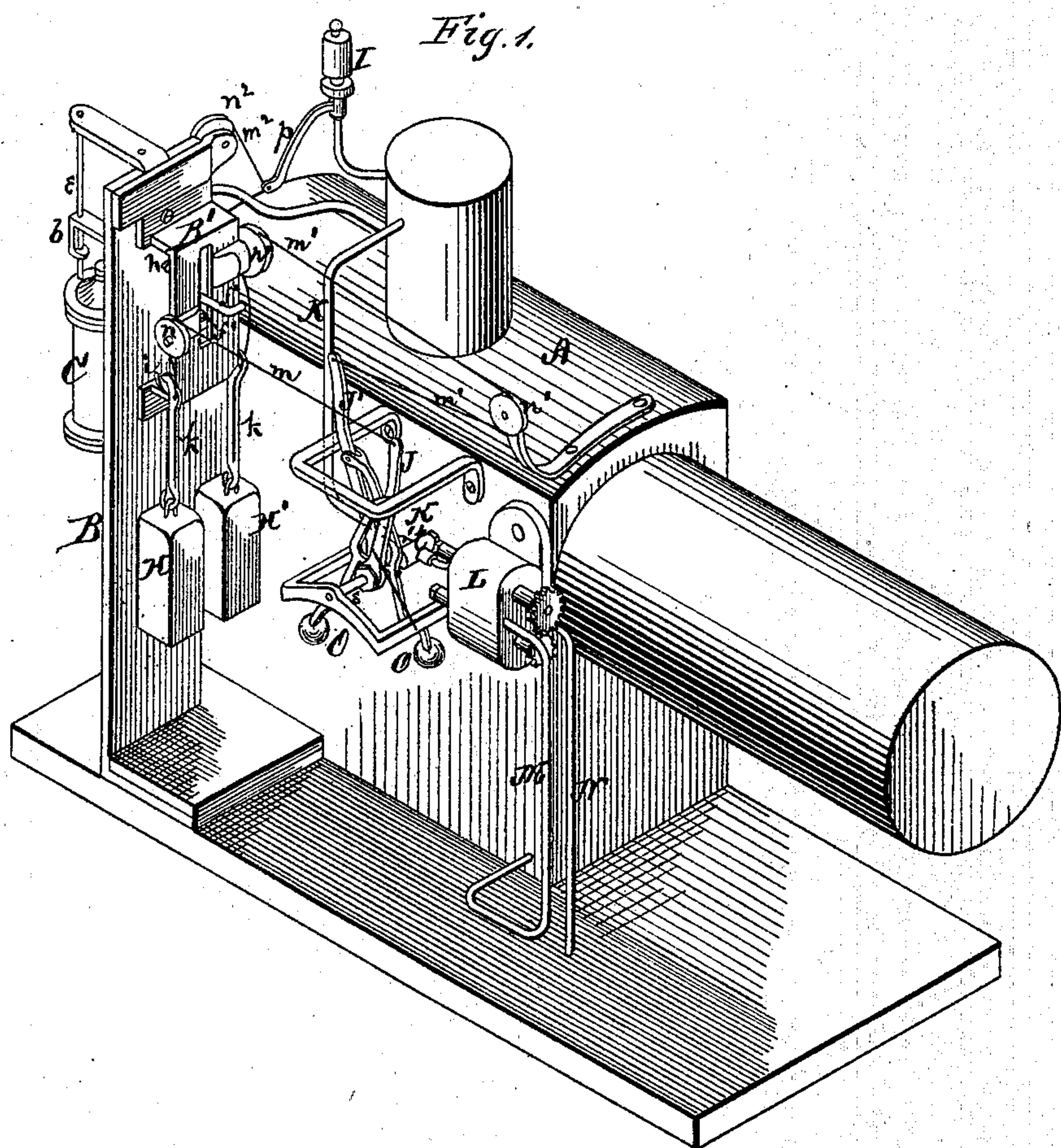


R. SAFLEY.

Water-Regulators and Alarms for Boilers.

No. 139,194.

Patented May 20, 1873.



Witness:

Frank L. Curand
L. L. Curand

Inventor.

