(No Model.)

M. BECKERS.

ELECTRIC BOILER ALARM.

No. 461,178. Patented Oct. 13, 1891.

Fig.1

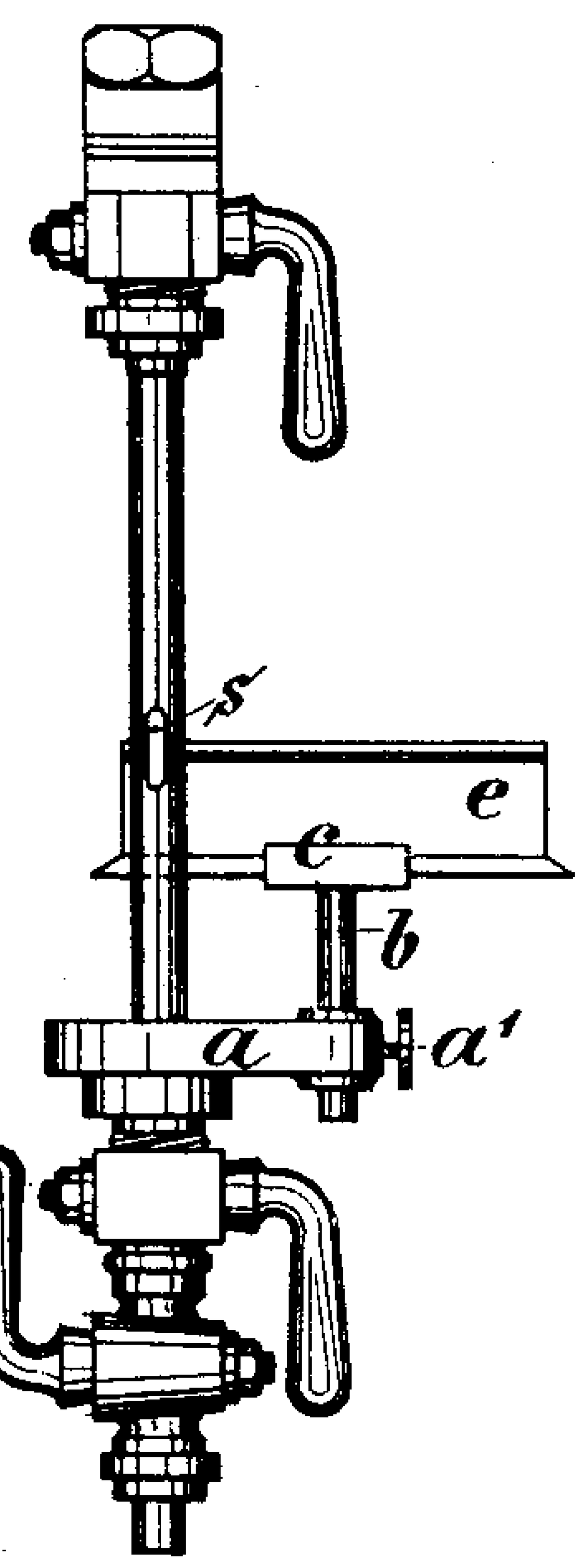


Fig.2

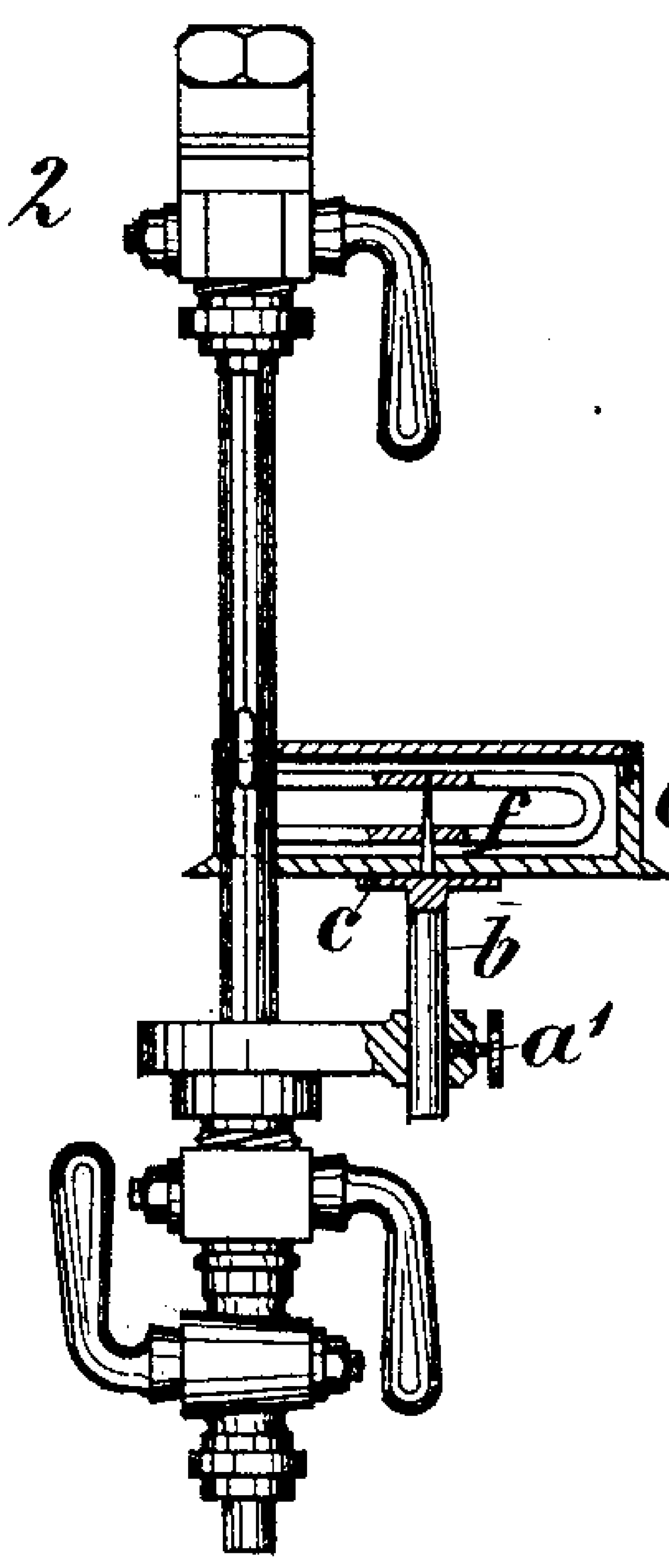


