July 29, 1952 W. J. MASONER 2,605,097

SPRING HOLDER

Filed May 16, 1950

Fig. 1.

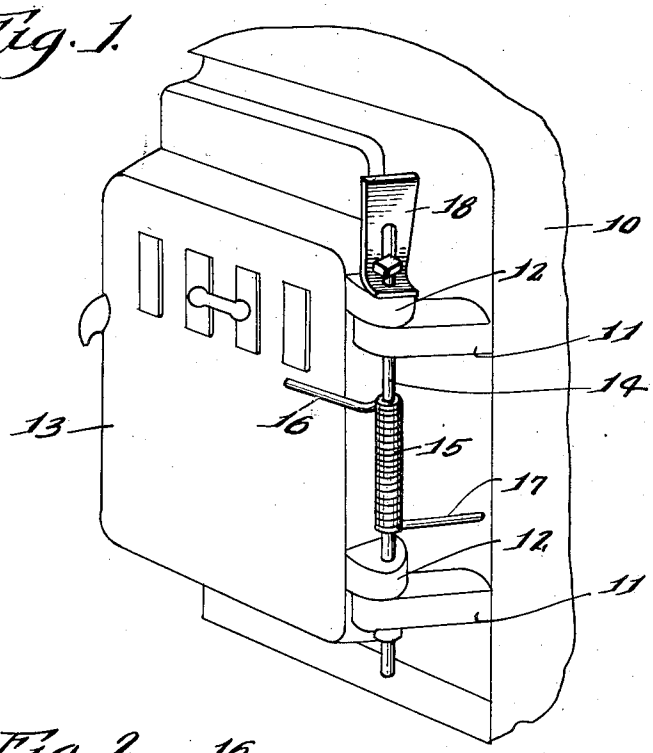
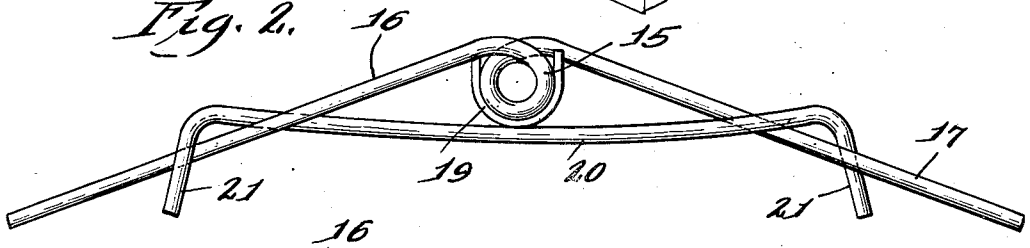


Fig. 2.



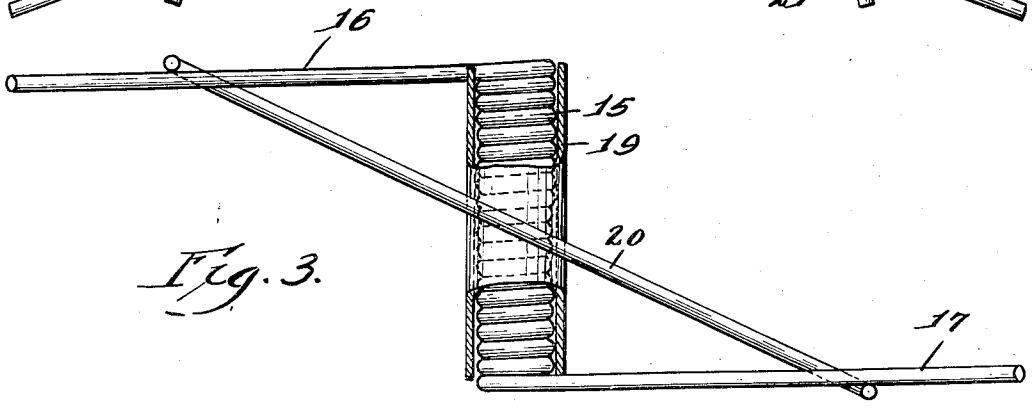


Fig. 3.

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SPRING HOLDER

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2 Claims. (Cl. 267—1)

1

My invention relates to a spring holder and is concerned primarily with an arrangement for facilitating the installation of a spring actuated closer for furnace and boiler doors.

In coal fired furnaces or boilers which are converted for the use of gas or oil, there is an occasional, so-called excess pressure developed when the burner ignites. Since the fire door is firmly held by the usual catch, this pressure must be dissipated through the flue pipe to the chimney, but if the rate of dissipation is insufficient, the flue pipe may be ruptured and serious damage may be caused to the boiler or furnace.

To meet this situation, the door catch is removed and the door is held closed under spring tension which enables the door to open and relieve a critical pressure in the boiler and thereafter automatically close. A typical, door closer installation of this character includes a spring helix of appropriate length having an arm extending laterally from each end of the helix for respectively bearing against the boiler door and the adjacent stationary wall of the boiler. A hinge pin extends through the upper and lower hinge lugs of the door and boiler and also through the convolutions of the helix.

