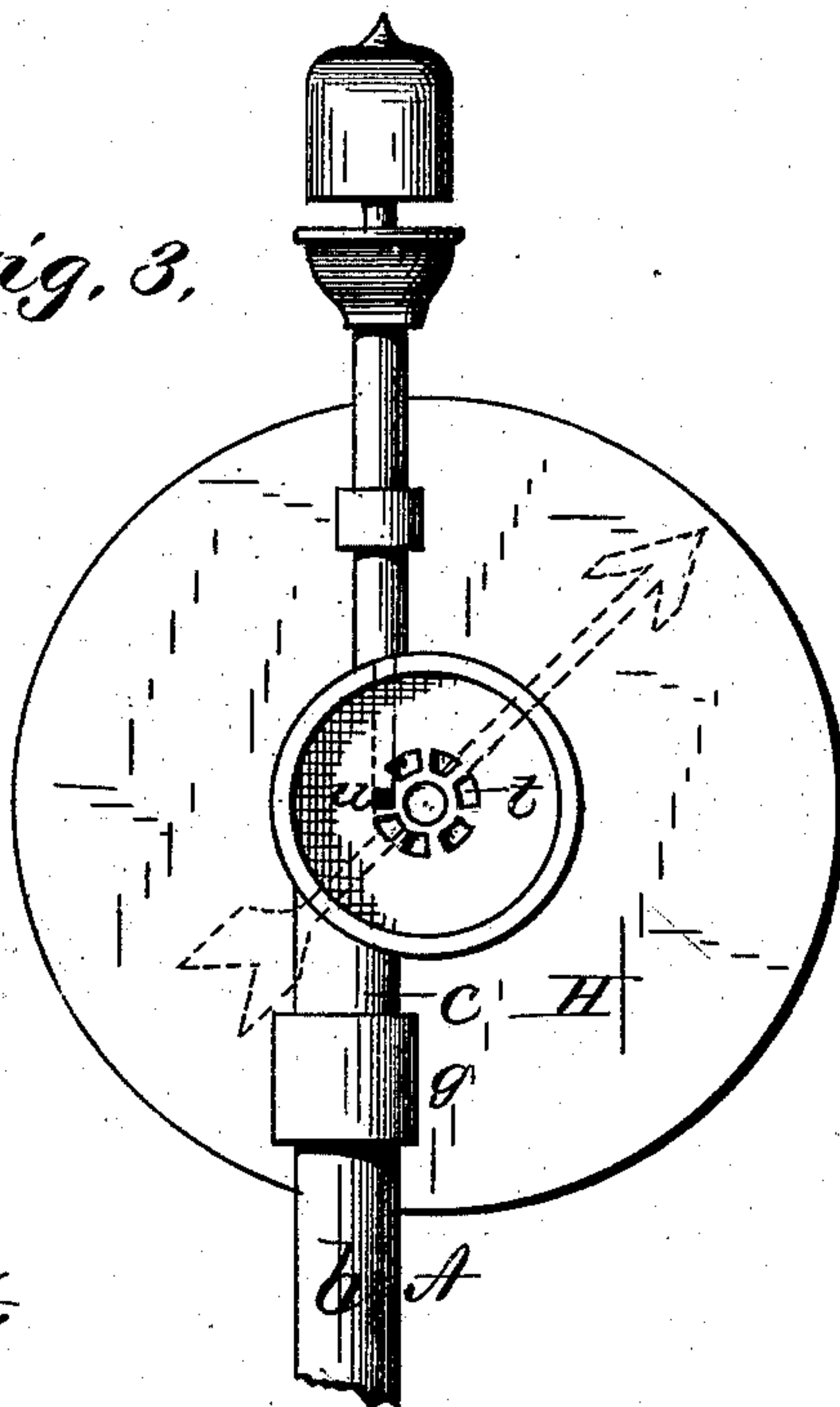


Fig. 4.