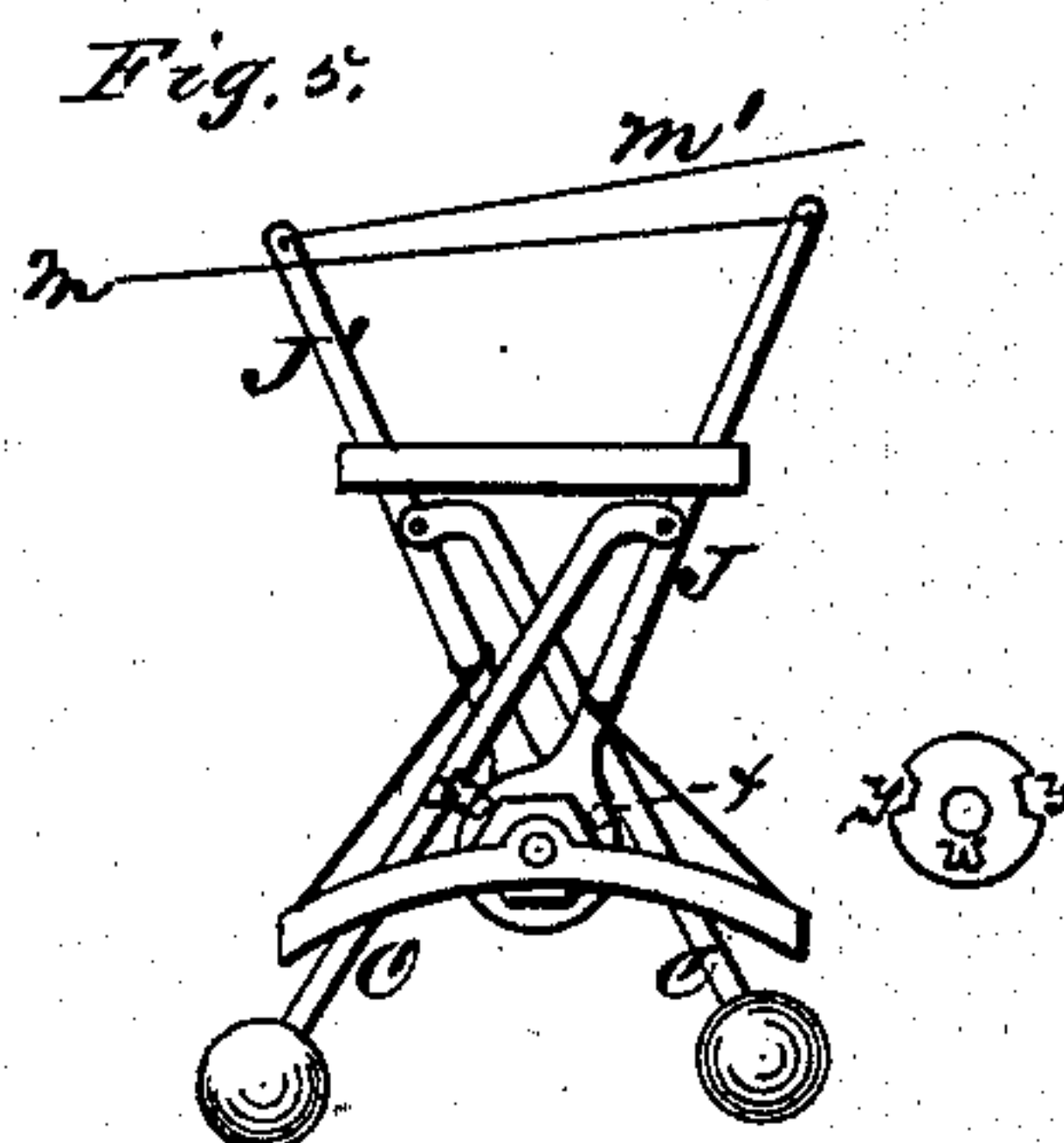
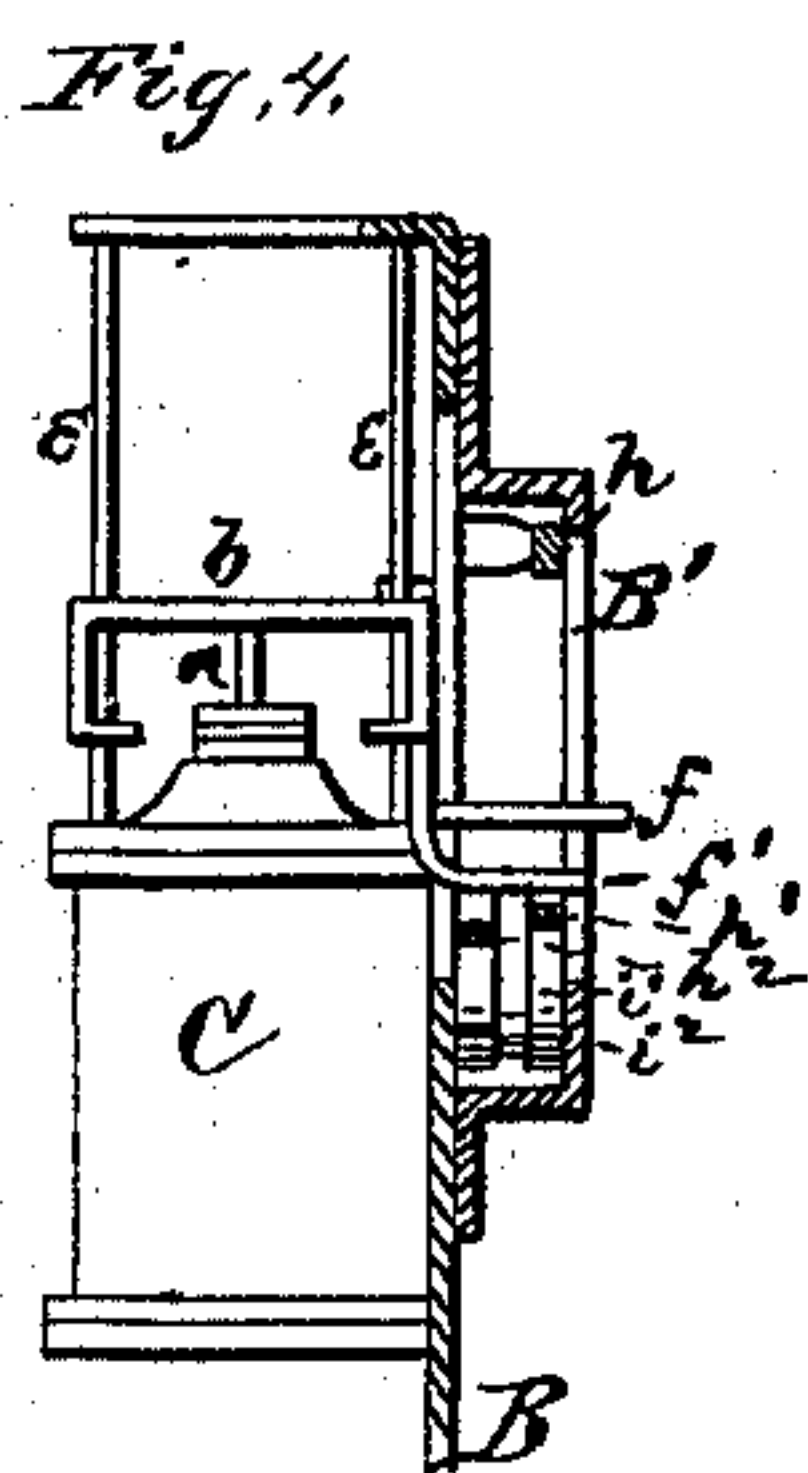
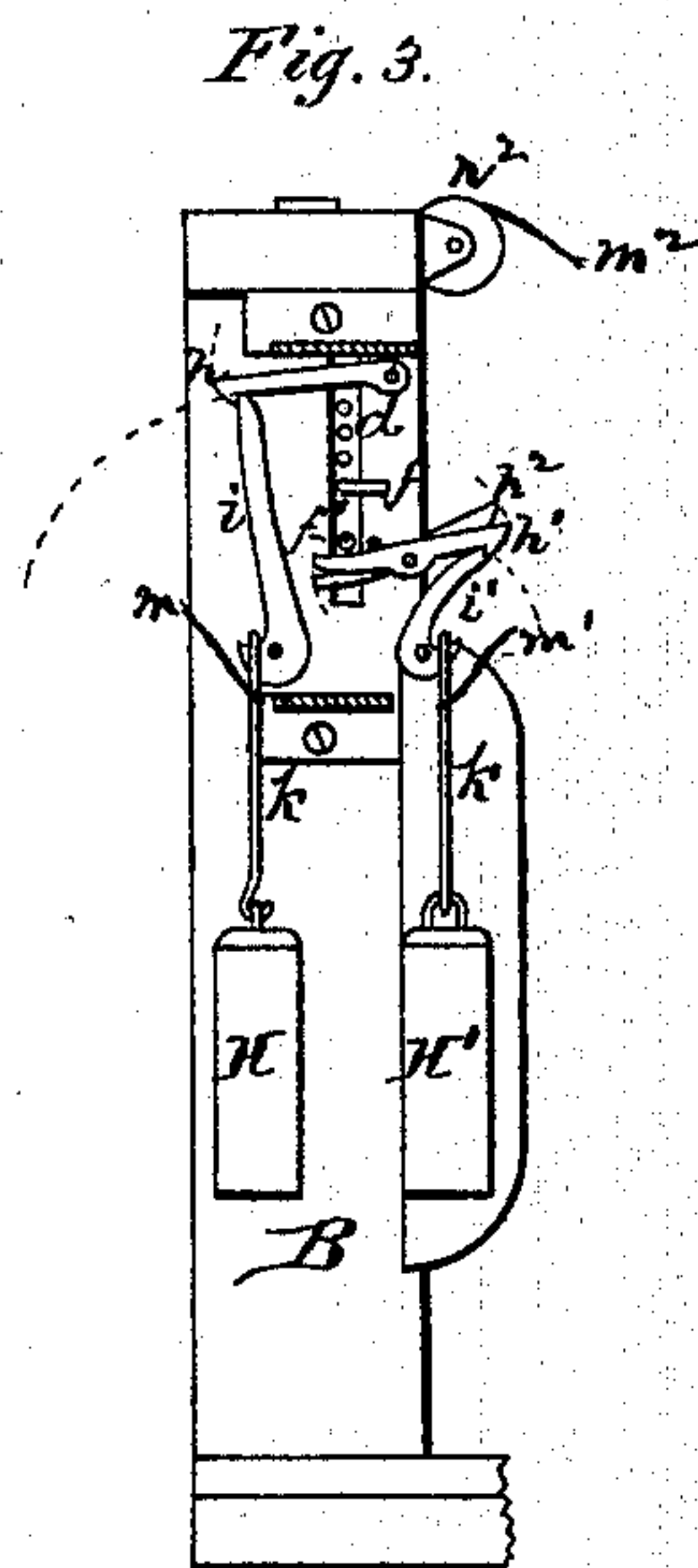
