

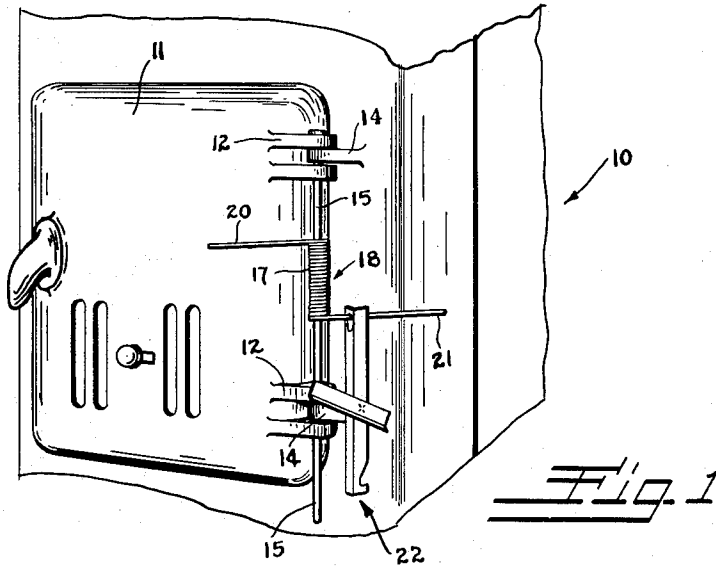
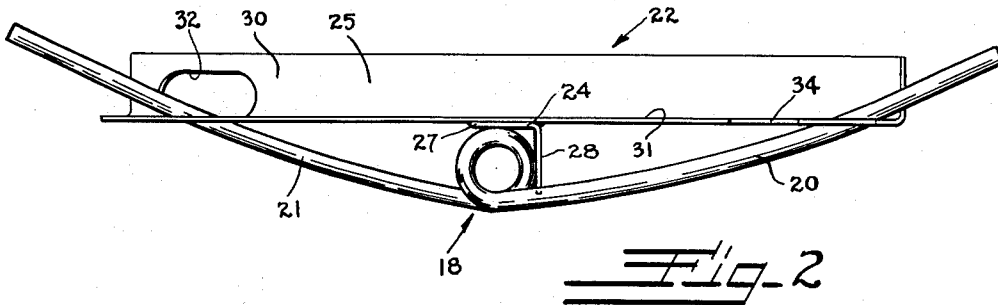
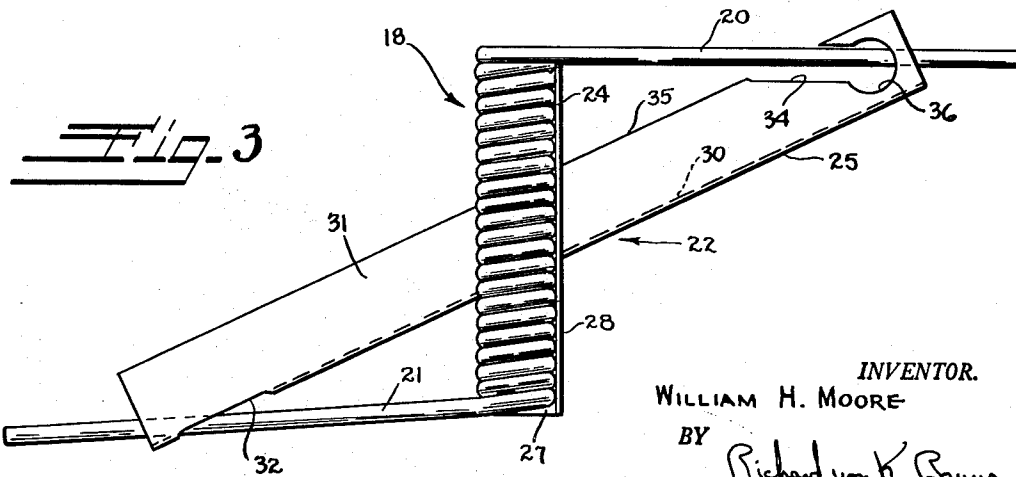
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SPRING DOOR CLOSER AND TENSIONING MEANS THEREFOR

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1

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SPRING DOOR CLOSER AND TENSIONING MEANS THEREFOR

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2 Claims. (Cl. 267—1)

This invention relates to spring door closers, and has particular reference to a novel tensioning device for automatically maintaining proper tension in a spring door closer during installation on a gas or oil conversion furnace.