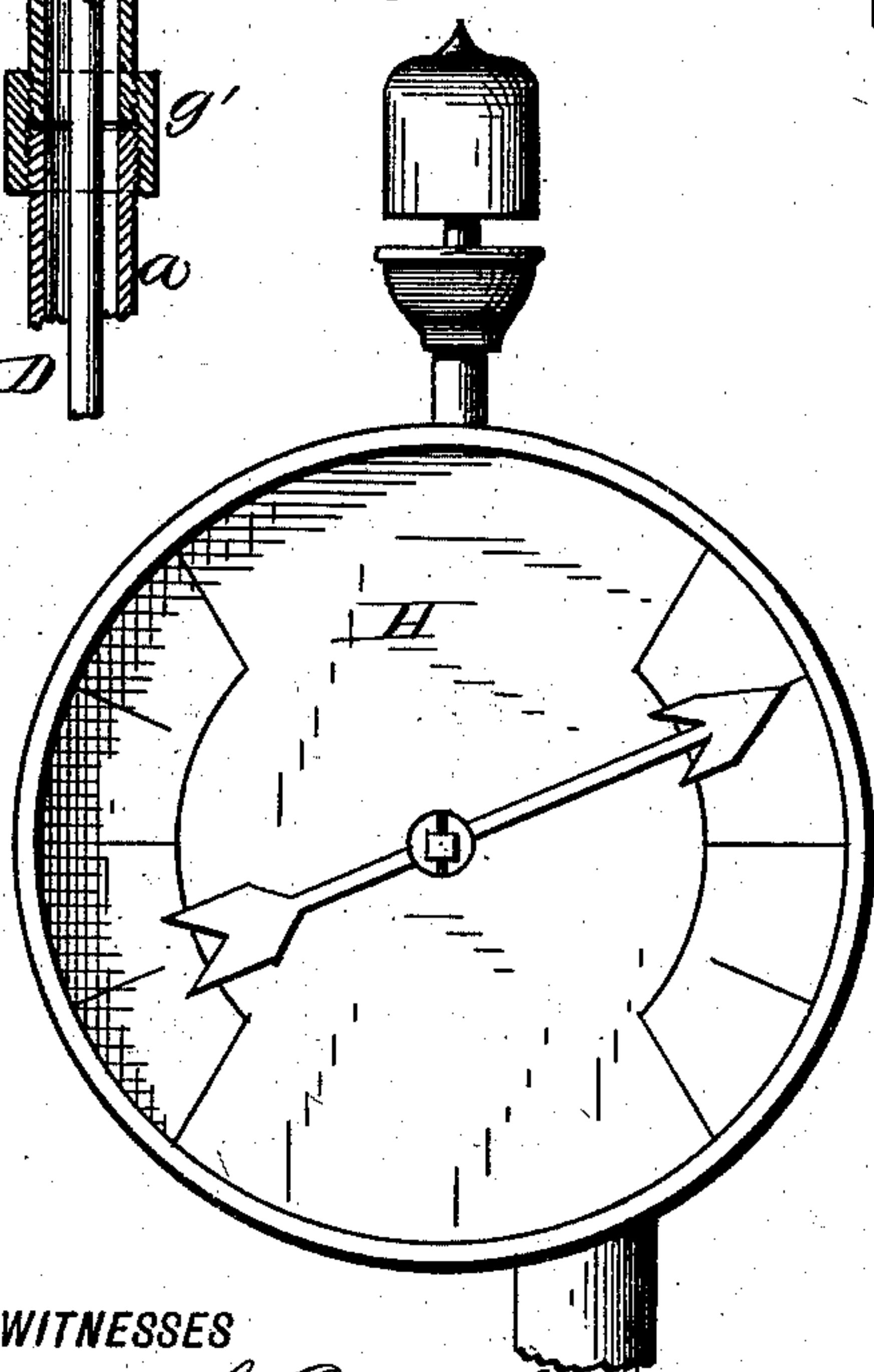
