(No Model.)

A. RANSOM & A. J. CORROTHERS.

ELECTRIC ALARM FOR STEAM GAGES.

No. 568,370. Patented Sept. 29, 1896.

Fig. 1.

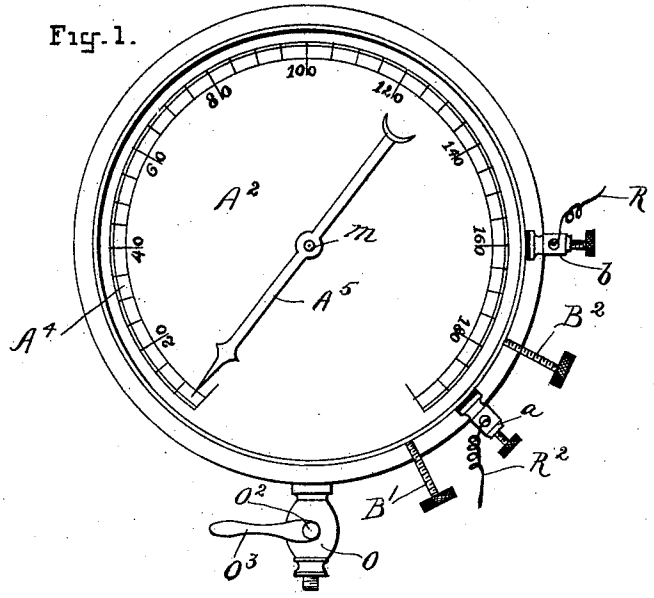
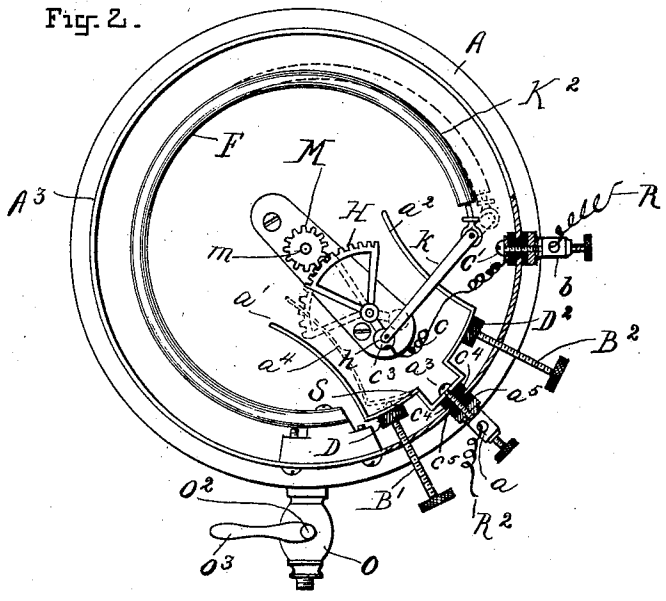


Fig. 2.



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UNITED STATES PATENT OFFICE.

ALBERT RANSOM AND ANDREW JACKSON CORROTHERS, OF WISE, WEST VIRGINIA.

ELECTRIC ALARM FOR STEAM-GAGES.

SPECIFICATION forming part of Letters Patent No. 568,370, dated September 29, 1896.

Application filed January 25, 1896. Serial No. 576,823. (No model.)

To all whom it may concern:

Be it known that we, ALBERT RANSOM and ANDREW JACKSON CORROTHERS, citizens of the United States, and residents of Wise, in the county of Monongalia and State of West Virginia, have invented certain new and useful Improvements in Electric Alarms for Steam-Gages, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof, in which similar letters of reference indicate corresponding parts.

This invention relates to automatic electrical alarms for steam-gages, and the object thereof is to provide a device of this class which is simple in construction and operation and which may be connected with any form or class of boiler and which is adapted for use wherever such devices are required.

The invention is fully disclosed in the following specification, of which the accompanying drawings form a part, in which—

Figure 1 is a plan view of our improved electrical alarm steam-gage, and Fig. 2 a similar view with the upper casing removed.

In the practice of our invention we provide a steam-gage of the usual form or any desired form, which consists of a bottom casing A, a top casing A^2, and an annular band A^3, by means of which the top and bottom casings are connected, and the top casing A^2 is provided with a circular scale A^4, which is graduated in the usual manner and over which moves or in connection with which operates a pointer or indicator A^5. We also employ brass binding-posts *a* and *b*, which are secured to the shell or casing of the gage or to the annular band A^3 thereof by the screws a^3 and C′, and *a′* and a^2 represent the two ends of a continuous brass spring S, which is preferably about one-quarter of an inch in width and one sixty-fourth of an inch in thickness and very highly tempered and secured to the gage or to the band A^3 thereof by the screw a^3. This connection is perfectly insulated from the casing of the gage by insulating-washers C^4 and a^5 and also the insulation C^5 around the screw a^3, where said screw passes through the shell or band A^3 of the gage-casing. The spring ends *a′* and a^2 are adjusted by means of the screws B′ and B^2, which pass through the band A^3 of the casing, as shown in Fig. 2, and one side of said spring may be adjusted into the position shown in dotted lines at a^4, and D′ and D^2 represent insulation-blocks on the point of the adjusting-screws B′ and B^2, and this connection being thus insulated from the gage we have two termini in the one connection, one at *a′* and the other at a^2. We also employ a small coil C, of No. 36 silk-covered copper wire, which is soldered to the head *h* of a segmental gear H, as shown at C^3, and which is also secured to the binding-post *b* by the screw C′. The terminus of this connection being in the head *h* of the gear H to complete the circuit the gear H must make contact with either the end *a′* or the end a^2 of the spring S, *a′* being the higher-pressure alarm and a^2 the low-pressure alarm.

