

(No Model.)

A. BROWN & W. R. CLARK.
FURNACE TUYERE.

No. 328,284.

Patented Oct. 13, 1885.

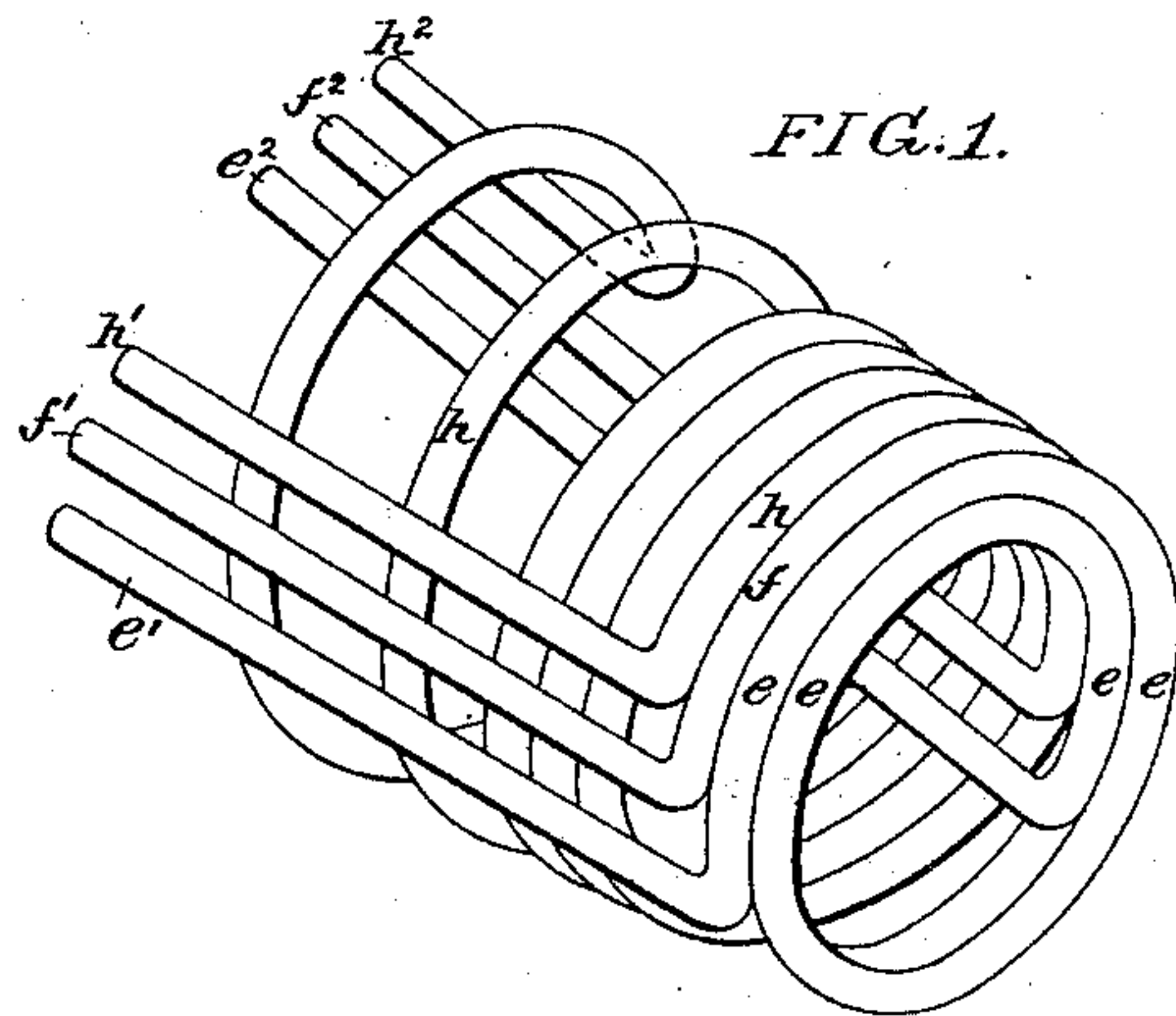


FIG. 2

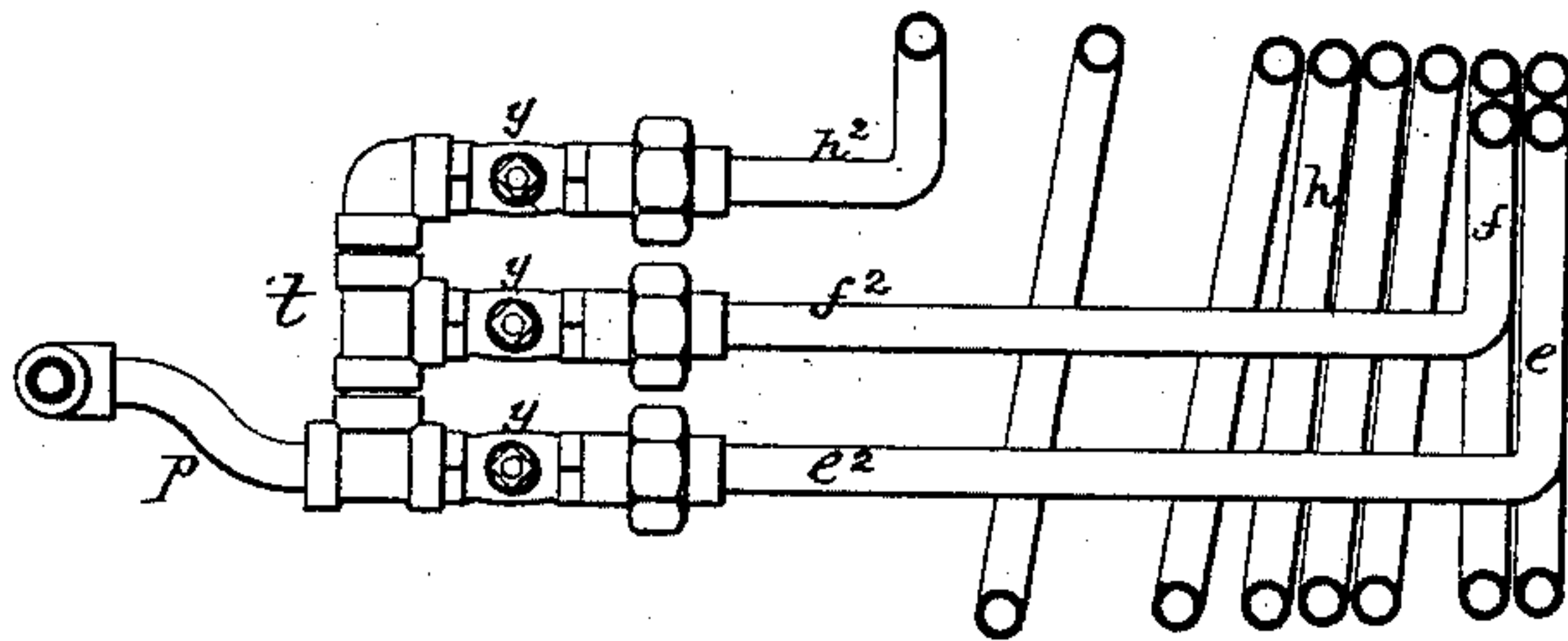
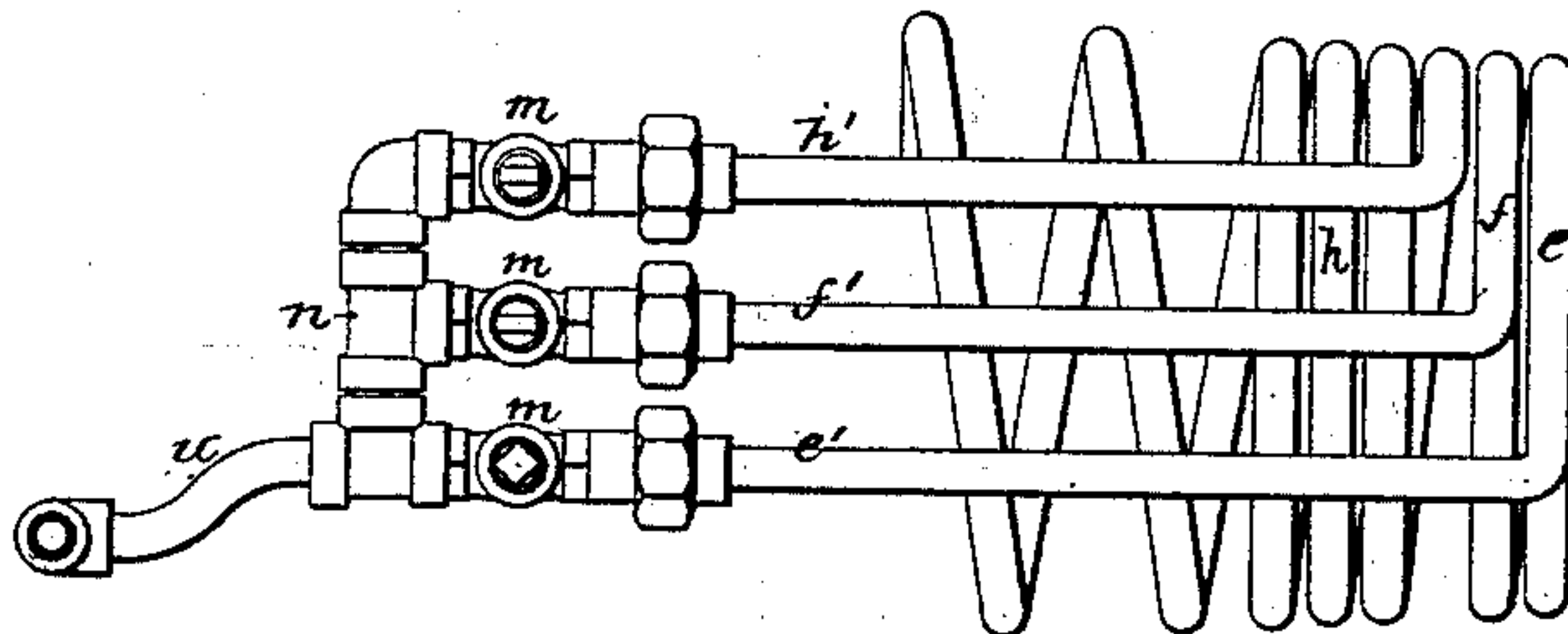


