Nov. 3, 1931. W. F. MORTIMER 1,830,036

DRAFT REGULATOR

Filed Dec. 20, 1929

FIG. 1

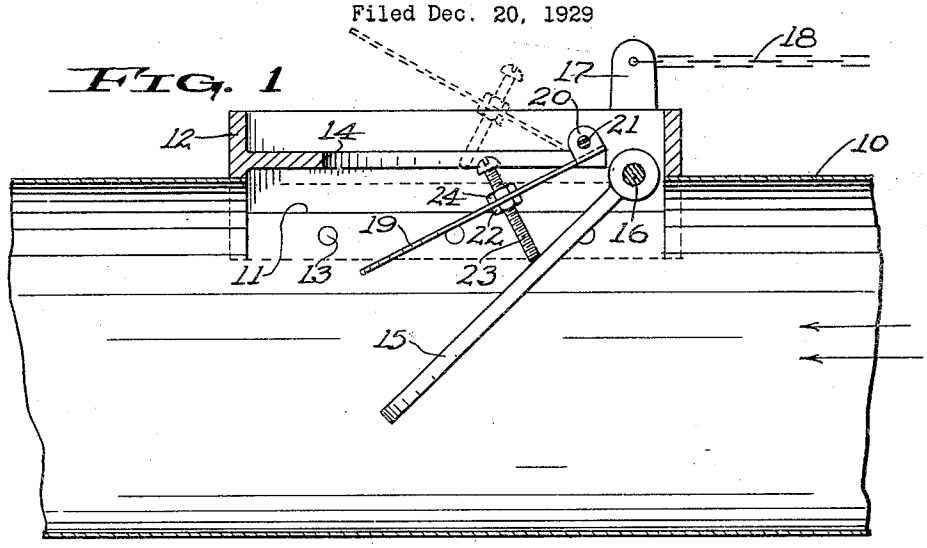


FIG. 2

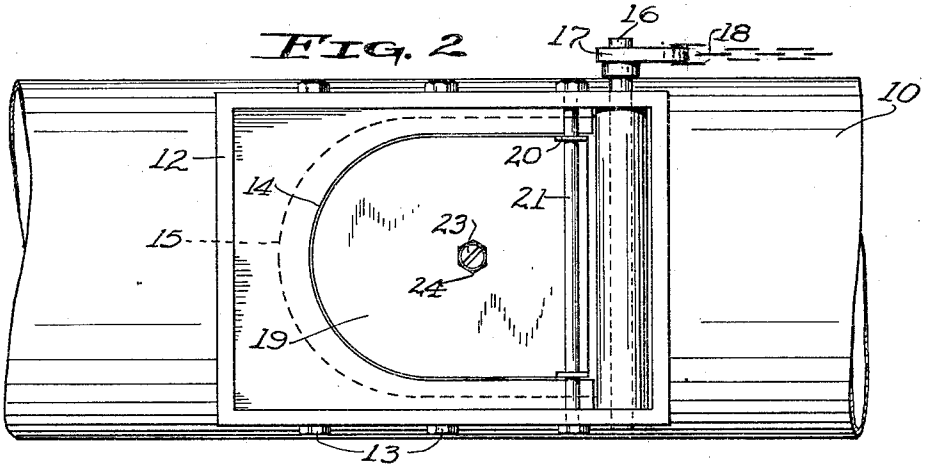
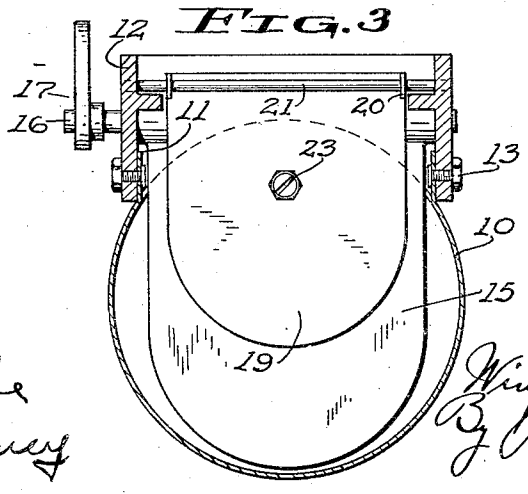


FIG. 3



WITNESSES

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UNITED STATES PATENT OFFICE

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DRAFT REGULATOR

Application filed December 20, 1929. Serial No. 415,476.

The invention relates to draft regulators and has for an object the provision of a simple, durable and inexpensive device which will serve the functions of both a check draft and a smoke pipe damper, to thereby facilitate regulation of the draft.

Another object of the invention is to provide a device of this character including a pair of simultaneously movable, angularly adjustable plates which are pivotally mounted to swing within a smoke pipe from a position adjacent the side of the smoke pipe, where one plate acts as a check draft, to a position transversely of the smoke pipe, where the other plate acts as a smoke pipe damper, the relative angular adjustment of the plates serving to insure efficient operation of the furnace with different chimney drafts.

The invention further consists in the several features hereinafter set forth and more particularly defined by the annexed claims.

In the accompanying drawings, Fig. 1 is a fragmentary sectional elevation of a smoke pipe embodying the draft regulator of this invention, the damper elements being shown in an intermediate position,

Fig. 2 is a top plan view of the draft regulator; and

Fig. 3 is a transverse sectional elevation of the smoke pipe showing the draft regulator acting as a smoke pipe damper.