Fig.4

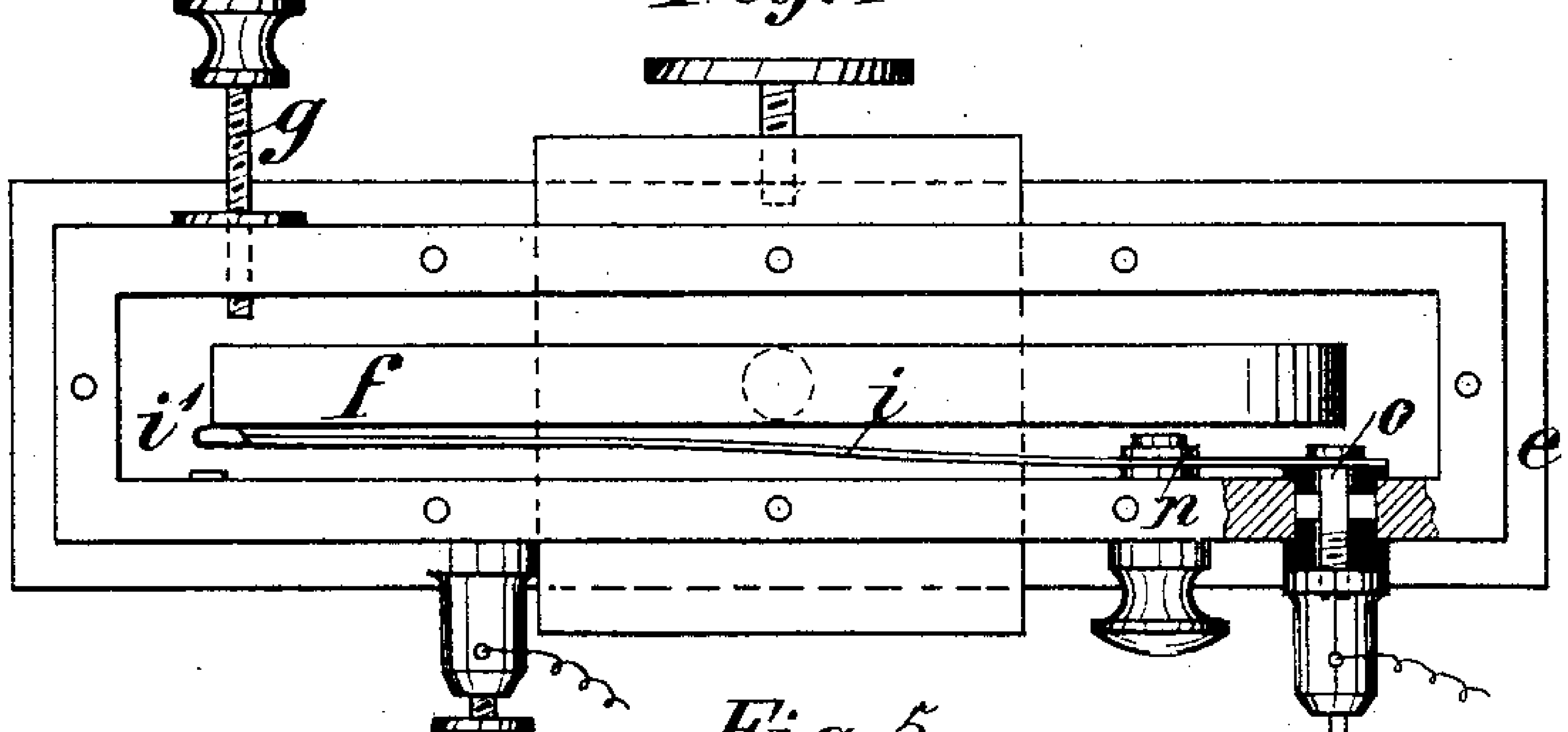


Fig.3

Fig.5