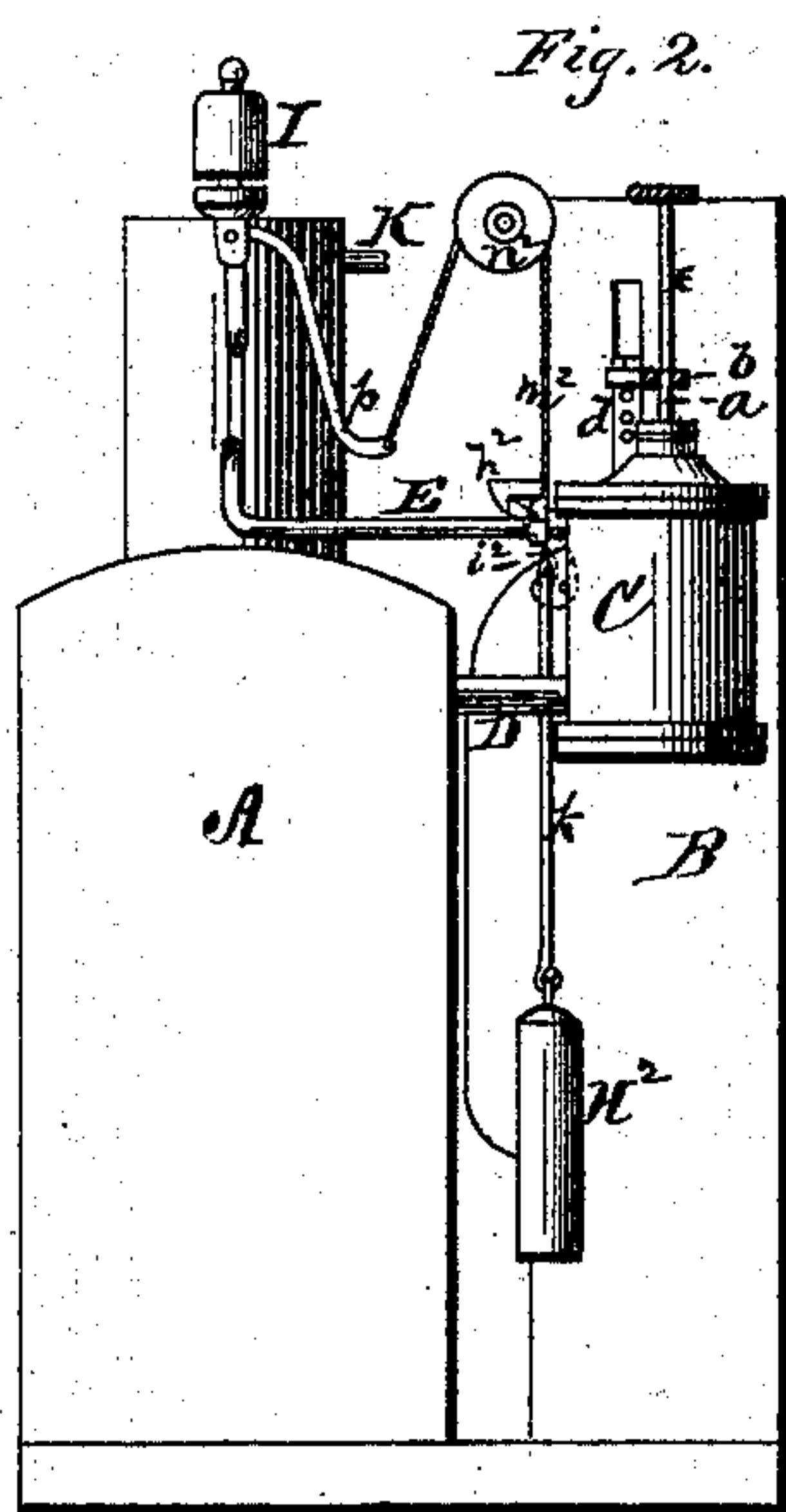
Robert Safley
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Charles Mason
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UNITED STATES PATENT OFFICE.

