S. LYON.

FURNACE DOOR OPENER.

APPLICATION FILED OCT. 9, 1909.

**1,000,274.** Patented Aug. 8, 1911.

Fig. 1.

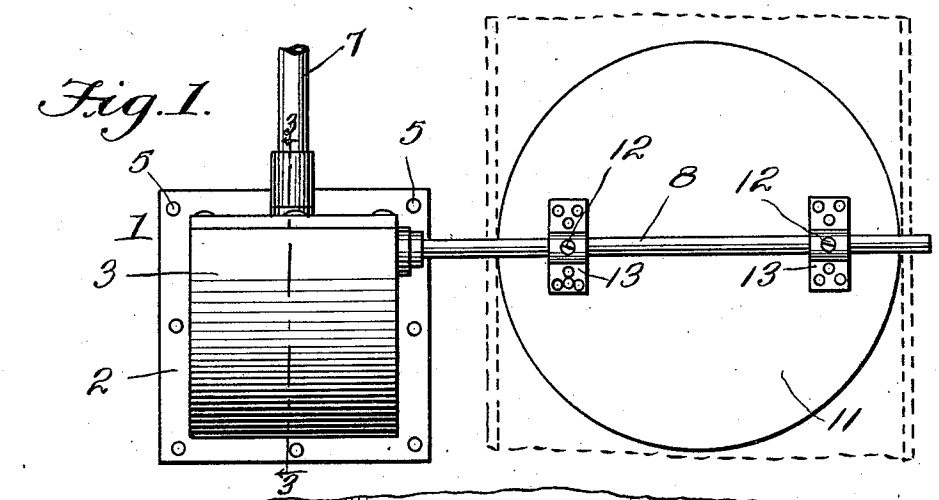



Fig. 2.

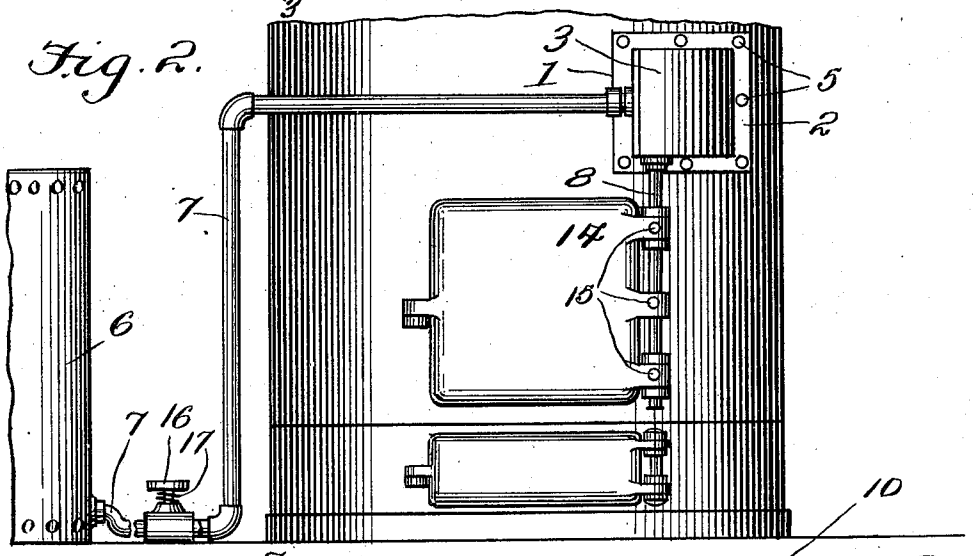



Fig. 3.

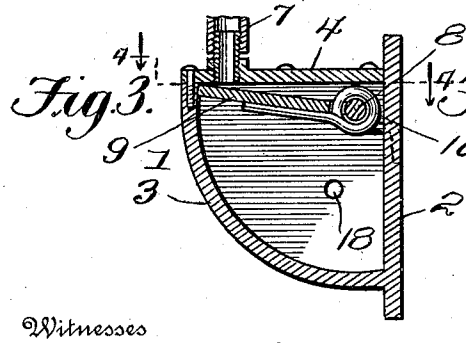
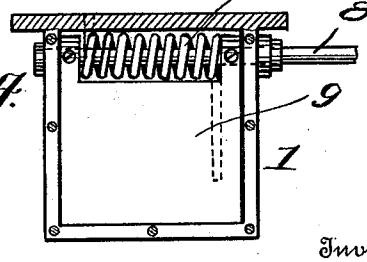



Fig. 4.




