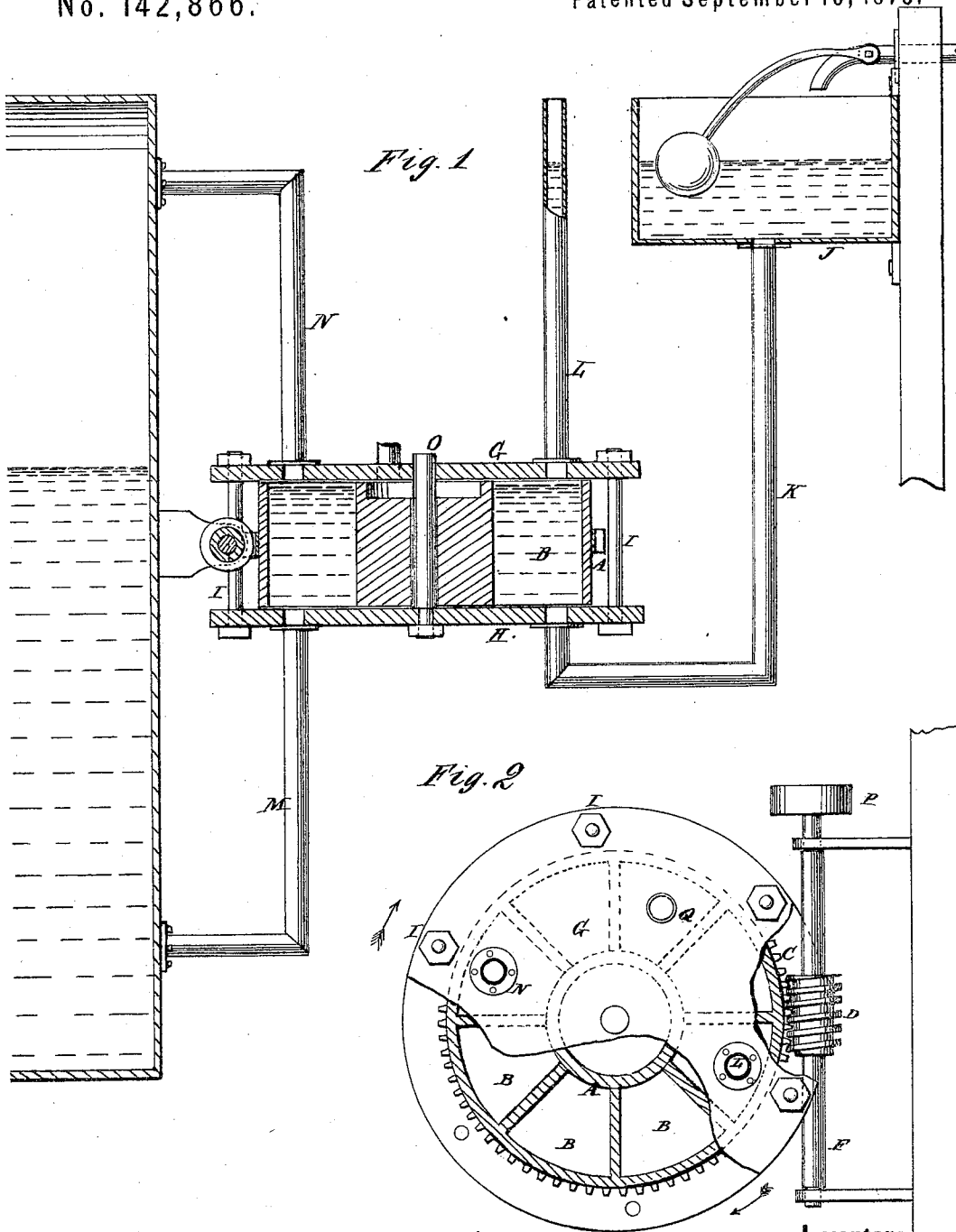


R. RAFAEL.
Boiler-Feeders.

No. 142,866.

Patented September 16, 1873.



Witnesses:
A. W. Almqvist
S. Edquist

Inventor:
R. Rafael
Per *[Signature]*
Attorneys.

UNITED STATES PATENT OFFICE.

RAFAEL RAFAEL, OF HAVANA, CUBA.

IMPROVEMENT IN BOILER-FEEDERS.

Specification forming part of Letters Patent No. **142,866**, dated September 16, 1873; application filed April 26, 1873.

To all whom it may concern:

Be it known that I, RAFAEL RAFAEL, of Havana, in the island of Cuba, have invented a new and useful Improvement in Boiler-Feeders, of which the following is a specification:

The object of this invention is to furnish an automatic water-feeder for steam-boilers, which shall be simple in construction and effective in operation. The invention consists in the improvement of boiler-feeders, as hereinafter described and pointed out in the claim.

In the accompanying drawing, Figure 1 is a vertical section of the entire arrangement, showing the steam-boiler, cylinder, and reservoir. Fig. 2 is a top view of the cylinder with parts broken away to show the chambers and mode of revolving it.

Similar letters of reference indicate corresponding parts.

A is the many-chambered cylinder. B represents the chambers, of which there may be eight, more or less. The periphery of this cylinder is provided with cogs C, which engage with the perpetual screw D of the driving-shaft F, by means of which the cylinder is slowly revolved. The cylinder is placed between two plates—an upper plate, G and a lower plate, H—which are secured together by the bolts I. The cylinder revolves water-tight between these plates, the contact surfaces being ground so as to make tight joints, and still allow the cylinder to revolve. J is the feed-water reservoir or tank. K is a pipe, attached at one end to the bottom of the tank; its other end connects with the lower plate H, which has an aperture to allow of communication with the chamber of the cylinder. L is a pipe, which is attached over an aperture in the upper plate G. This pipe is open, and extends as high as the top of the tank, and the feed-water rises therein as high as the surface of the water in the tank, as seen in the drawing. M is a pipe, which is attached over an aperture in the lower plate at one end; its other end connects with the water-space of the boiler. N is a pipe, which connects with the upper plate and with the steam-space of the boiler. The above-described arrangement

is plainly seen in Fig. 1. O is the central shaft, upon which the cylinder revolves.

The operation is as follows: The water descends through the pipe K and fills one of the chambers B, the air contained in the chamber being forced out through the pipe L, in which pipe the water rises to a level with the water in the tank. Power being applied to the pulley P on the worm-shaft, the cylinder is slowly revolved, and the full chamber B is carried round to the discharge-pipe M, while other chambers are filling and being moved in the same manner. When the chamber B reaches the pipe M the water is subjected to boiler-pressure of steam by means of the steam-pipe N, and if there is a deficiency of water in the boiler the water in the chamber will fall by its own gravity, and the chamber will move along filled with steam until it reaches the orifices Q in the upper plate, when the steam will be discharged. The cylinder thus keeps revolving, and the chambers constantly discharging water in sufficient quantity to keep the water in the boiler up to the desired level. This boiler-feeder works to perfection. The plates G H are arranged to be properly adjusted to the cylinder, so that there need be no unnecessary friction. The movement of the cylinder is slow and sure, the speed being regulated by the requirements of the boiler.

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

The many-chambered revolving cylinder A, having open pipe L, and supplied by gravity from a reservoir, J, by a connecting-pipe, K, in combination with a steam-boiler connected therewith at the top by a pipe, N, leading from the steam-space, and at the bottom by a pipe, M, leading from the water-space, as and for the purpose described.

The above specification of my invention signed by me this 14th day of March, 1873.

RAFAEL RAFAEL.

Witnesses:

JOS. A. RAPHEL,
Consular Clerk.

D. W. DUDLER.