In these drawings, the numeral 10 designates a smoke pipe which as usual connects a chimney, not shown, with a furnace or boiler, not shown. The smoke pipe is here shown to include a horizontally extending portion but, in some instances, this pipe may assume other positions. An opening 11 is formed in the upper side of the smoke pipe over which is fitted a casing 12 saddled onto the pipe and secured thereto in any suitable manner, as by means of bolts or rivets 13. The casing 12 includes arcuate portions fitting about the smoke pipe, which is here shown to be of circular cross-section, and other portions which are flat and arranged substantially parallel to the axis of the smoke pipe. The flat portion of the casing is provided with an aperture 14 which defines a check draft opening.

A plate 15 forming a smoke pipe damper is provided along one edge with horizontally extending shaft extensions 16 which are journalled in the casing 12, thus permitting the plate to swing in a vertical plane about the shaft extensions from a position adjacent the check draft opening 14 in the casing to a depending position transversely within the smoke pipe, the latter position of the plate being shown in Fig. 3. The plate 15 is urged to its depending position by its weight. An arm 17 is secured to one of the shaft extensions 16 and is connected with an actuating chain or cord 18 for urging the plate upwardly from its depending position.

A plate 19 of smaller size than the plate 15 is provided with laterally extending apertured ears 20 which are journalled on a horizontally extending rod 21 having its opposite end portions secured in the opposite side walls of the casing 12, the rod 21 being arranged adjacent the axis of the plate 15 and parallel thereto. The plate 19 is adapted to swing to a horizontal position in which it closes the check draft opening 14, the plate being slightly smaller than this opening in order that it may swing through it in either direction, thereby permitting the plate to attain the upper dotted line position seen in Fig. 1. A nut 22 is secured to the underside of the plate 19 in register with an aperture therein and has adjustably threaded therethrough a screw 23 the lower end of which abuts against one face of the plate 15 to vary the distance between the plates, the screw being retained in adjusted position by a lock nut 24. The weight of the plate 19 keeps the screw 23 in abutment with the plate 15, so that the plates 15 and 19 are swung simultaneously under the control of the chain or cord 18.

When the plate 19 fully closes the check draft opening 14, free flow of gases through the smoke pipe occurs under the influence of chimney draft and in the direction indicated by arrows. The draft of different chimneys varies considerably, whereas, any given furnace operates most efficiently with a certain amount of draft. In order to arrive at a satisfactory draft for the furnace, the relative angular displacement of the plates 15 and 19 is varied by means of the screw 23,

so that in any given angular position of the damper plate 15, as exemplified in Fig. 1, the effective size of the check draft opening may be suitably adjusted. When the plate 19 fully closes the check draft opening 14, the damper plate 15 will then project into the smoke pipe an adjustable distance to vary the effective size of the smoke pipe opening. When the chimney draft is relatively strong, the plates 15 and 19 will be arranged close together, and when the chimney draft is weak the plates will be spaced farther apart.

In operation, the plates 15 and 19 are moved simultaneously under the control of the chain or cord 18 secured to the lever 17. When maximum draft is desired, the plate assembly is swung upwardly by means of the chain until the plate 15 closes the check draft opening 14, and when the draft on the furnace is to be minimized, the plate 15 is swung to the vertical depending position seen in Fig. 3. In the latter position of the damper plate 15 there is still clearance about the edge of the plate to permit sufficient flow of gases through the pipe. Various intermediate conditions of draft on the furnace are secured by simultaneously swinging the plates 15 and 19 to different angular positions. In the event of an explosion within the furnace, the plate 15 is swung upwardly by the exploding gases into abutment with the flat portion of the casing 12, thus closing the check draft opening 14 to provide maximum draft, the plate 19 swinging through the check draft opening 14 and to the upper dotted line position seen in Fig. 1.

When the furnace is connected to a chimney flue having a weak draft and the furnace is in normal operation, the plate 19 is set so as to almost close the check draft opening, while the smoke pipe damper 15 is in a position such as shown in Fig. 1, partially obstructing the flow of gases from the furnace. This adjustment of the check draft damper, however, does not limit the movement of the smoke pipe damper 15 to a position permitting the maximum draft, since the former damper is free to move the check draft opening.

What I claim as new and desire to secure by Letters Patent is:

1. A draft regulator comprising a conduit forming part of a smoke pipe and having an aperture forming a check draft opening, a plate swingably mounted within said conduit and forming a smoke pipe damper, a second swingably mounted plate controlling said chack draft opening and movable therethrough, means for simultaneously moving said plates, and means for adjusting the relative positions of said plates to vary the effective size of the check draft opening for any given angular position of said first-named plate.

2. A draft regulator comprising a conduit forming part of a smoke pipe and having an aperture forming a check draft opening, a plate swingably mounted within said conduit and forming a smoke pipe damper, a second plate swingably mounted within said conduit adjacent said first-named plate and controlling said check draft opening, and an adjustable connection between said plates for determining the simultaneous movement of said plates and for adjusting the relative positions of said plates to vary the effective size of the check draft opening with any given angular position of said damper plate, said second plate being movable through said check draft opening and said first plate being movable to a position closing said check draft opening.

3. A draft regulator comprising a conduit forming part of a smoke pipe and having an aperture forming a check draft opening, a swingably-mounted plate within said conduit forming a smoke pipe damper and movable to a position closing said check draft opening, a second swingably mounted plate normally controlling said check draft opening and adapted to pass through said opening, and means for simultaneously moving said plates.

4. A draft regulator comprising a conduit forming part of a smoke pipe and having an aperture forming a check draft opening, a smoke pipe damper disposed within said conduit and swingably mounted thereon for movement to a maximum draft position adjacent said check draft opening, a swingably mounted check draft damper within said conduit controlling said check draft opening, and means for adjustably connecting said plates for simultaneous movement and permitting the full opening of said smoke pipe damper independently of the relative position of said plates.

In testimony whereof I affix my signature.

WINFIELD F. MORTIMER.