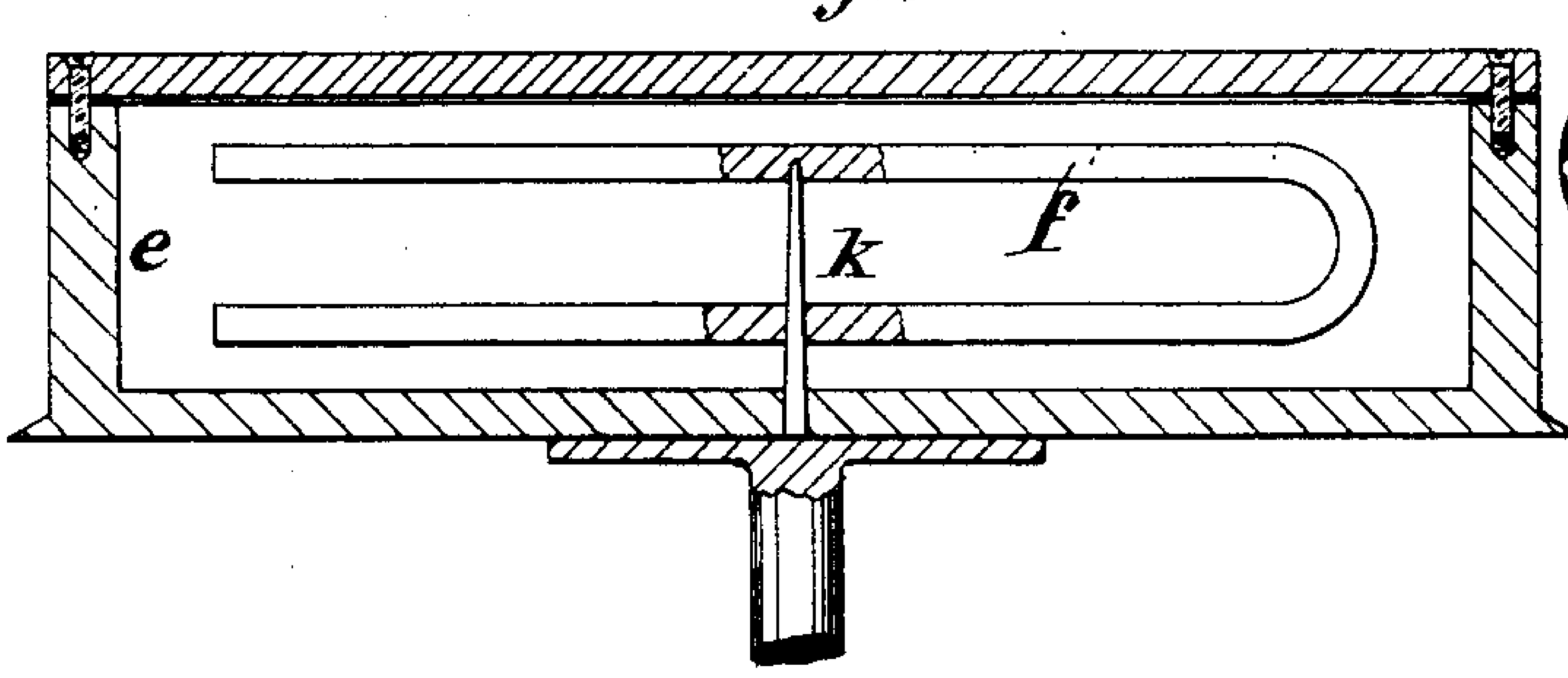
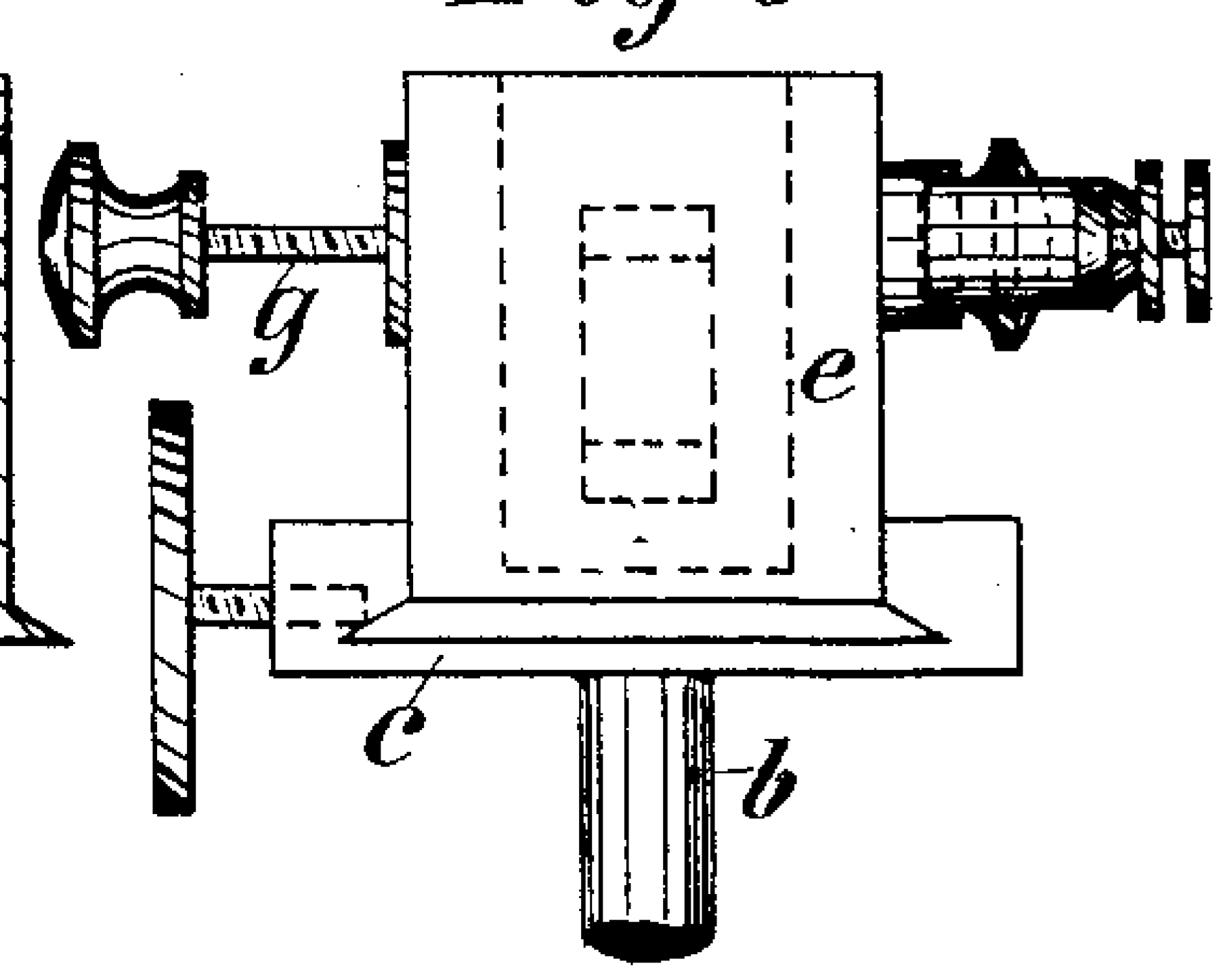


