(No Model.) 2 Sheets—Sheet 1.

C. E. BROWN.

ALARM FOR STEAM BOILERS.

No. 325,193. Patented Aug. 25, 1885.

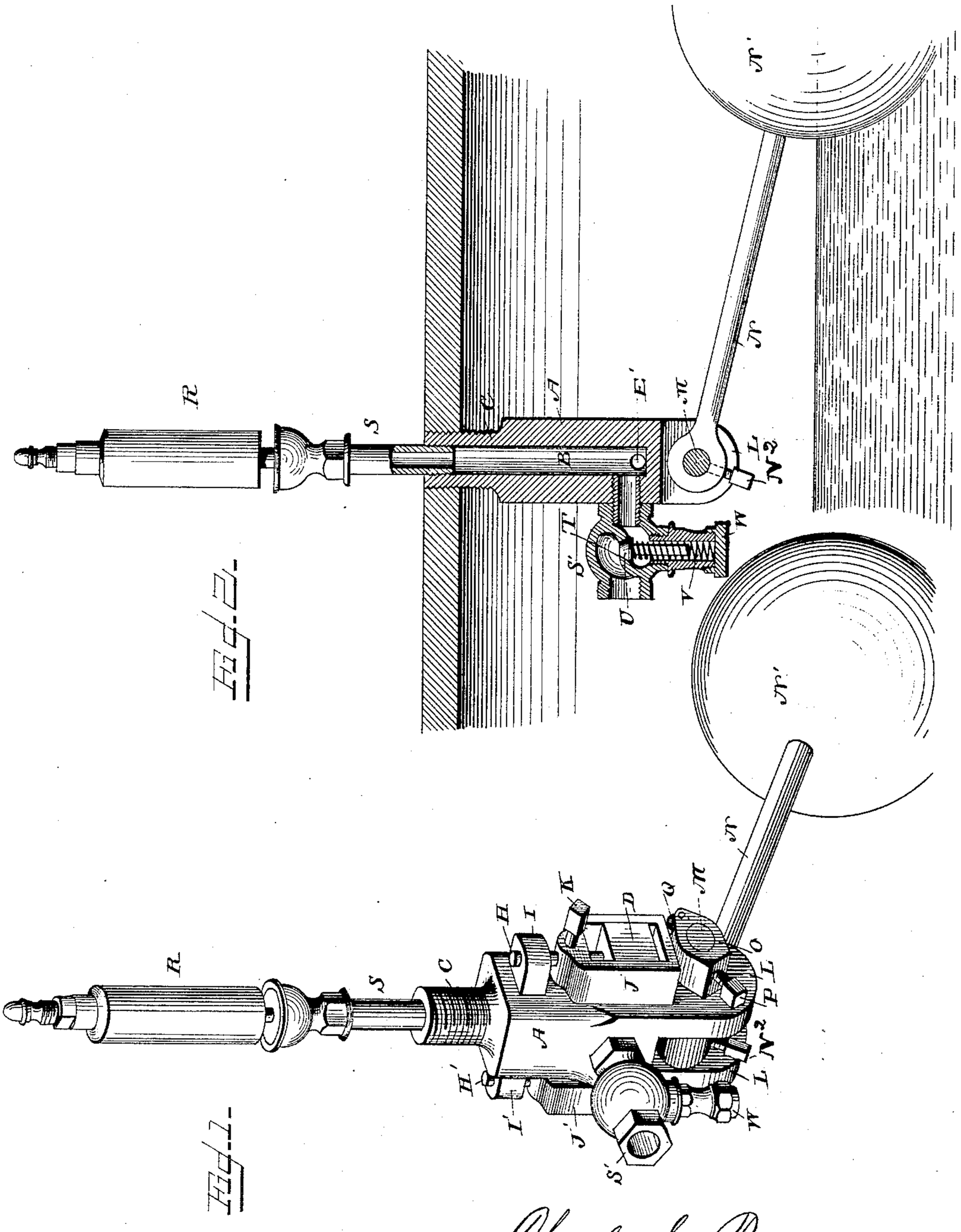

Fig. 2.

