

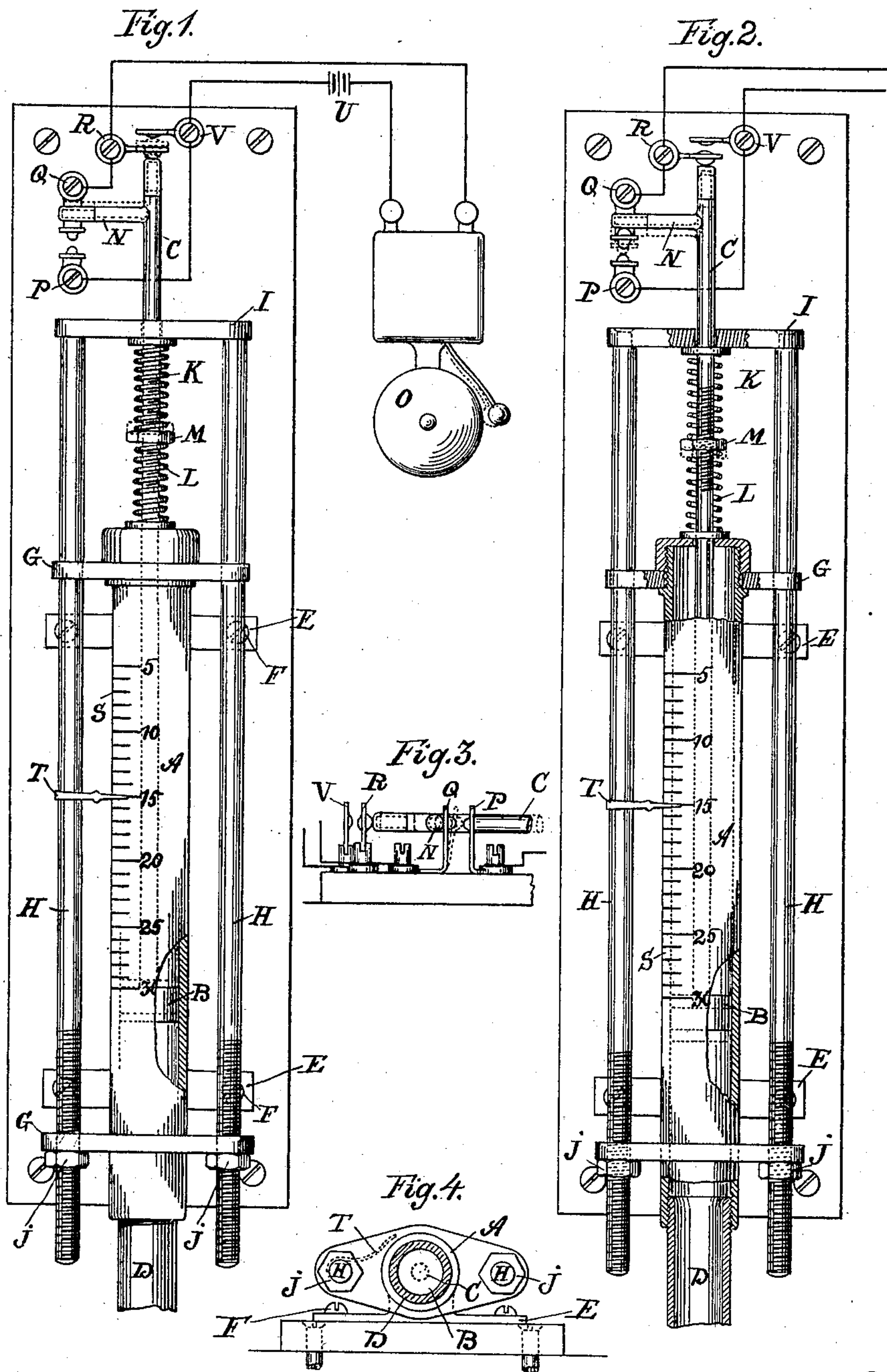
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F. H. SCHMITZ.  
HIGH OR LOW PRESSURE SIGNAL ALARM.

APPLICATION FILED SEPT. 4, 1903.

NO MODEL.



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# UNITED STATES PATENT OFFICE.

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## HIGH OR LOW PRESSURE SIGNAL-ALARM.

SPECIFICATION forming part of Letters Patent No. 755,708, dated March 29, 1904.

Application filed September 4, 1903. Serial No. 172,013. (No model.)

*To all whom it may concern:*

Be it known that I, FRANK HENRY SCHMITZ, a citizen of the United States, and a resident of the city of New York, borough of Brooklyn, county of Kings, State of New York, have invented a certain new and Improved High or Low Pressure Signal-Alarm, of which the following is a full and exact description.

The object of the invention is to provide a method of indicating when the pressure of steam is greater or lower than required.

My invention can be applied to an ammonia apparatus such as is used in cold-storage plants, breweries, and the like and can also be used on any machine where a certain pressure is required, either liquid or gas.

The device consists of a cylinder containing a piston which can be applied directly to the boiler or any pressure-pipe by means of a tube, said cylinder having a projecting piston-rod held in position by a spiral spring, so that when the pressure gets beyond the required or safety limit the pressure of the steam in the piston will push the plunger having the piston-rod against an electrical connection, closing the circuit and ringing an ordinary electrical bell. When there is vacuum and the water or pressure is too low in the boiler or other receptacle, the vacuum will draw back the rod against another wire and again close the circuit.

The invention consists of novel features and combinations of the same and will be more fully described hereinafter and then pointed out in the claims.

The invention is illustrated in the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all views.