The tendency of the tubular spring F, when subjected to pressure, is to move in the direction of the dotted line K^2, thus changing the position of the gear H, as shown in dotted lines, and it will thus be seen that so long as the pressure increases the gear H continues to move toward the end *a′* of the spring S, which is the high-pressure alarm, the alarm being given when contact is made with the end *a′* of the spring S by the gear H, thus closing the circuit. The low-pressure alarm is regulated in like manner, and by means of the adjusting-screws B′ and B^2 any desired amount of variations between the alarms may be provided for, or either one may be used entirely independent of the other.

Any kind of electric bell may be used and may be placed in any desired part of a building; and it will also be apparent that any kind of open-circuit battery may be employed.

The entire device is simple and easily understood, and the construction thereof is not likely to get out of order, and the same is also easily repaired, if repair should become necessary.

It will also be apparent that this improve-

ment may be fitted to old gages as well as new, and the adjustment thereof is positive, the adjusting being done while the pressure is at the point at which it is desired to sound the alarm.

The use of a small switch at some convenient point in the circuit is desirable, in order to cut out the alarm in case it may be desired to lower the pressure or when the pressure remains for a considerable time at the point of alarm from any cause whatever.

It will be observed that the gear II is provided with gear-teeth which operate in connection with a pinion M, which is mounted on a shaft *m*, and this shaft *m* projects through the upper casing A^2, and the pointer or indicator A^5 is mounted thereon, and the gage is connected with the boiler by means of a coupling-head O, which is provided with a valve O^2 and a lever O^3, by which it is operated, and the effect of the steam within the gage and the operation thereof upon the spring F, which is connected with the head *h* of the sector II by the arm K, will be readily understood by those familiar with this class of devices.

A wire or conductor R connects with the binding-post *b* and with the electric bell hereinbefore described but not shown, and a similar wire or conductor R^2 connects with the binding-post *a* and the battery hereinbefore referred to, and our invention is not limited to the exact form, construction, and arrangement of the various parts thereof, and we reserve the right to make all such alterations in and modifications of the construction, combination, and arrangement of parts herein described as fairly come within the scope of the invention.

Having fully described our invention, we claim as new and desire to secure by Letters Patent—

1. The combination in a steam-gage, of a high and low pressure electrical alarm, which consists of a segmental gear which operates in connection with a pinion which is mounted on the shaft of the pointer or indicator, a curved steam-operated spring connected with the head of said gear, a metal spring which is secured to the casing of the gage and provided with two ends, each of which projects inwardly, and one adjacent to each side of said gear, an electrical conductor which connects the head of said gear with the binding-post which is provided with a conductor which leads to an alarm-bell, and said metal spring being also secured to said casing by means of another binding-post which is provided with a conductor which connects with a battery or other electrical supply, and high or low pressure adjusting devices which operate in connection with said metal spring, substantially as shown and described.

2. The combination in a steam-gage, of a high and low pressure electrical alarm, which consists of a segmental gear which operates in connection with a pinion which is mounted on the shaft of the pointer or indicator, a curved steam-operated spring connected with the head of said gear, a metal spring which is secured to the casing of the gage and provided with two ends, each of which projects inwardly, and one adjacent to each side of said gear an electrical conductor which connects the head of said gear with a binding-post which is provided with a conductor which leads to an alarm-bell, and said metal spring being also secured to said casing by means of another binding-post which is provided with a conductor which connects with a battery or other electrical supply, and high or low pressure adjusting devices which operate in connection with said metal spring, said binding-posts and said metal spring being suitably insulated and said high and low pressure adjusting devices consisting of screw-threaded bolts which pass through the casing, and are adapted to operate the opposite ends of said metal spring, substantially as shown and described.

3. The combination in a steam-gage, of a high and low pressure electrical alarm, which consists of a segmental gear which operates in connection with a pinion which is mounted on the shaft of the pointer or indicator, a curved steam-operated spring connected with the head of said gear, a metal spring which is secured to the casing of the gage and provided with two ends, each of which projects inwardly, and one adjacent to each side of said gear, an electrical conductor which connects the head of said gear with a binding-post which is provided with a conductor which leads to an alarm-bell and said metal spring being also secured to said casing by means of another binding-post which is provided with a conductor which connects with a battery or other electrical supply, and high or low pressure adjusting devices which operate in connection with said metal spring, said binding-posts and said metal spring being suitably insulated and said high and low pressure adjusting devices consisting of screw-threaded bolts which pass through the casing, and are adapted to operate the opposite ends of said metal springs, and the inner ends thereof being provided with insulating blocks or heads, and said parts being constructed, combined and arranged, substantially as shown and described.

4. The combination with a steam-gage provided with a pointer or indicator, of a segmental gear adapted to operate in connection with a pinion mounted on the pointer or indicator shaft, a metal spring which is connected with the casing of the gage and provided with two separate ends which project on opposite sides of said segmental gear, said metal spring being in electrical connection

with a battery and said segmental gear being in electrical connection with an alarm-bell, and said gage being also provided with a steam-operated spring which is in connection with said gear, substantially as shown and described.

In testimony that we claim the foregoing as our invention we have signed our names, in presence of the subscribing witnesses, this 18th day of January, 1896.

ALBERT RANSOM.
A. J. CORROTHERS.

Witnesses:
I. H. ROBINSON,
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