Fig.6



Witnesses:
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UNITED STATES PATENT OFFICE.

MATHIAS BECKERS, OF LANGERWEHE, GERMANY.

ELECTRIC BOILER-ALARM.

SPECIFICATION forming part of Letters Patent No. 461,178, dated October 13, 1891.

Application filed December 24, 1889. Serial No. 334,887. (No model.)

To all whom it may concern:

Be it known that I, MATHIAS BECKERS, a subject of the German Emperor, residing at Langerwehe, in Germany, have invented certain new and useful Improvements in Control Apparatus, of which the following is a specification.

This invention is especially adapted as a boiler-alarm in which an oscillating horseshoe-magnet is actuated by a magnetic float, whereby an alarm can be given when the liquid is either too low or too high.

In the accompanying drawings, Figure 1 is a side view of a water-gage with the entire apparatus. Fig. 2 is a view of the water-gage with the apparatus in section. Fig. 3 is a top view of the apparatus after the cover of the box is taken away. Fig. 4 is a top view, Fig. 5 a section, and Fig. 6 a side view, of the apparatus, which is closed in a metal box in a large scale.

This device chiefly comprises a clamp *a*, which is fixed by means of the set-screw *a'* upon the packing-nut of *h*, the lower tap of the water-gage. The outer end of the clamp is provided with a guide *c*, resting upon a vertical rod *b* and capable of being fixed in any suitable position by the set-screw *d*. Upon this guide rests a metal box *e*, which is movable to and fro and contains a horseshoe-magnet *f*, capable of oscillating upon a pin *k*. The connection of the box with the water-gage is such that the mark indicating the lowest level of the water should be at the same height as the center of the two branches of the magnet. The horeshoe-magnet is so placed that its branches are situated one above the other. On one side of the box near the magnet is arranged at *n* a weak insulated spring *i*, which is insulated at *n* and placed in communication with a source of electricity by the binding-screw *o*, Fig. 3, with the front end *i'* bent over. In the water-gage is placed a metal box *s*, floating upon the top of the water contained therein and inclosing a permanent magnet. The latter is so arranged in the float *s* that when the upper branch, for instance, of the horseshoe-magnet forms the north the lower pole of the magnet contained in the float is likewise a north pole, while its upper pole, on the contrary, forms the south pole. The result thereof is that when the float sinks the two north poles come first opposite to one another, and hence the branches of the horseshoe-magnet are repelled. The water continuing to sink to its lowest level, the south pole of the magnet inclosed in the float *s* now comes opposite the north pole of the horseshoe-magnet at the same time that the north pole of the former moves opposite the south pole of the latter, thus causing a powerful attraction of the branches of the horseshoe-magnet, in consequence whereof the said horseshoe-magnet is caused to oscillate upon the pin or pivot *k*, its upper end pressing the bent-over end *i'* of the spring *i* against the side of the box, whereby as the said box is in electric communication with the battery a double contact is formed, firstly through the spring *i* and secondly through the box, the result being the production of a strong signal.

I declare that what I claim is—

In water-level indicators for steam-boilers, a clamp *a*, with rod *b* and guide *c*, in which moves the box *e*, fixed in any suitable position by the set-screw *d* and containing the horizontally-oscillating horseshoe-magnet *f*, circuit terminals actuated by the oscillating horseshoe-magnet, and a magnetic float for actuating the said magnet.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

MATHIAS BECKERS.

Witnesses:
GUSTAVE ALBERT OELRICHS,
OTTO VON AUW.