When a coal fired furnace is converted so that gas or oil fuel may be burned therein, it is highly desirable for safety reasons to permit any excessive pressures which may be built up in the main fire box to be dissipated through the fire door. This, of course, eliminates the possibility of a ruptured flue pipe and damage to the furnace which might otherwise be occasioned by excess pressure due to puff back or delayed ignition.

In order to permit the fire door to act as a relief or safety valve, the door catch may be filed down and the door equipped with a spring door closer in the form of a torsion spring which normally holds the door closed but permits it to be blown open by any excessive pressures. The spring also serves to automatically close the door after the initial high pressure has been dissipated and thus prevents the escape of excessive amounts of flue gases into occupied areas of the residence or other building in which the furnace is located. This torsion spring is usually mounted on a single hinge pin which passes through both the upper and lower hinge lugs, and the spring itself is under tension so that the elongated end portions thereof bear against the fire door and adjacent furnace wall respectively.

Prior to installation, the torsion spring is in relaxed condition with its end portions extending in substantially the same direction from the body of the spring. This means that the spring must be tensioned before being mounted upon the hinge pin, and the task of maintaining the tension by hand while inserting the hinge pin through the upper hinge lugs and spring body is exceedingly difficult to perform and usually requires at least two men.

In order to eliminate the aforementioned installation difficulties, it is the primary object of this invention to provide a torsion spring tensioning device which automatically holds the spring in properly tensioned condition while it is being mounted on the furnace door.

Another important object of the invention is to provide a torsion spring tensioning device which can be disengaged from the spring after the latter has been mounted on the furnace door by simply opening the door to increase the tension on the spring.

A further object of the invention is to provide a torsion spring tensioning device which, after the spring has been properly installed and the device disengaged, can be easily re-engaged to again automatically hold the spring in tensioned condition should it become necessary to remove the hinge pin and furnace door to perform interior work.

Still another object of the invention is to provide a torsion spring tensioning device which is simple and economical to manufacture and yet is very strong and durable.

Other objects and advantages will become apparent

2

from the following detailed description read in connection with the accompanying drawings wherein like reference numbers designate corresponding parts in all the views.

Figure 1 is a perspective view of a furnace fire door equipped with a torsion spring door closer and tensioning device embodying the invention.

Figure 2 is a top plan view of a torsion spring held in tensioned condition by the tensioning device of Figure 1.

Figure 3 is a side elevation of the torsion spring and tensioning device shown in Figure 2.

Having reference now to the drawings which illustrate a typical embodiment of the invention for the purposes of disclosure, 10 generally indicates a fragmentary portion of a furnace having a fire door 11. Door 11 is provided with the usual hinge lugs 12 which receive corresponding lugs 14 integrally formed on the furnace wall. A single hinge pin 15 extends through both the upper and lower sets of lugs as shown. Between the upper and lower sets of lugs the hinge pin passes through the body or helically coiled portion 17 of a torsion spring generally indicated at 18. Spring 18 is provided with elongated end portions 20, 21 which extend tangentially from the body of the spring, and when mounted as shown in Figure 1 is under tension so that the upper end portion 20 bears against the fire door 11 while lower end portion 21 bears against the stationary furnace wall. With this arrangement, the door catch (not shown) is filed down and spring 18 serves to normally hold the door in closed position. In the event of excessive pressure in the main fire box, however, the door will be forced open against the bias of the spring to permit the pressure to be dissipated and will thereafter automatically close.

