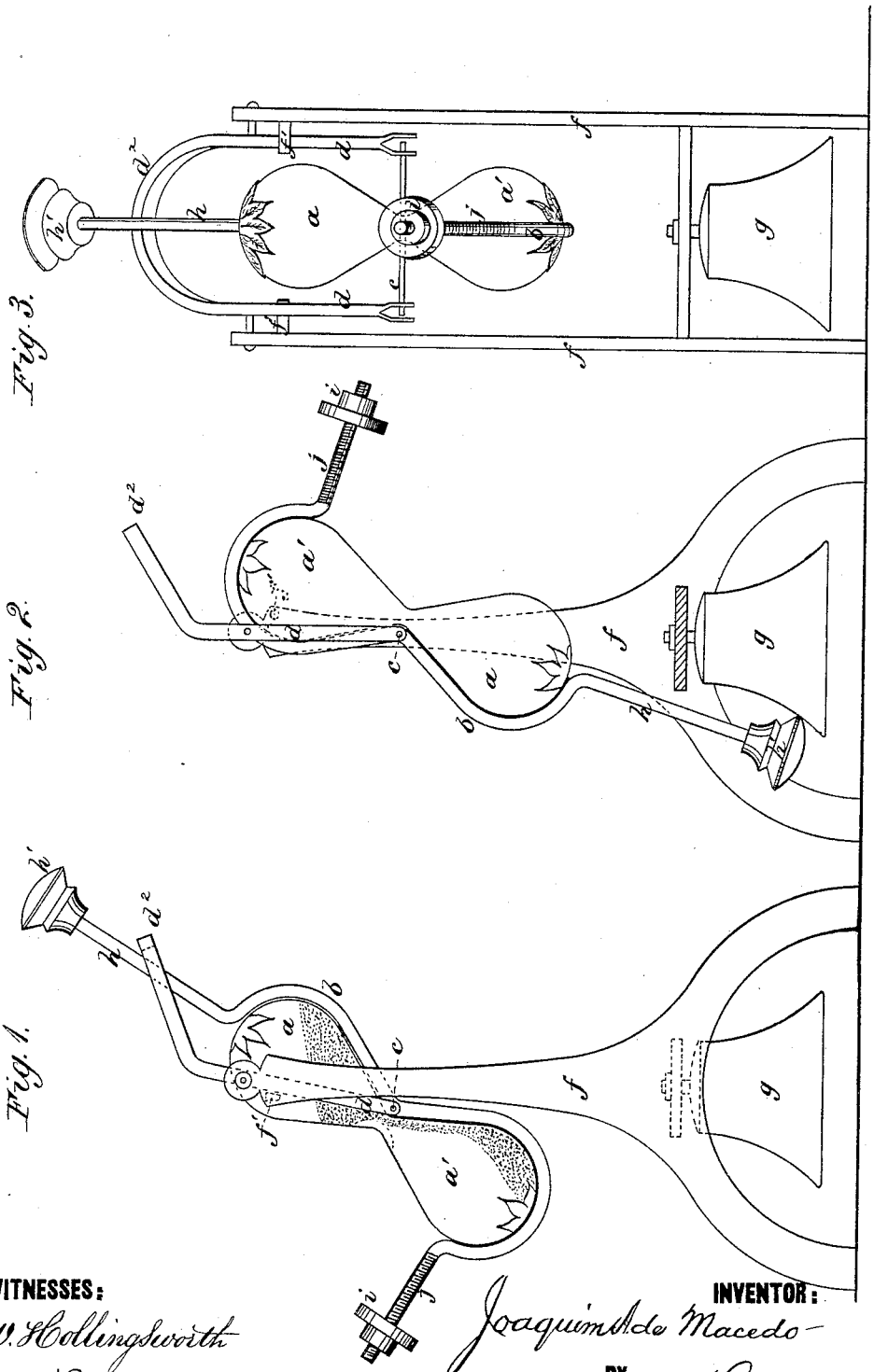
J. A. De MACEDO.
Time-Signals.

No. 199,419. Patented Jan. 22, 1878.



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JOAQUIM ANTONIO DE MACEDO, OF LEEDS, ENGLAND.

IMPROVEMENT IN TIME-SIGNALS.

Specification forming part of Letters Patent No. **199,419**, dated January 22, 1878; application filed January 2, 1878; patented in England, December 14, 1876, for fourteen years.