ROBERT SAFLEY, SENECA FALLS, NEW YORK.

IMPROVEMENT IN WATER-REGULATORS AND ALARMS FOR BOILERS.

Specification forming part of Letters Patent No. **139,194**, dated May 20, 1873; application filed March 12, 1873.

To all whom it may concern:

Be it known that I, ROBERT SAFLEY, of Seneca Falls, in the county of Seneca and in the State of New York, have invented certain new and useful Improvements in Water-Regulators and Alarms for Steam-Boilers; and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawing and to the letters of reference marked thereon making a part of this specification.

The nature of my invention consists in the construction and arrangement of a self-acting water-regulator and alarm for steam-boilers, as will be hereinafter more fully set forth.

In order to enable others skilled in the art to which my invention appertains to make and use the same, I will now proceed to describe its construction and operation, referring to the annexed drawing, in which—

Figure 1 is a perspective view of a steam-boiler, with my invention attached thereto. Fig. 2 is an end view of the same, and Figs. 3, 4, and 5 are detached views, showing certain parts of my invention.

A represents a steam-boiler of any suitable construction. On one side of the boiler A is a standard, B, to which is attached a cylinder, C, connected by pipes D and E with the boiler A. The pipe D, leading into the bottom of the cylinder, lets water from the boiler into the cylinder, and the upper pipe E, connecting the top of the cylinder with the steam space of the boiler, lets in steam, to equalize the pressure. Through a stuffing-box in the top of the cylinder C passes a rod, *a*, which is provided at its lower end, within the cylinder, with a float, which rises and falls with the water in the cylinder, and the water in the cylinder rises and falls with the water in the boiler, always keeping on a level with the same. On the upper end of the float-rod *a* is attached a cross-head, *b*, which slides upon guide-rods *e e* attached to the cylinder, and said cross-head is provided with a vertical bar, *d*, from which two pins, *f* and *f'*, project through a vertical slot in the standard B and through a plate, B', attached to the rear side of said standard. The plate B' is attached to the standard B in such a manner as to form a