As furnished to the installer, the spring is untensioned and the arms extend generally in the same direction from the helix. Before mounting the spring, it is necessary to tension the spring by relatively rotating the arms and to thereafter insert the hinge pin lengthwise through the helix. The weight of the door and the friction between the hinge lugs requires a spring pressure that is difficult to maintain by hand during installation. Further, it is difficult, while the spring is under tension, to maintain a satisfactory alignment of the helix convolutions so that the hinge pin can be inserted therethrough.

It is therefore one object of my invention to devise a holder for a door closer of the above type which mechanically maintains the spring under tension during installation.

A further object is to provide a holder of the character indicated which additionally includes means for maintaining the alignment of the spring convolutions to permit the easy insertion of the hinge pin.

A further object is to provide a holder whose component elements are automatically released by swinging the fire door to further tension the spring.

These and further objects of the invention will be set forth in the following specification, reference being had to the accompanying drawing,

2

and the novel means by which said objects are effectuated will be definitely pointed out in the claims.

In the drawing:

Fig. 1 is a perspective view of a boiler equipped with a spring actuated, door closer forming part of the invention.

Fig. 2 is an endwise view of the spring shown in Fig. 1 and conditioned by the holder for easy attachment to the boiler.

Fig. 3 is a side elevation of the holder and spring, partly in section.

Referring to Fig. 1, the numeral 10 designates a boiler having spaced hinge lugs 11—11 on which are rested the usual spaced, hinge lugs 12—12 forming part of a fire door 13. A hinge pin 14 extends through the lugs 11 and 12 and between the upper lug 11 and the lower lug 12, the pin extends through a tensioned spring helix 15 from which extends upper and lower arms 16 and 17 that bear against the door 13 and a stationary part of the boiler, all respectively. If an excess pressure is created in the combustion chamber, the door 13 acts as a relief valve and opens against the pressure of the spring which automatically closes the door when the pressure is relieved. A wedge plate 18 is loosely mounted on the upper end of the pin 14 and is employed to hold the door open for servicing and inspection.

The foregoing represents a characteristic installation, but owing to the flexibility of the helix and the fact that the arms must be manually relatively rotated to set up the desired tension, considerable difficulty is encountered in maintaining the alignment of the helix convolutions and the desired tension while inserting the hinge pin through the helix. This problem is successfully solved by the holder shown in Figs. 2 and 3 to which reference will now be made.

The helix 15 and the associated arms 16 and 17 are composed of spring wire of an appropriate gage and when the helix is untensioned, the arms extend generally in the same direction therefrom. The helix is placed in a U-sleeve 19 whose length may be about equal to that of the helix and in any case extends along a major portion of the length thereof, while the depth of the sleeve transverse section is about equal to the diameter of the helix. The arms 16 and 17 are then relatively rotated to establish the required tension in the helix and this tension is slightly greater than that in the helix when finally positioned as shown in Fig. 1. When the helix has thus been tensioned, the arms 16 and 17 extend generally in opposite directions therefrom as shown in Fig. 2

and are held in these relative positions by a rod 20 having hooked ends 21—21 formed by laterally bending the ends of the rod. The ends 21 respectively engage the arms 16 and 17 to prevent their unwinding, while the intermediate portion of the rod 20 is pressed against the curved portion of the sleeve 19 whose open side faces away from the rod. The sleeve is accordingly maintained in position during shipment and until the spring is ready for installation.

To accomplish this result, the hinge pin 14 is inserted through the upper hinge lugs 12 and 11, thence through the helix 15, and through the lower hinge lugs 12 and 11. The helix 15 and its associated parts then occupy the relative positions shown in Fig. 2 and this assembly is located so that the helix lies between the fire door and the rod 20, or in other words, the rod lies outwardly of the assembly. The fire door 13 is then opened and after the arm 17 abuts the boiler wall, further pressure of the door against the arm 16 frees the hooks 21 since this door movement further tensions the spring so that the rod 20 and the sleeve 19 may be easily removed. The arm 16 then closes the door and the installation is complete, there being sufficient tension remaining in the helix after being partially unwound when the rod is removed. The sleeve 19 is an important feature of the invention since it maintains the alignment of the helix convolutions and hence permits easy insertion of the hinge pin.

I claim:

1. The combination of a spring helix, an arm extending laterally from each end of the helix, a stiff, U-sleeve member extending substantially the length of and substantially enclosing the helix to maintain the alignment of the convolutions thereof, and a rod extending between and having hook-like parts at the ends thereof attachable to the arms, respectively, for maintaining the arms in positions setting up a tension in the helix, the intermediate portion of the rod bearing against the curved part of the member to hold the same in position and the helix including a passage extending axially therethrough.

2. The combination of a spring helix, an arm extending laterally from each end of the helix, a stiff U-sleeve member extending substantially the length of and substantially enclosing the helix to maintain the alignment of the convolutions thereof, and a straight rod extending between and having normally related, hook-like parts at the ends thereof attachable to the arms, respectively, for maintaining the arms in positions setting up a tension in the helix, the intermediate portion of the rod bearing against the curved part of the member to hold the same in position and the helix including a passage extending axially therethrough.

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REFERENCES CITED

The following references are of record in the file of this patent:

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Number	Country	Date
15,208	Denmark	Oct. 23, 1913