Witnesses

J. L. Wright,

E. B. Bunyea.

Inventor

Shepard Lyon,

By Victor J. Evans,

Attorney

# UNITED STATES PATENT OFFICE.

SHEPARD LYON, OF SAULT STE. MARIE, MICHIGAN.

## FURNACE-DOOR OPENER.

1,000,274. Specification of Letters Patent. Patented Aug. 8, 1911.

Application filed October 9, 1909. Serial No. 521,871.

*To all whom it may concern:*

Be it known that I, SHEPARD LYON, a citizen of the United States, residing at Sault Ste. Marie, in the county of Chippewa and State of Michigan, have invented new and useful Improvements in Furnace-Door Openers, of which the following is a specification.

This invention relates to furnace door openers, and one of the principal objects of the same is to provide simple and reliable means for swinging the door of a furnace open for stoking purposes.

Another object of the invention is the provision of means for opening furnace doors or dampers which is simple in construction, thoroughly reliable and efficient in operation, and inexpensive in manufacture.

These and other objects may be attained by means of the construction illustrated in the accompanying drawing, in which—

Figure 1 is a front elevation of the compressed air chamber and a damper made in accordance with my invention. Fig. 2 is a front elevation of a furnace showing my attachment. Fig. 3 is a detail sectional view on the line 3—3 of Fig. 1, looking in the direction indicated by the arrows. Fig. 4 is a sectional view on the line 4—4 of Fig. 3, looking in the direction indicated by the arrows.

Referring to the drawing, the numeral 1 designates an air cell or chamber comprising a base 2, a curved front wall 3 and a plain flat wall 4. The base 2 is adapted to be connected by bolts 5 to any suitable support. A compressed air tank 6 is provided with an outlet pipe 7 which leads into the air cell or chamber. Journaled in the air cell or chamber is a shaft 8, and secured to said shaft within the air cell or chamber 1 is a flat blade or valve 9, said blade being connected to the shaft 8. Surrounding this shaft 8 is a spring 10, said spring being of sufficient strength to hold the blade or valve 9 in the position shown in Fig. 3. Connected to the shaft 8, as shown in Fig. 1, is a damper 11, said damper being secured to the shaft by means of set screws 12 extending through keepers 13 secured to the damper.

As shown in Fig. 2, a furnace door 14 is connected to the shaft 8 by means of set screws 15. A valve 16 in the pipe 7 is disposed near the floor so that it may be operated by the foot, said valve being provided with a spring 17 to return it to its original position after it has been operated.

The operation of my invention may be briefly described as follows:—Whenever the damper 11 requires regulation or whenever it is desired to open the furnace door 14, by placing the foot upon the valve 16 air flows through the pipe 7 from the compressed air tank 6 into the chamber 1 and against the blade or valve 9 to partially rotate the shaft 8 against the tension of the spring 10. Means may be provided for holding the valve open, if desired. However, for use in opening the doors of furnaces this may not be required.

In the bottom of the chamber 1 is provided the necessary orifice or opening 18 the latter being arranged spaced from the base 2 of the chamber so that any air pressure passing behind the flat blade 9 within the chamber will exhaust through the opening 18 and also when the blade has been moved to position for opening either the damper or the door of the furnace by the air pressure admitted within the chamber 1 the said air pressure will be exhausted through the opening 18 to the atmosphere thus permitting the said damper or door to swing to closed position through the medium of the spring 10 acting upon the blade.

From the foregoing it will be obvious that a furnace door opener made in accordance with my invention is particularly useful where it is required to frequently open the door of the furnace for feeding coal to the furnace.

I claim:—

The combination with a draft-controlling element having a turning shaft, of a segment-shaped air cell in alinement with the said shaft and receiving one end thereof, an air impact wing within said cell and fixed at one end edge to said shaft, the said wing being of a length and width corresponding to the length and width of the said cell, whereby the free top, bottom, and remaining end edges of said wing will contact with the top, bottom, and front walls of the cell throughout the movement of the wing, the said wing being cut out at its inner end edge to form a recess intermediate the top and bottom edges thereof, a coiled spring disposed within the said recess and surrounding the shaft supporting the wing, one end of said spring being engaged with the

cell and its opposite end acting upon the wing in normal position, a compressed air tank, an air supply pipe leading from the tank to said cell at a point contiguous to the outer end edge of the said impact wing, the air adapted to swing it to open position against resistance of the spring, the said cell being provided with an exhaust port, and a valve within the supply pipe for normally shutting off the supply of air from the tank to the cell.

In testimony whereof I affix my signature in presence of two witnesses.

SHEPARD LYON.

Witnesses:
REUBEN SMITH,
HENRY E. COULTER.