space between them, and in said space, at or near the lower end, are provided two hooks, *h*¹ and *h*², and at or near the upper end is pivoted a similar hook, *h*. The hooks *h*, *h*¹, and *h*², respectively, catch on and hold cams *i*, *i*¹, and *i*², which, when thus held by the hooks, are intended to support weights H, H¹, and H², respectively, said weights being provided with hooked rods *k* to hook on to the cams. From the rod to the weight H² a cord, *m*², passes over a pulley, *n*², and connects with an arm or lever, *p*, on the alarm-whistle I, to operate the same, as shown in Fig. 2. From the rod of the weight H¹ a cord, *m*¹, passes over pulleys *n*¹ *n*¹, and connects with a lever, J', for opening the stop-cock in the steam-pipe K leading from the boiler to the pump L. From the rod of the weight H a cord, *m*, passes over a pulley, *n*, and connects with a lever, J, for closing the stop-cock in the steam-pipe K. The pump L is constructed in any of the known and usual ways, and connected by a pipe, M, with the boiler at or near its bottom, and by a pipe, N, with the water-tank or well. The levers J and J' are placed loosely on the stem *s* of the stop-cock *t* in the steam-pipe K, and to each lever is pivoted or hinged a weighted arm, O, provided on its inner side with a tooth or projection, *x*, to fit in corresponding notches or recesses *y*, made on a disk or wheel, *w*, attached on the stop-cock stem *s*.

All the weights H, H¹, and H² being suspended, as above described, on their respective cams *i*, *i*¹, and *i*², and these held by the hooks *h*, *h*¹, and *h*², then, when the water in the boiler and cylinder falls, the float in the cylinder falls with it until the pin *f'* strikes the hook *h'*. This releases the cam *i*¹, allowing the weight H¹ to fall down, and thereby pull the lever J'. The swinging arm O on this lever, resting, with its tooth *x*, in one of the notches *y* on the wheel *w*, causes, when the lever J is pulled by the weight, as just mentioned, the wheel *w* to turn and open the stop-cock *t*. This lets steam into the pump L, starting the same, so as to pump water into the boiler. Should, by any derangement of any part, the boiler not work, the water in the boiler and cylinder will fall still more, and the pin *f'* strike the hook *h*², causing the

weight H^2 to fall and sound the alarm. When the pump is in operation the water in the boiler and cylinder will continue to rise, carrying the float in the cylinder with it, until the water has attained the height desired, when the pin f strikes the hook h , releasing the cam i , and causing the weight H to fall, thereby pulling the lever J , which, by the tooth on its arm O , turns the stop-cock t , closing the same and shutting off the steam from the pump L .

The pin f may be changed in holes on the bar d , so as to cause the weight H^2 to drop at whatever height it is desired that the water shall be in the boiler.

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

1. The cylinder C having a float inclosed, which is connected by the rod a with the cross-head b moving on the guides $e e$, said cylinder being removed from and connected with the boiler by the pipes $D E$, substantially as and for the purposes herein set forth.

2. Cross-head b attached to the float-rod a and provided with the bar d , having adjustable pin f , in combination with the hook h , cam i , weight H , cord m , and lever J , for

closing the stop-cock in the steam-pipe connected with the pump, substantially as herein set forth.

3. The cross-head b attached to the float-rod a , and provided with the bar d having pin f' , in combination with hook h^1 , cam i^1 , weight H^1 , cord m^1 , and lever J' , for opening the stop-cock in the steam-pipe connected with the pump, substantially as herein set forth.

4. The cross-head b attached to the float-rod a , and provided with the bar d having pin f' , in combination with the hook h^2 , cam i^2 , weight H^2 , cord m^2 , and whistle-lever p , for sounding the alarm, substantially as herein set forth.

6. The combination of the valve-stem s , wheel w , with notches $y y$, levers $J J'$, and weighted arms $O O$, with projections $f f$, substantially as and for the purposes herein set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 3d day of February, 1873.

ROBERT SAFLEY.

Witnesses:

A. R. PALMER,
CHAS. T. HALL.