

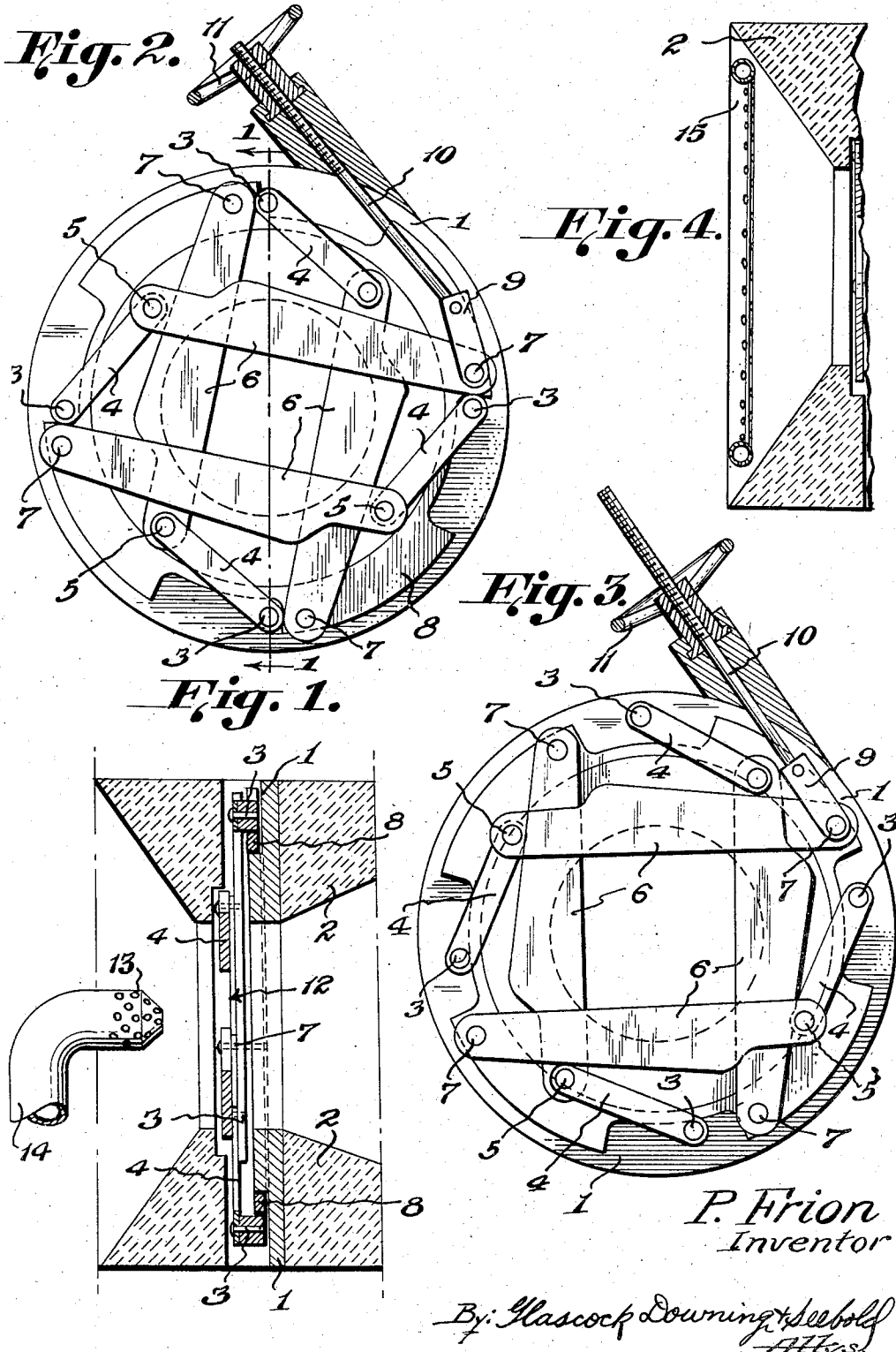
Jan. 24, 1939.

P. FRION

2,144,966

REGULATOR OF COMBUSTION FOR THERMIC FURNACES

Filed Oct. 26, 1936



UNITED STATES PATENT OFFICE

2,144,966

REGULATOR OF COMBUSTION FOR
THERMIC FURNACES

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Application October 26, 1936, Serial No. 107,677
In France November 5, 1935

1 Claim. (Cl. 110-104)

This invention relates to a regulator of combustion for thermic furnaces.

Furnaces which are fed by means of pulverized or powdered coal are, generally speaking, provided with a burner having a constant cross section to which said powdered coal and the air necessary for the combustion of same are brought either jointly or separately under a convenient pressure. Said devices, the construction and the arrangement of which are, as a rule, unchangeable, are established once for all for determined conditions of operation and especially for a determined calorific production for securing the condition to take place in a point strictly located in front of the burner. The known devices of such arrangement are in a position in some degree to regulate the combustion zone from the burner according to the needs, but they are not in a position to reduce for a given combustible the distance existing between said combustion zone and the burner. This results in an insufficient regulation which does not always allow the desirable conditions of operation to be obtained, more especially for what concerns the atmosphere of the furnace.

According to my invention, the mixture of powdered coal and of air is sent into the chamber where the combustion has to take place along a vein having a variable cross section, always similar in shape and projected into the furnace with a variable speed thus allowing at any time the keeping of the combustion zone at a determined point inside the furnace.

In the accompanying drawing which shows by way of example a constructional form of a device embodying the method according to my invention:

Fig. 1 is a sectional view taken along the line I—I of Fig. 2.

