G. M. HOPKINS.

Flame-Regulator.

No. 159,677 Patented Feb. 9, 1875

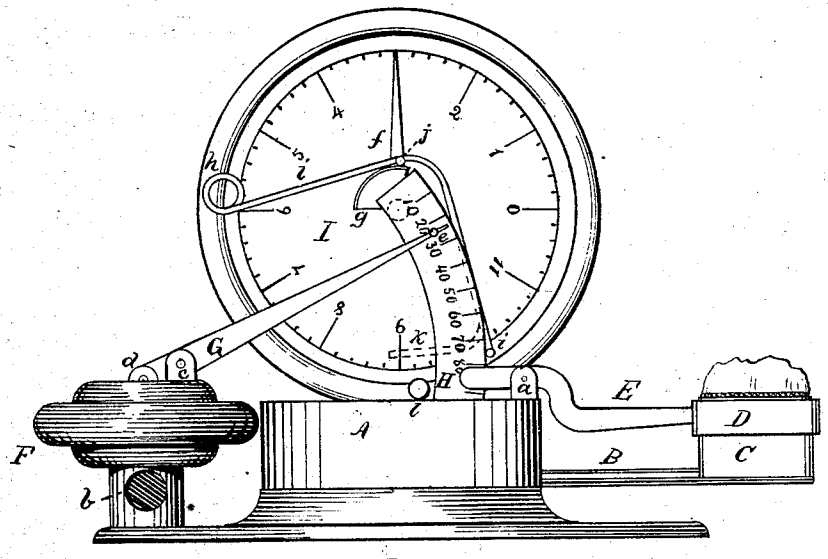

Fig 1

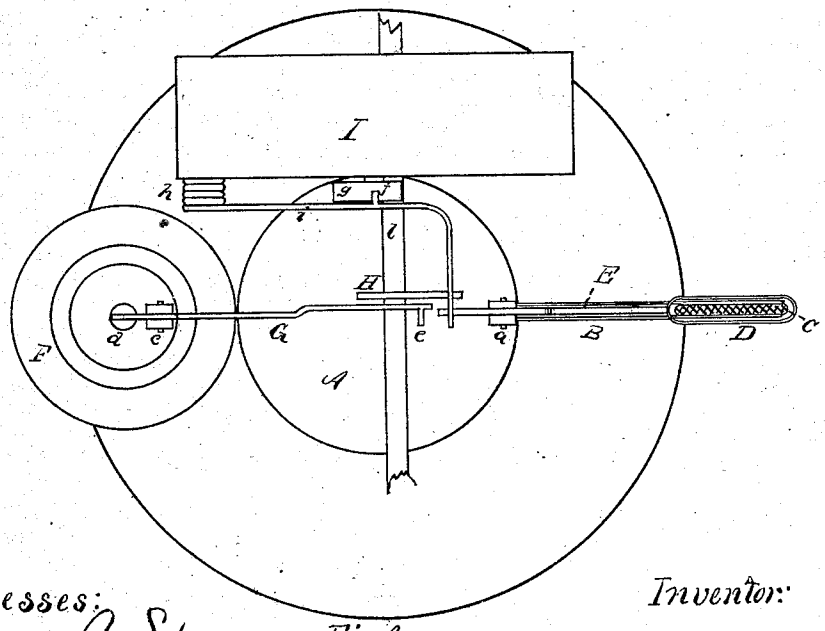

Fig 2

Witnesses:
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Inventor:
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UNITED STATES PATENT OFFICE.

GEORGE M. HOPKINS, OF ALBION, NEW YORK.

IMPROVEMENT IN FLAME-REGULATORS.

Specification forming part of Letters Patent No. **159,677**, dated February 9, 1875; application filed August 31, 1874.

To all whom it may concern:

Be it known that I, GEORGE M. HOPKINS, of Albion, in the county of Orleans and State of New York, have invented certain Improvements in Flame-Regulators and Flame-Extinguishers for Vulcanizers, of which the following is a specification:

The object of my invention is to control the supply of oil or gas burned in the process of vulcanizing, so as to maintain a uniform pressure or temperature, and also to extinguish the flame at the end of the process by shutting off the supply of air which supports the flame where oil is used as fuel. Where gas is used the supply is shut off at the end of the process.

Where oil is used the flame is controlled by means of a diaphragm, (which is acted upon by the steam-pressure,) acting, through suitable levers, upon a slide which surrounds the wick-tube; and the flame is extinguished by throwing this slide up by means of a spring, which is released at the proper time by a clock, with which it is connected.

When gas is used a lever, which is moved by the previously-mentioned diaphragm, is made to compress a piece of thin rubber tubing, through which the gas passes, more or less, as the pressure increases or diminishes, passing the exact amount necessary to maintain a certain pressure, and, at the end of the time required for vulcanizing, a spring is released by means of a clock, which compresses the rubber tube, so as to shut off the gas entirely.

In the drawing, Figure 1 is a side elevation. Fig. 2 is a top view.

A is a reservoir for oil; B, a tube leading to a wick-tube, C. D is a slide, which surrounds the wick-tube, and is attached to the lever E. This lever is pivoted at *a*. F is a diaphragm, which is acted upon by the steam-pressure from the vulcanizer through a pipe, which is connected with the vulcanizer, and is screwed into the regulator at *b*. G is a lever, which is pivoted at *c*, and connected with a port, *d*, which is fixed to the diaphragm F. *e* is a pin, which projects from the lever G, so that it may engage with the lever E. H is a scale, which stands in the rear of the lever G. I is an ordinary clock, having the index *f*, to which is attached the rim *g*. This index takes the place of the hour-hand. *h* is a spring, which is fixed to the side of the clock. A wire, *i*, extends from it nearly across the face of the clock, just in front of the rim *g*. A pin, *j*, projects from the wire, so as to rest on the rim *g*.

When oil is used the wire *i* is bent, so as to engage with the lever E when released by the clock. When gas is used it is bent as shown by the dotted lines *k* in Fig. 1. This brings it over the rubber tube *l*, through which gas passes. This tube is so placed under the lever G that it may be compressed by it as the pressure increases.

The operation is as follows: When oil is used, the wick being lighted and placed under the vulcanizer, the pressure is gradually raised, which, acting on the diaphragm, raises the short arm of the lever E, thus depressing the long arm. When the pressure reaches the prescribed limit the pin *e* touches the lever E, thereby raising the slide D, diminishing the size of the flame to just that which is required to keep up the desired pressure. The index *f* is turned back from the 0-mark on the clock for the time required for vulcanizing, the pin *j* resting on the rim *g*. When the clock carries the index to the 0-mark the pin *j* is let off from the rim *g*, when the wire *i* strikes the lever E, by this means raising the slide D sufficiently to extinguish the flame.

When gas is used the lever G, when depressed, compresses the rubber tube *l*, so as to allow only sufficient gas to pass through to maintain the desired pressure.

The wire *i* is released at the end of the time required for vulcanizing in the same manner as when oil is used, and the extension of the wire *k* (shown by the dotted lines in Fig. 1) is made to press upon the rubber tube with sufficient force to shut the gas entirely off.

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

1. The combination of the lever E, slide D, wick-tube C, lever G, and diaphragm F, substantially as shown and described.

2. The combination of the lever G, diaphragm F, and elastic tube *l*, substantially as shown and described.

3. The combination of the clock I, rim *g*, spring *h*, wire *i*, and elastic tube *l*, as above set forth.

Witnesses: GEO. M. HOPKINS.
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