

1,365,786.

This technical drawing illustrates a mechanical device, possibly a pump or a valve, in a cross-sectional view. The main body is labeled 1. A piston or plunger (4) is positioned within a chamber. A spring (5) is coiled around a central shaft (7). The shaft (7) passes through a valve assembly (6, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24). The valve assembly includes a valve seat (14) and a valve (15). A fluid source (18) is connected to the device via a pipe (17) and a valve (21). The drawing is labeled with various numbers indicating different parts.

A schematic diagram of a mechanical device. On the left, a bellows (25) is connected to a rectangular box (29). A line (30) runs from the box to a horizontal pipe (26). This pipe is connected to a vertical pipe (27) that leads into a piston (28) inside a cylinder (31). The piston is shown in a cross-sectioned cylinder. A label 'Bellows' is written vertically next to the piston rod. The cylinder is labeled '31' at the bottom. The piston rod is labeled '26' and the piston head is labeled '27'. The cylinder wall is labeled '28'.

Fig. 2.

INVENTORS.
Frank A. Kimble.
William S. Fox.
BY *H. E. Demarest*
ATTORNEY.

UNITED STATES PATENT OFFICE.

FRANK A. KIMBLE AND WILLIAM S. FOX, OF ZANESVILLE, OHIO.

LOW-PRESSURE-STEAM SIGNAL.

1,365,786.

Specification of Letters Patent.

Patented Jan. 18, 1921.

Application filed December 13, 1919. Serial No. 344,516.

To all whom it may concern:

Be it known that we, FRANK A. KIMBLE and WILLIAM S. FOX, citizens of the United States of America, and residents of Zanesville, county of Muskingum, and State of Ohio, have invented certain new and useful Improvements in Low-Pressure-Steam Signals, of which the following is a specification.

10 This invention relates broadly to steam-pressure signals, and it has for its primary object to provide mechanism whereby a warning signal is given when the steam pressure of a boiler falls below a predetermined point.

15 A further object is to provide a low-pressure signal for boilers and the like which is of extremely simple and inexpensive construction and which will not readily become out of order.

20 With these and other objects in view, the invention resides in the features of construction, arrangement of parts and combinations of elements which will hereinafter be fully described, reference being had to the accompanying drawings, in which—

25 Figure 1 is a vertical sectional view of the invention, and—

30 Fig. 2 is a fragmentary section illustrating a modification.

Referring to said drawings, 1 indicates a cylinder of any appropriate dimensions which is adapted to be mounted upon a steam boiler, a threaded stem 2 being provided upon the lower end thereof and having a passage 3 through which steam is freely admitted to the lower end of the cylinder. Disposed within said cylinder is a piston 4 carried upon the lower end of a rod 5 which has its upper end portion projected outward through a removable head 6 fitted in the upper end of said cylinder.

40 A spiral spring 7 disposed in encircling relation to the rod 5 has its lower end seated upon the upper face of the piston 4 and has its upper end resting against the lower end of an adjusting sleeve 8 of externally threaded gland-like form which is adjustably mounted in the cylinder head 6, said sleeve being adapted for adjustment to regulate the tension of said spring.

45 The upper end portion of the rod 5 projects through a hole 9 provided therefor intermediate the ends of a lever 10 which is pivotally mounted at one end upon a bracket 11 carried by the cylinder head 6. The op-

posite end of said lever rests upon the upper end of a rod 12 which is vertically movable with respect to suitable located guides, as the member or members 13 formed on the exterior of the cylinder 1. Said rod 12 carries at its lower end an upwardly facing valve 14 located within a small valve chamber 15 formed on the cylinder adjacent to the lower end of the latter, and to the lower end of which steam is freely admitted through a port 16.

60 A pipe 17 leads from the upper part of said valve chamber 15 to a suitably located steam whistle 18. A web 19 formed interiorly of the valve chamber intermediate the ends thereof has a passage therethrough with a downwardly facing seat 20 for the valve 14. A packing gland 21 fitted in the upper end of said chamber has the rod 12 movable therethrough, and seated upon said gland is the lower end of a spiral compression spring 22 which has its upper end resting against an adjustable collar 23 carried by said rod 12.

70 By adjustment of the collar 23 the tension of spring 22 is regulated to maintain the valve 14 seated until a predetermined unseating force is exerted upon the rod 12 through the lever 10.

80 In practice, the tension of the spring 7 is adjusted by adjustment of the sleeve 8 so that the piston 4 is normally permitted to occupy an elevated position within the cylinder 1, being forced upward by the pressure of steam which enters said cylinder below said piston. Further, an adjusting nut 24 carried by the threaded upper end of the rod 5 above the lever 10 is adjusted so that it will seat upon said lever when the piston drops to a predetermined point permitted by lowering of the steam pressure. Obviously, further lowering of the steam pressure below said predetermined point will cause downwardly directed force to be imposed upon the vertically movable rod 12, and when this force has gradually increased to the point where the tension of spring 22 is overcome, the valve 14 becomes unseated, permitting steam to escape thereby for blowing the whistle 18.

85 In the modification illustrated in Fig. 2, an electrically operated annunciator bell 25 is substituted for the whistle. In this construction an electrical contact 26 is carried by the vertically movable rod 12^a, the same being adapted, when said rod is lowered in the manner hereinbefore described to a pre-

determined extent, to engage a stationary contact, as 27, for closing an electric circuit which includes said bell 25. As herein shown, said electric circuit comprises a
5 source of current, as a battery 28, a conductor 29, the annunciator 25, a conductor 30 leading from said annunciator to the stationary contact 27, the contact 26, the rod 12^a, the wall of the cylinder 1, and a conductor 31
10 which leads from said battery 28 and is grounded on said cylinder wall.

While we have herein shown and described simple forms of our invention it will be manifest that said invention is susceptible
15 to various minor changes in the form arrangement and dimensions of its parts. We are not, therefore, to be understood as confining ourselves to the precise details of construction and arrangement so shown and
20 described, but reserve to ourselves all such modifications and changes as fall fairly within the scope of the appended claim.

What is claimed is—

A low pressure steam signal comprising
25 a cylinder open at its lower end for the admission of steam pressure, a piston in said cylinder, adjustable tension means resisting movement of said piston under steam

impulsion, a stem carried by said piston and having an end projected outward 30 through the upper end of said cylinder, a lever pivoted upon the upper end of said cylinder and having the projecting end of said stem extending loosely there-
35 through, a vertical rod located outside and parallel to said cylinder and having the free end of said lever resting upon the upper end thereof, yieldable tension means nor-
40 mally holding said rod in elevated position, a signaling device, means for actuating said whereby said actuating means are main-
45 tained inactive when said rod is in elevated position, and means adjustable on said stem above said lever whereby the latter is drawn
50 downward with the lowering of the piston to a predetermined extent for depressing said actuating means to signal operating position through the intermediacy of said rod.

In testimony whereof we affix our signatures in presence of two witnesses.

FRANK A. KIMBLE.
WILLIAM S. FOX.

Witnesses:

J. M. NORMAN,
LOUIS H. WISE.