Figs. 2 and 3 show in side view in two extreme different positions the mechanism which controls the variation of cross section of the burner.

Figure 4 is a fragmental section illustrating a modified form of an igniting nozzle.

A frame 1 conveniently secured in the masonry-work of the entrance 2 of the furnace is provided with journals 3 in any convenient number (four in the example shown in the drawing) receiving the ends of links 4 the other ends of which receive, through pivots 5, bars 6 each pivotally connected by its free end upon a journal 7 located on a common support 8 having the shape of a crown, rotatably located in the annular frame 1.

A controlling link 9 connected with one of journals 7 is articulated at the end of a screw

threaded rod 10 provided with hand-wheel 11 which allows the whole to vary its position for bringing the parts from the position of Fig. 2 to the position of Fig. 3 which correspond to the minimum cross sectional area and to the maximum cross sectional area of the orifice of the burner, respectively.

Each of the bars 6 is in the form of a shutter, the shutters being conveniently located so as to cover one another in part, said covering being more or less important according to the position of said bars or shutters 6, somewhat in the manner of an iris diaphragm of a photographic camera, the whole of bars 6 being shown in a purely diagrammatical way at 12 in Fig. 1.

The furnace itself comprises any desired construction and the feeding of pulverized coal of said furnace may offer any desired arrangement not shown in the drawing.

The operation is as follows:

For the starting of the furnace, the lighting of same is first effected in the usual manner by sending through nozzle 13 a combustible gas which is lighted and projects a flame inside the furnace in which it causes the inflammation of the pulverized coal which is sent at the same time into said furnace in the usual manner.

Once said pulverized coal is perfectly lighted, the feeding of combustible gas through nozzle 13 is cut off, the operation of said furnace being then effected only by means of pulverized coal.

According to the point where the beginning of the combustion zone is to be placed inside the furnace, the hand-wheel 11 is acted upon for causing by the rotation of part 8 the displacement of bars or shutters 6 which may be brought into one of the extreme positions of Figs. 2 and 3, or an intermediate position thus determining the formation, between said bars or shutters, of a free orifice the cross section of which may have an area varying from that shown in Fig. 2 to that shown in Fig. 3. It is thus possible to obtain a conveniently changeable area of the cross section of the feeding burner of the furnace with a corresponding speed of the combustible mixture constituted with pulverized coal and air.

Due to the described arrangement, however, the shape of the cross section of the jet of combustible mixture is constantly the same with the cross section chosen at the time the device is constructed. It is thus possible to obtain the desired variation of the conditions of operation of the furnace while however keeping in an absolute manner the combustion zone in the axis of the burner, an essential condition for a conven-

ient operation of a furnace and more especially of a rotating furnace.

It is of course possible to vary the cross section area of the burner by means of any controlling device instead of being controlled through the hand-wheel 11.

The number of parts such as bars or shutters 6 and links 4 may also vary according to circumstances and according to the shape which it is desired to give to the orifice of said burner.

It is possible to locate in the vicinity of the burner, for instance in the path of the mixture of pulverized coal and air, an additional burner or any other pre-heating device which permits the bringing of said mixture to a high temperature favouring the inflammation of the same in the furnace, thus also allowing the variation of position of the inflammation point of the combustible mixture, for varying the beginning of the combustion zone in said furnace.

In the constructional form of Fig. 1, a nozzle 13 located in the axis of frame 1 is provided with convenient perforations, and fed by a conduit 14 which brings to the orifice of said burner a combustible gas either alone or mixed with air, and the combustion of which inside the vein of pulverized coal and air causes a convenient heating of said vein to take place.

Conduit 14 may be provided with convenient regulating and obturating members such as vanes, valves or the like, located at any place and which may be controlled either by hand or automatically more especially for lighting the furnace. In that latter case lighting gas or another combustible fluid is sent at the time of lighting of the furnace, through nozzle 13, and the combustion of said fluid at the entrance orifice of the burner heats the mixture of pulverized coal and of air, the feeding of combustible gas through nozzle 13 being cut off once the operation of the furnace conveniently started. Such a cutting off may be obtained either by hand or automatically in any convenient manner.

It is also possible and more especially when no hot air is available for the operation of the furnace, to maintain a feeding of lighting gas

or of other combustible fluid through nozzle 13 during the normal operation of the furnace, in order to obtain a conveniently adjustable pre-heating of the combustible mixture sent into the furnace.

Nozzle 13 may, of course, be located in any point of the burner and could also offer the shape of a crown 15 as in Fig. 4, said crown being located in any convenient place in front of the burner, the additional burner constituted either by the central nozzle 13 or the annular nozzle 15, being fed by any convenient combustible either gaseous or liquid.

The several parts may be made of any convenient substance owing to the fact that combustion zone may always be kept sufficiently far from the parts of the burner for preventing said parts from being overheated.

My invention applies to any furnaces fed with pulverized coal or any other combustible such as for instance lighting gas, high furnace gas, gazo-gen gas or the like for any furnaces and more particularly for rotating furnaces.

What I claim is:

In a device for regulating the combustion of pulverized coal in furnaces, the combination with an annular support including a stationary element and a rotatable element through which pulverized coal and air are passed into the furnace, a plurality of bars constituting shutters each having one end pivoted to the rotatable element of the support in such manner as to form a substantially movable square defining the shape of the opening, links pivoted to the outer ends of the bars and to the stationary element of the support, an operating member operably mounted on the stationary element of the support and operably connected to the rotatable element of the support and to one of the bars, and a control member cooperating with the operating member for adjusting the latter and consequently the position of the bars to vary the size of the opening defined thereby without altering the shape thereof.

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