In the accompanying drawings, Figure 1 is an elevation, partly-sectional view, showing a cylinder-containing piston in normal position, and in dotted lines is indicated the circuit-break on the forward stroke of the piston-rod. Fig. 2 shows especially the side arm in normal position, and in dotted lines the circuit is shown during a vacuum. Fig. 3 is an elevation of the contact-block as shown in Fig. 2, and Fig. 4 is an end view of Fig. 1.

In the accompanying drawings, A shows the cylinder-cover partly broken away, so as to show the plunger B, to the upper or outer end of which is attached the piston-rod C.

D shows a pipe leading into the boiler or other receptacle on which the cylinder is secured by a thread cut on the end of said pipe. The cylinder is also secured to a piece of wood or any other material by two bands E, passing around it and having holes in their ends through which pass screws F. Permanently fastened to both ends of the cylinder are blocks or arms G, having openings through which the arms H can freely pass. These rods H at their farther or outer end are rigidly connected to a cross-arm I, thus forming a rectangular adjustable sliding frame on the outside of the cylinder. Through a hole in the center of the cross-arm I passes the projecting piston-rod C. At the lower ends of the rods H are screw-nuts J, which are used for the purpose of adjusting the tension of the spiral springs K and L to the amount of pressure required, as will be more fully described hereinafter. On the projecting piston-rod C and between the head of the piston and the arm I, which is rigidly secured to the side bars H, are two helical wire springs K and L, separated by a nut M, which may be tightened or loosened, as required. The spring K is intended to give the piston-rod C a backward movement when there is a vacuum or a lower pressure in the boiler, and the spring L gives it a forward movement when there is a high pressure. The piston-rod C has an arm N, which is used to close the electrical circuit when there is a vacuum in the boiler, as hereinafter described.

At O is shown an ordinary electric bell, with the battery at U, having two poles with contact-points P Q and R and V. These contact-points and their construction is shown fully and in detail in Fig. 3 of the drawings. As shown in Fig. 3, when the piston rises or is pushed forward by an excess of steam over the required amount in the boiler the piston-rod C pushes the contacts V and R together and the circuit is closed. When there is a vacuum and the piston descends, the arm N of the rod C presses against the contact Q, and the



contacts Q and R are thus brought together and the circuit is closed. These contacts are made of light spring metal, so that when the pressure of the rod is removed from them they spring automatically back into their normal places. The contacts P and Q are of course both on the same side of the arm N, as shown by Fig. 3—that is to say, between the arm N and the adjustable frame.

On the cylinder A is cut or placed a scale or indicator S, on which may be indicated by figures the required number of pounds of pressure—for instance, five, ten, fifteen, twenty, &c.—and on one of the arms H is a pointer T.

The mode of operation of the device is as follows: Assuming the boiler is required to carry one hundred and fifteen pounds of steam and no more or no less, the indicator T is placed opposite the figure "115." The indicator can be adjusted to any figure of pressure required by turning the screw-nuts J on the rods H, which press the springs K and L to the amount of pressure required. The steam of course passes directly from the boiler into the piston A, and when there is more than one hundred and fifteen pounds it forces the rod C against the contact-point of the electrical apparatus, thus closing the circuit and ringing the bell. Should there be a vacuum or the water be too low in the boiler, the vacuum, with the aid of the spring L, will cause a back motion of the piston-rod C, and the arm N of the piston-rod C will be forced or drawn backward toward the cylinder and come in contact with the contact-point P, thus closing the circuit and ringing the bell.

One of the advantages of my invention is that the device is automatic and needs no watching, and the person in charge of the engine may be in another room or other part of the building, yet will be able to hear the alarm sound when the pressure is too high or too low. The ends of the piston-rod and side arm are provided with insulating-caps to prevent any undesirable electrical contact.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In combination, an automatic high or low pressure signal-alarm, consisting of a cylinder containing a piston carrying a rod or circuit-breaker, having an arm attached thereto and passing through a rectangular adjustable sliding frame, two spiral springs on said rod or cir-

cuit-breaker between the outer end of the adjustable sliding frame and the head of the cylinder, separated by an adjustable nut on the rod or circuit-breaker, for the purpose of holding the piston-rod or circuit-breaker in a stationary position; nuts on the ends of the arms or sides of the sliding adjustable frame for the purpose of regulating the amount of pressure required, an indicator or scale on said cylinder, on one of the arms of said frame a pointer to indicate the pressure, an electrical apparatus, as shown and described.

2. In combination, an automatic high or low pressure signal-alarm consisting of a cylinder containing a piston with a rod or circuit-breaker on said piston, a rectangular adjustable sliding frame on the outside of said cylinder, two spiral springs on said piston-rod or circuit-breaker between the end of the cylinder and the farther end of the adjustable sliding frame, an adjustable nut on said piston-rod between the two spiral springs, nuts on the arms or lower ends of the adjustable sliding frame for the purpose of adjusting the required pressure, a scale or indicator, a pointer on one of the arms of said frame, and an electrical apparatus for ringing a bell, substantially as shown and described.

3. In combination, an automatic high or low pressure signal-alarm, consisting of a pipe leading from a boiler or other receptacle to a cylinder containing a piston, a rod or circuit-breaker attached to the plunger on said piston, a rectangular adjustable sliding frame on the outside of said cylinder, two spiral springs on the piston-rod or circuit-breaker between the end of the cylinder and the farther end of the adjustable sliding frame, an adjustable nut on said piston-rod between the two spiral springs, nuts on the arms or lower ends of the adjustable sliding frame, for the purpose of adjusting the device to the required pressure, a scale or indicator, a pointer on one of the arms of said frame, an electrical apparatus for ringing a bell, substantially as shown and described.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 3d day of September, 1903.

FRANK H. SCHMITZ.

Witnesses:

WM. E. WARLAND,  
CHAS. A. WILLIAMS.