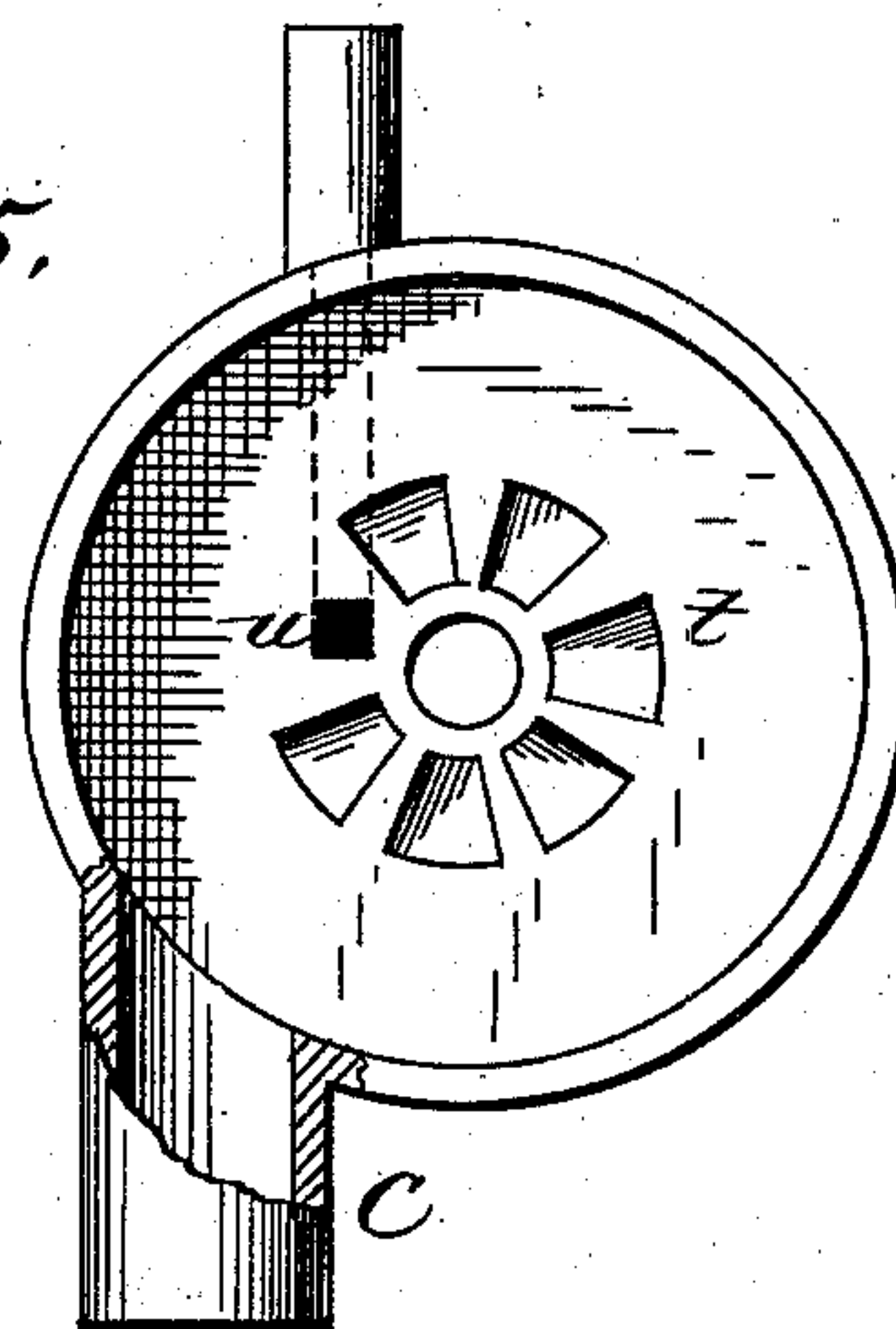