To all whom it may concern:

Be it known that I, JOAQUIM A. DE MACEDO, of Leeds, in the county of York, England, have invented a new and useful Improvement in Egg-Boilers; and I do hereby declare that the following is a full, clear, and exact description of the same.

The object of my invention is to provide an ordinary sand-glass or egg-boiler with a means of automatically giving an audible signal, so that the glass need not be constantly watched in order to know when the sand has run out, and thereby avoid the risk of overboiling.

My invention consists in mounting or suspending the sand-glass in such manner that when all or a certain proportion of the sand has run out one end of the sand-glass will overbalance the other, and cause a bell, or its equivalent, to be sounded to thus notify the attendant.

My invention also consists in providing the sand-glass with an adjustable device so arranged that the glass will be inverted and give the signal after the lapse of a longer or shorter period of time, as may be required.

In the accompanying drawings, Figures 1 and 2 are side elevations of my improved egg-boiler in two different positions, and Fig. 3 is a front elevation.

a a' is an ordinary sand-glass fixed in a wire frame, *b*, provided with a horizontal bar or axis, *c*, which passes just behind the middle or neck of the sand-glass, and is mounted in bearings in the extremities of a swinging frame, *d*, and upon which bearings the glass and frame *b* revolve freely.

The swing-frame *d* is suspended freely between two standards, *f*, of a frame or pedestal, the object of the swing-frame being to render the action of the sand-glass more delicate, and also equally reliable whether the surface upon which the frame or pedestal stands is exactly horizontal or not. The upper part d^2 of this frame is curved and bent back to serve as a support for the sand-glass at a suitable inclination, as shown in Fig. 1.

f' f' are stops on the standards *f* to limit the movement of frame *d*. From the bulb *a* of the glass an extension, *h*, of the frame *b* projects, the said extension terminating in a hammer-head, *h'*, for striking a bell, *g*, or other alarm, which is hung between the lower ends of the standards, or in other convenient position.

j is an arm projecting from the bulb *a'*, at right angles, or nearly so, to the longitudinal axis of the sand-glass. This arm is screw-threaded, and carries a nut, *i*, which serves as an adjustable weight to regulate, by its position on the arm *j*, the amount of sand that must run out, and consequently the time that must elapse, before the upper end of the sand-glass will overbalance the other, and thus cause the glass to invert itself.

The action of this improved egg-boiler is as follows: The bulb *a*, containing the sand, is turned upward, and rests against the frame *d*, as represented in Fig. 1. In this position the weight of the hammer-head *h'* brings the center of gravity of the sand-glass above its center of oscillation, *c*, and it is consequently top-heavy. When sufficient sand has run into the other bulb, *a'*, to bring the glass to a vertical position, it overbalances and becomes entirely inverted, as shown in Fig. 2, and the hammer consequently strikes and sounds the bell, the glass remaining in this position, and the sand running back from bulb *a'* to bulb *a*, in readiness for use again.

Having thus described my invention, what I claim as new is—

1. A sand-glass mounted on a horizontal axis, and weighted so that when supported in a nearly vertical position it will overbalance when the sand has run from one bulb into the other, and thus cause an alarm to be given, substantially as herein shown and described, for the purpose specified.

2. The combination, with a sand-glass hung on a horizontal axis, and so weighted that it will overbalance, as herein specified, of a regulating nut or weight adjustable upon a screw-threaded arm, so that the sand-glass may be made to overbalance when more or less of the sand has run out, substantially as herein shown and described.

3. The combination, with a pedestal or frame, *f*, of a sand-glass mounted on a horizontal axis and weighted, as herein described, a swing-frame in which the axis of the sand-glass is

mounted, and which is itself also hung on centers in said pedestal or frame, substantially as and for the purposes herein specified.

4. The combination of the sand-glass mounted on a horizontal axis, the swing-frame hung on centers, as described, and provided with the backward-inclined portion d^2, and the standards having stops to limit the movement of said frame, so that the latter will support the sand-glass at the proper inclination while the sand is running out, substantially as specified.

5. The combination, with a sand-glass, *a* *a'*, of the frame *b*, in which it is fixed, the hammer *h*, the bell, the regulating screw and nut *j i*, the horizontal axis *c*, the swing-frame *d*, supporting the axis *c*, and hung on centers *e* in standards *f*, all arranged and operating substantially as and for the purpose specified.

The above specification of my invention signed by me this 14th day of November, 1877.

JOAQUIM ANTONIO DE MACEDO.

Witnesses:

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T. W. KENNARD.