FIG. 3



Witnesses:
John M. Clayton.
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Alfred Brown
and
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by their Attys.
Howson & Sons

UNITED STATES PATENT OFFICE.

ALFRED BROWN, OF HELLERTOWN, AND WILLIAM R. CLARK, OF
BETHLEHEM, PENNSYLVANIA.

FURNACE-TUYERE.

SPECIFICATION forming part of Letters Patent No. 328,284, dated October 13, 1885.

Application filed September 25, 1884. Serial No. 143,933. (No model.)

To all whom it may concern:

Be it known that we, ALFRED BROWN, of Hellertown, Northampton county, and WILLIAM R. CLARK, of Bethlehem, Northampton county, Pennsylvania, both citizens of the United States, have invented certain Improvements in Furnace-Tuyeres, of which the following is a specification.

Our invention consists of an improved form of sectional tuyere, constructed in the manner hereinafter fully described and claimed, so that if partially destroyed by heat it need not be discarded, as the ordinary single tuyeres under such circumstances must be.

In the accompanying drawings, Figure 1 is a perspective view of our improved tuyere. Fig. 2 is a section through the center of the tuyere; and Fig. 3 is a side view.

Our improved tuyere is composed of coiled tubes, so as to constitute two or more circulating-chambers. The outer circulating-chamber is composed of the convolutions *e* of a tube, forming a continuation of the inlet-tube *e'*, and continued to form the outlet-tube *e''*. The second chamber consists of the convolutions *f*, in communication in one direction with the inlet-tube *f'*, and in another direction with the outlet-tube *f''*. The third circulating-chamber is composed of the convolutions *h*, communicating in one direction with the inlet-tube *h'*, and in the other direction with the outlet-tube *h''*. The several convolutions are arranged in the form shown in Fig. 1, and form the tuyere through which the blast is directed to a furnace.

Each of the tubes *h' f' e'* communicates through a cut-off valve, *m*, Fig. 3, when the latter is open, with a connecting-pipe, *n*, the latter in turn communicating with the main outlet-pipe *u*. Each of the tubes *h'' f'' e''* communicates through a cut-off valve, *y*, Fig. 2, with a common connecting-pipe, *t*, to which is attached the main outlet-pipe *p*. These pipes *p* and *u* communicate with a reservoir in the same manner as the inlet and outlet pipes of other tuyeres, so that water shall circulate through the three chambers composed of the different coiled tubes.

As is well known, tuyeres eventually succumb to the destructive action of fire, even if the supply of water through them be constantly maintained, and the first portion of the tuyere to be destroyed is the outer end

nearest the fire. It will be obvious that if a portion—say the outermost coil—of a tuyere of continuous coiled pipe becomes burned and leaky the entire tuyere must be discarded for a new one. Attempts have been made to remedy this by making the tuyere of a casting with separate chambers, but these are somewhat expensive to make.

Our improved tuyere is a comparatively cheap structure, and yet is most effective for its purpose; for if, for instance, the outermost coil, *e*, of our tuyere should be burned and become leaky, all that is necessary is to close the inlet and outlet tubes of that coil by closing their valves *m* and *y*, when the destruction of the coils composing the outermost chamber will continue without disturbing the coils of the other chambers, the tuyere still continuing its functions.

In like manner, when the second coil, *f*, becomes leaky, the further circulation of water through it may be discontinued by closing the valves *m* and *y* belonging to the tubes *f'* and *f''*, after which there will still remain a portion of the tuyere through which the water can circulate.

Our improved tuyere may have two sets of coils, or more than three, but we prefer in most cases a tuyere with three sets of coils. In any case each coil is directly in advance of the other, and the chamber constituted by the coil extends from the center to the outer face of the tuyere.

We claim as our invention—

The combination of a tuyere composed of two or more independent convolutions of pipe, one in advance of the other, with an outlet and an inlet pipe communicating with each independent coil, and cut-off valves therefor, substantially as set forth.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

ALFRED BROWN.

WILLIAM R. CLARK.

Witnesses to the signature of Alfred Brown:
BELL RAUCH,
FR. M. RAUCH.

Witnesses to the signature of William R. Clark:
ELMER J. BARKER,
WALTER S. GREEN.