Fig. 5.



WITNESSES
Frank L. Curand
J. M. Vznaga.

INVENTOR
N. B. Pottier
by Heylman & Kane
Attorneys

UNITED STATES PATENT OFFICE.

NAPOLEON B. POTTIER, OF CHARLESTON, WEST VIRGINIA, ASSIGNOR OF
ONE-HALF TO DELAFIELD DU BOIS, OF SAME PLACE.

ATTACHMENT FOR STEAM-BOILERS.

SPECIFICATION forming part of Letters Patent No. 258,113, dated May 16, 1882.

Application filed January 23, 1882. (No model.)

To all whom it may concern:

Be it known that I, NAPOLEON B. POTTIER, a citizen of the United States of America, residing at Charleston, in the county of Kanawha and State of West Virginia, have invented certain new and useful Improvements in Attachments for Steam-Boilers; and I do hereby declare the following to be 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.

This invention relates to attachments for steam-boilers; and its objects are to provide automatic mechanical means to indicate the height of water in the boiler, in order to give an alarm or notice, by the blowing of a steam-whistle, whenever the water in the boiler falls below or rises above a certain or predetermined line, and to show by a dial whether the water is at a proper level or above or below the line of safety.

My invention consists in the novel construction and combination of parts, as will be hereinafter more fully set forth.

In the accompanying drawings, making a part of this specification, Figure 1 is a sectional view of a portion of a steam-boiler, showing my improvements attached thereto. Fig. 2 is a vertical sectional view of a valve and dial mechanism. Fig. 3 is a rear view, showing the valve-seat and port to the whistle. Fig. 4 is a front view of the dial. Fig. 5 is an enlarged view of the valve-seat and its connections, and Fig. 6 represent detailed views.

The letter A represents an ordinary longitudinal-flue steam-boiler, to which in this example the improvements are applied. The letter A' represents a metallic tube composed preferably of sections *a b c*. The lower section, *a*, is formed at its lower end with the side ears or lug, *d*, and downward-extending guide-arms *f*. The upper section, *c*, of the tube is preferably cast with the steam box or chamber, and enters it at the side, substantially as shown in Fig. 5 of the drawings. These sections composing this tube are connected by couplings or collars *g g'*, having female screws. The lower one of these collars serves as an adjusting means in raising or lowering the lever and connections to suit the requirements of the boiler.

To the side ear or lug, *d*, is pivotally at-

tached, by the coupling-pin *e*, curved arms B, formed on the upper ends with a segment provided with cog-teeth or notches, which engage with the pin in the lug, and serves as an adjusting means for setting the position and maintaining the lever in a set position in equilibrium. To the lower ends of these arms B is pivotally connected the lever C, thus affording the fulcrum of the lever. This lever C is formed substantially of the shape as shown in Fig. 1 of the drawings, and consists of the short arm *h*, the horizontal part *i*, and the inclined arm *k*, and on the end of the short arm is secured the balance-weight *l*, and on the other end of the lever is the float *m*. The balance-weight is adjustable on the short arm of the lever in any suitable manner, but in this instance by screw-threads, and it balances the long arm of the lever when it is suspended in position on the fulcrum *n* without having the float attached. The lever is made with a series of holes, as at *p*, for the purpose of adjusting the fulcrum to suit the connection, and to one of these holes is connected the vertical rod D, the fork portion of which is formed with a bolt-hole to register with the holes in the lever, and is connected by means of a bolt and nut or their equivalent. This connecting-rod D is preferably made in two sections, united by the screw-collar *r*, which also serves as a means to lengthen or shorten the same to secure proper adjustment between the float and valve.

The upper end of the rod is formed with a bolt-hole and is connected with the arms of the shaft E, carrying a valve located and operating in the steam box or chamber F, as seen in Fig. 2 of the drawings. The steam box or chamber is cast preferably, as already stated, with the upper section, *c*, of the tube, and formed with a valve-seat, *t*, port *u*, and upward-extending pipe *v*. In the solid face of the steam-box cap and in the face-plate are centrally-arranged journal-bearings for the valve-shaft E, to which the actuating-valve index-finger is attached, substantially as shown.

The letter H represents the face-plate or register, with graduated scale attached to the front of the steam-chamber in any suitable manner.