Fig. 1.

WITNESSES

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Attorneys

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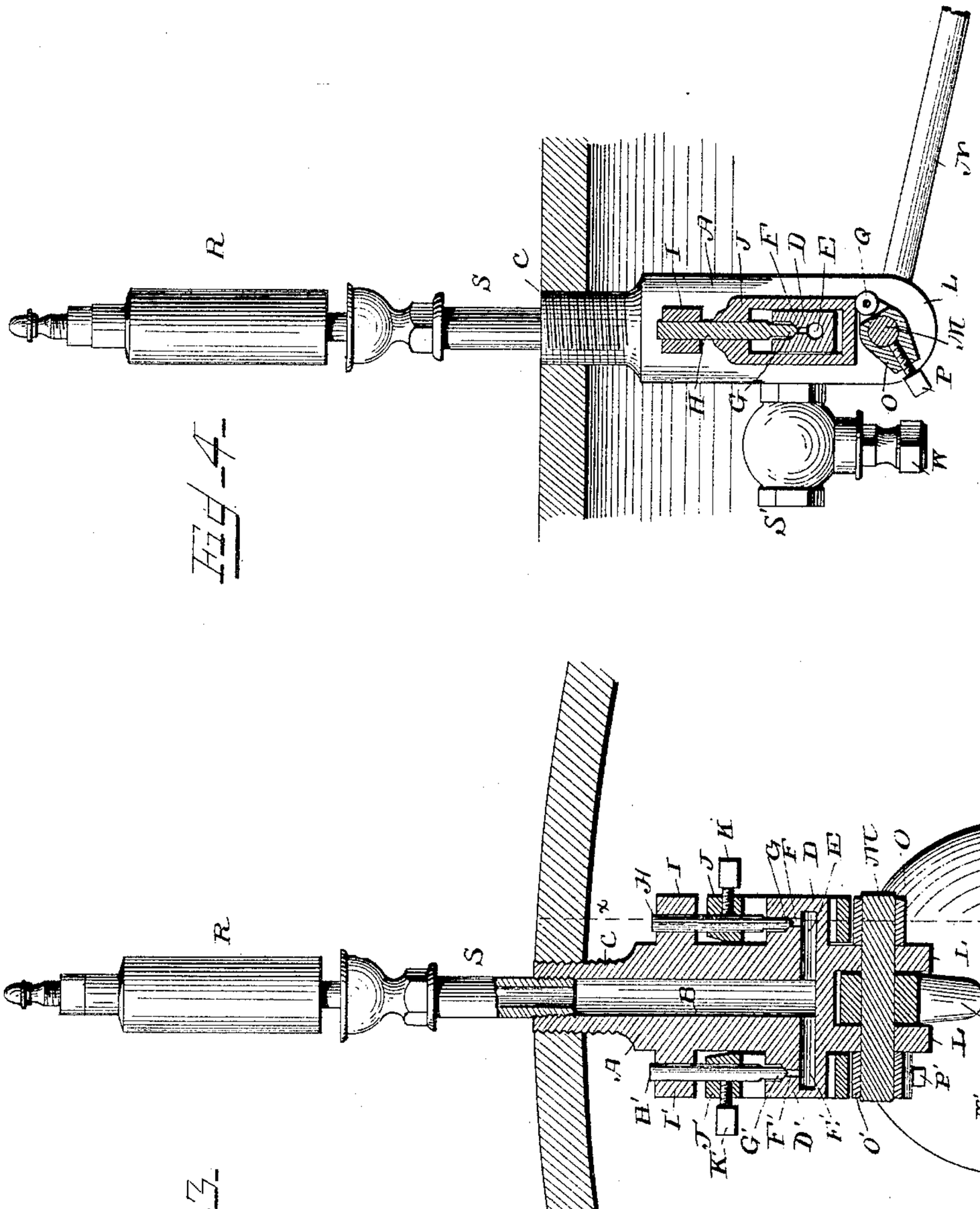

Fig. 4.