As pointed out hereinabove, it has been found that maintaining the necessary tension in spring 18 by hand during its installation is an exceedingly difficult task, and the tensioning device, generally indicated at 22, is therefore provided to automatically perform this work. The device 22 comprises a spring engaging member 24 of some suitable material such as sheet metal and a loading bar 25 of similar material which is fixedly secured thereto as by welding. Spring engaging member 24 is substantially equal in length to the length of the spring 18 and comprises integral side walls 27, 28 which are approximately at right angles to one another so that the cross section of the member is substantially V-shaped or in the shape of a trough. The loading bar 25 also comprises a pair of integral walls 30, 31 at approximate right angles to one another so that its cross section and general conformation is similar to that of member 24. It will be understood, however, that the conformation of either member 24 or bar 25 might be varied without changing the function or utility thereof.

As may be best seen in Figures 2 and 3, the wall 30 of bar 25 is formed adjacent one end of the bar with an enclosed slot 32, while the wall 31 is formed adjacent the opposite end of the bar with an open ended slot 34, the latter being angularly disposed with respect to the longitudinal edge 35 of the bar and terminating in a circular opening 36. The bar 25 itself is obliquely disposed with relation to the longitudinal axis of member 24 so that the slot 32 is approximately co-planar with the bottom of the member and the slot 34 is approximately co-planar with the top thereof. As pointed out hereinabove, when the spring 18 is in relaxed position its elongated end portions 20, 21 extend in substantially the same direction. When the spring and tensioning device 22 are assembled at the factory the end portion 21 of the spring is inserted in slot 32 and the end portion 22 is then forcibly turned (in a counterclockwise direction as viewed in Figure 2) until it can be positioned in and held

3

by the slot 34. The spring is then properly tensioned and ready for installation.

In the actual operation of mounting the spring and tensioning device upon the furnace door, the original door hinges are first removed and the single, elongated hinge pin 15 is inserted through the upper set of lugs 12, 14. The assembled spring 18 and tensioning device are then positioned below the end of the hinge pin with loading bar 25 facing the installer, or away from the furnace, and the open-ended slot 34 in elevated position. The position just described is the position that would be shown were Figure 3 of the drawings turned right for left. With the spring and device in this position, the hinge pin is pushed down through the body of the spring and through the lower set of hinge lugs. Thereafter, the door 11 can be swung open and as the door bears against end portion 20 of the spring, the spring tension is increased sufficiently to disengage the portion from the notch 34 which permits the device to drop down out of the way and be suspended from lower end portion 21 by means of notch 32 as shown in Figure 1. This arrangement, of course, permits the device to be re-engaged with the spring to hold it in tensioned condition any time it becomes necessary to remove the hinge pin and fire door.

From the foregoing it will be apparent that the present invention provides a novel and useful spring door closer and tensioning device therefor which successfully eliminates the difficulties heretofore encountered in in-

4

stalling such door closers. The invention can be embodied in other specific forms without departing from the spirit or essential characteristics thereof. The embodiment disclosed is therefore to be considered in all respects as illustrative rather than restrictive, the scope of the invention being indicated by the appended claims.

What I claim is:

1. In a device of the character described, a torsion spring having elongated end portions extending tangentially from the body of the spring, a first V-shaped member adapted to receive said torsion spring between its side walls, said member being approximately equal in length to the length of the spring body, and a second V-shaped member fixedly mounted on one wall of said first member in obliquely disposed relation to the longitudinal axis thereof, said second member having an enclosed slot adjacent one of its ends and an open-ended slot adjacent its other end to releasably secure the elongated end portions of said spring in spring tensioning position.

2. A device as described in claim 1 wherein said enclosed slot is in one wall of said second V-shaped member and said open-ended slot is in the other wall thereof.

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