The valve I, mounted on the oscillating shaft

E, is ported from the periphery inward, as seen in Fig. 6, and balanced so as to operate with the port of the valve-seat in the steam-chamber. This shaft is also formed with a shoulder forming a bearing for the coil-spring *w* to rest against, and the other end of the spring having its bearing against the cap. This spring serves to press the valve onto the valve-seat for a close joint. The end of the shaft extending through the cap is formed with a slot intended to receive a screw-driver, and by moving the shaft to and fro under pressure the valve and seat will become tight-fitting, should leakage occur. The dial plate or register, which may be of any convenient construction, is put on the shaft E against the steam-box, and is so graduated on the face as to register the condition or level of the water in the boiler in connection with the pointer or index-finger.

The whistle, which is attached to the upper end of the pipe by a coupling-sleeve, is of usual construction.

The apparatus is secured in the boiler from the inside. The boiler-piece is secured through the shell of the boiler from the inside, and extends above the boiler far enough to make a nipple for the sleeve or collar to screw on, and the middle section of the pipe screws into this sleeve or collar.

The application of the several parts to their respective positions in connection with a steam-boiler is sufficiently demonstrated in the foregoing description, and it is readily seen that by the raising or lowering of the water-level the action of the lever is attained which raises or lowers the connecting-rod and thus actuates the valve, throwing the ports in the valve over the port in the valve seat and admitting the steam to the whistle for the alarm. The apparatus should be set in the boiler to suit the water-line of safety and the finger of the dial-register correspondingly on the dial-face.

The objects of porting the valve on the periphery inwardly, as shown, are to gain a larger area of opening with less travel of the valve—a very important point in this connection; also, avoiding a number of small openings or perforations in valve and seat that are liable to become “fouled” or choked, while the ports open at the periphery are slightly wider at the circumference of the valve than near the center, and the motion of the valve, being rotary, tends to work loose any accumulation and permits the same to fall, thus constituting a self-cleaning ported valve, and avoiding any accumulation of matter in the ports being forced into the whistle-pipe when the ports register; also, the ports extending inwardly, as shown, allow the steam to lubricate the face of the valve and seat on each side of the port leading to the whistle in the same manner that the recesses in the valve-seat allow the lubrication of the face of valve in con-

tact with the narrow raised places in face of seat. By this construction and organization the valve works easily, wears evenly, and prevents ridging.

The advantages of my improvements are many: There is perfect security against the apparatus becoming clogged with mud or sediment, owing to its location at the highest point in the boiler and having no pipe-connection with the water. The action being in a direct line, the least depression or elevation of the float causes the valve to be sensitive and wear evenly. The valve-seat formed with recesses admits the steam under the valve at those points, and thus relieves the pressure on the valve, so that it requires less power to move it than any other valve of the same area. It will detect “foaming” or “priming” at once, and will correctly show the rise and fall of the water in the boiler, thereby enabling the engineer to know how much water there really is in the boiler. It does not require packing at any point. The valve having to oscillate to bring the ports over the port in the seat before the whistle will sound, alarm is given only when required.

It is obvious that these improvements may be applied to steam-boilers of other classes.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, substantially as described, of the vertical tube or pipe A, the steam-chamber F, having an induction-port leading from the boiler and an eduction-port leading to the whistle, the peripheral ported valve I, arranged within the steam-chamber, and provided with connected actuating means, the indicating mechanism, the lever C, and the guiding and adjusting means, as set forth.

2. In an indicator for a steam-boiler, the combination, with a steam-chamber having induction and eduction ports and a removable cap, of the actuated valve I, ported on the periphery, and the coil-spring *w*, surrounding the arbor of the valve, said parts being arranged within the steam-chamber, as shown and described.

3. In an indicator for a steam-boiler, a tube or pipe fixed to the upper portion of the boiler and extending within the same, and formed with a side extension and a pin, in combination with a connected lever provided with a float at one end, and having pivotally-connected arms with notches, constituting, in connection with pin or side extension, an adjusting means for setting the position of the lever within the boiler, substantially as set forth.

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

NAPOLÉON BONAPARTE POTTIER.

Witnesses:

J. WESLEY WEBB,

HENRY C. MCWHORTER.