Fig. 3.

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UNITED STATES PATENT OFFICE.

CHARLES E. BROWN, OF ROME, NEW YORK, ASSIGNOR OF ONE-HALF TO SAMUEL SOUTHALL, OF SAME PLACE.

ALARM FOR STEAM-BOILERS.

SPECIFICATION forming part of Letters Patent No. 325,193, dated August 25, 1885.

Application filed June 29, 1885. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. BROWN, a citizen of the United States, and a resident of Rome, in the county of Oneida and State of New York, have invented certain new and useful improvements in high and low water and high-steam indicators and alarms for steam-boilers; and I do hereby declare that the following is a full, clear, and exact description of the invention, which 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, and in which—

Figure 1 is a perspective view of my improved high and low water and high-steam indicator and alarm, showing the same detached from the boiler. Fig. 2 is a longitudinal vertical sectional view showing the same in position in the boiler. Fig. 3 is a vertical transverse sectional view showing the device in position in the boiler, and Fig. 4 is a longitudinal vertical sectional view taken through one of the valves on the line *x x* in Fig. 3.

The same letters refer to the same parts in all the figures.

This invention relates to that class of devices which are used in connection with steam-boilers for the purpose of indicating, by an automatically-sounded alarm, when the water in the boiler either exceeds or falls below a certain limit, or when the steam exceeds the working-pressure, thereby endangering the boiler; and it has for its object to provide a device of this class which shall possess superior advantages in point of simplicity, durability, inexpensiveness, and general efficiency.

With these ends in view the invention consists in the improved construction, arrangement, and combination of parts, which will be hereinafter fully described, and particularly pointed out in the claims.

In the drawings hereto annexed, A designates the body of my improved indicator, which is provided with a central vertical recess or passage, B, closed at the lower end and terminating at the upper end in an interiorly and exteriorly threaded nipple, C, by means of which the device may be screwed into the top of the boiler, inside the latter, as will be seen in Figs. 2 and 3 of the drawings.

The body A is provided with a pair of laterally-extending lugs, D D′, having channels or passages E E′, the inner ends of which are connected with the recess B of body A, and the outer ends of which terminate in the valve-seats F F′, for the valves G G′, formed at or mounted upon the lower end of vertically-sliding stems H H′, the upper ends of which have bearings in vertical perforations in a pair of lugs, I I′, extending laterally from the body A at some distance above the lugs D D′.

J J′ are a pair of yokes, inclosing and arranged to slide vertically upon the lugs D D′, and having vertical perforations at their upper ends, through which the valve-stems H H′ extend, said yokes being secured adjustably upon the said valve-stems by means of set-screws K K′. It will be seen that the weight of these yokes will tend to hold the valves against their respective seats, while pressure against the under sides of the said yokes will lift or raise the valves from their seats.

The body A is provided with a pair of downwardly-extending lugs, L L, in which is journaled a short shaft, M, on which is mounted a lever, N, which is adjustably secured thereon by means of the set-screw N^2, and has at its free end a float, N′, adapted to float in the water contained in the boiler, which, by rising and falling, will cause the corresponding rise and fall of the lever, and corresponding movement of the shaft M. The projecting ends of the said shaft are provided with cams O O′, secured adjustably thereon by means of set-screws P P′, and having friction-rollers Q Q′, adapted to bear against the under sides of the yokes J J′, which may thus be operated so as to operate the valves carried thereby. The said cams will be so constructed and arranged that when the lever N vibrates between high and low water marks in the boiler the valve-carrying yokes shall remain at rest. The said cams will also be faced in opposite directions, so that one of the valve-carrying yokes shall be operated when the lever rises above high-water mark, while the other one shall only be operated or lifted when the lever falls below low-water mark. When either one of the valves is raised or lifted, steam will pass from the steam space of the boiler through the corresponding passage into the recess B of the

body A, and through the latter to a steam-whistle, R, of ordinary construction, which is mounted upon a pipe, S, screwed into the nipple C at the upper end of the body A. It will thus be seen that while the alarm is silent when the water in the boiler is within proper limits it will be sounded as soon as the water rises above high or falls below low water mark, and the alarm will be kept up until the state of the water in the boiler has been properly restored.

By securing the yokes D D′, cams O O′, and the inner end of the lever N adjustably in their several operative positions the distance to which the float N′ must rise or fall in the boiler before the whistle R will be sounded to indicate high or low water may be regulated at will, as will be readily understood.

The body A is provided with a forwardly-extending pipe, S′, connecting with the steam-space of the boiler, and having a seat, T, for a suitably constructed valve, U, around the stem of which is coiled a spring, V, the tension of which may be regulated by means of a screw-threaded cap, W, so as to keep the valve closed until the pressure of the steam in the boiler shall exceed a certain given limit. When this occurs, the valve will be forced open by the pressure of the steam, which will enter the recess B in the body A and pass to the whistle, which latter sounds an alarm, continuing until the pressure of steam in the boiler has been reduced to the proper limit.

From the foregoing description, taken in connection with the drawings hereto annexed, the operation and advantages of this invention will be readily understood without requiring any extended explanation.

The construction is simple and inexpensive. The entire device being arranged within the boiler, it cannot be tampered with, and being located entirely in the steam-space of the boiler it is not liable to rust or to become otherwise injured, whereby its accurate working might become impaired. It has but a single connection with the boiler-sheathing, which is, therefore, not unnecessarily weakened by the application thereto of the device. Being located within the boiler, it is protected from frost when the boiler is not in use, and having no connection with the water-space of the boiler it will never require to be blown off. It will, in short, perform its required functions thoroughly, automatically, and without attention.

Having thus described my invention, I claim and desire to secure by Letters Patent of the United States—

1. In a water and steam indicator and alarm for steam-boilers, the combination of a body having a vertical recess terminating in an interiorly and exteriorly threaded nipple at the upper end, lugs extending laterally from the said body and having passages connected at their inner ends with the said recess and terminating in valve-seats at their outer ends, the vertically-sliding valves fitted to the said seats, the vertically-sliding yokes connected adjustably with the stems of the said valves, oppositely-faced cams mounted adjustably upon a transverse rock-shaft and adapted to act alternately against the lower ends of the said yokes, a lever mounted adjustably upon the said rock-shaft and having a yoke at its free end, and a steam-whistle connected to the nipple at the upper end of the body, all arranged and operating substantially as and for the purpose herein set forth.

2. In a high and low water indicator of the class described, the combination of the vertically recessed body having laterally-extending lugs provided with passages connected at their inner ends with the recess in said body and having valve-seats at their outer ends, the valves having upwardly-extending stems, the laterally-extending lugs having bearings for the said valve-stems, the vertically-sliding yokes inclosing the lower lugs and connected adjustably with the valve-stems, and mechanism, substantially as described, for operating the said yokes, all arranged and operating substantially as and for the purpose herein set forth.

3. The herein described improved combined high and low water and high-steam indicator and alarm for steam-boilers, the same consisting of a vertically-recessed body having a pair of laterally-extending lugs provided with channels or passages connected at their inner ends with the vertical recess in the body and having valve-seats at their outer ends, the vertically-sliding valves having upwardly-extending stems, the vertically-extending bearing-lugs for the said valve stems, the yokes connected with the said valve-stems, the transverse rock-shaft at the lower end of the casing, having a float-lever and a pair of oppositely-facing cams adapted to bear against the lower ends of the said yokes, a pipe extending forwardly from the body, connecting the recess in the latter with the steam-space in the boiler and having a valve-seat, a valve opening from the steam-space into the recess in the body, a spring arranged to keep the said valve closed against the pressure of the steam, mechanism for regulating the tension of the said spring, and a steam-whistle connected to the upper end of the recess in the body, all arranged and operating substantially as and for the purpose herein shown and specified.

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

CHARLES E. BROWN.

Witnesses:

JOHN D. BAKER,

A. DELOS KNEELAND.