No. 685,886. Patented Nov. 5, 1901.

F. L. VOEGELEIN.

FURNACE DOOR OPERATING MECHANISM.

(Application filed Apr. 4, 1901.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

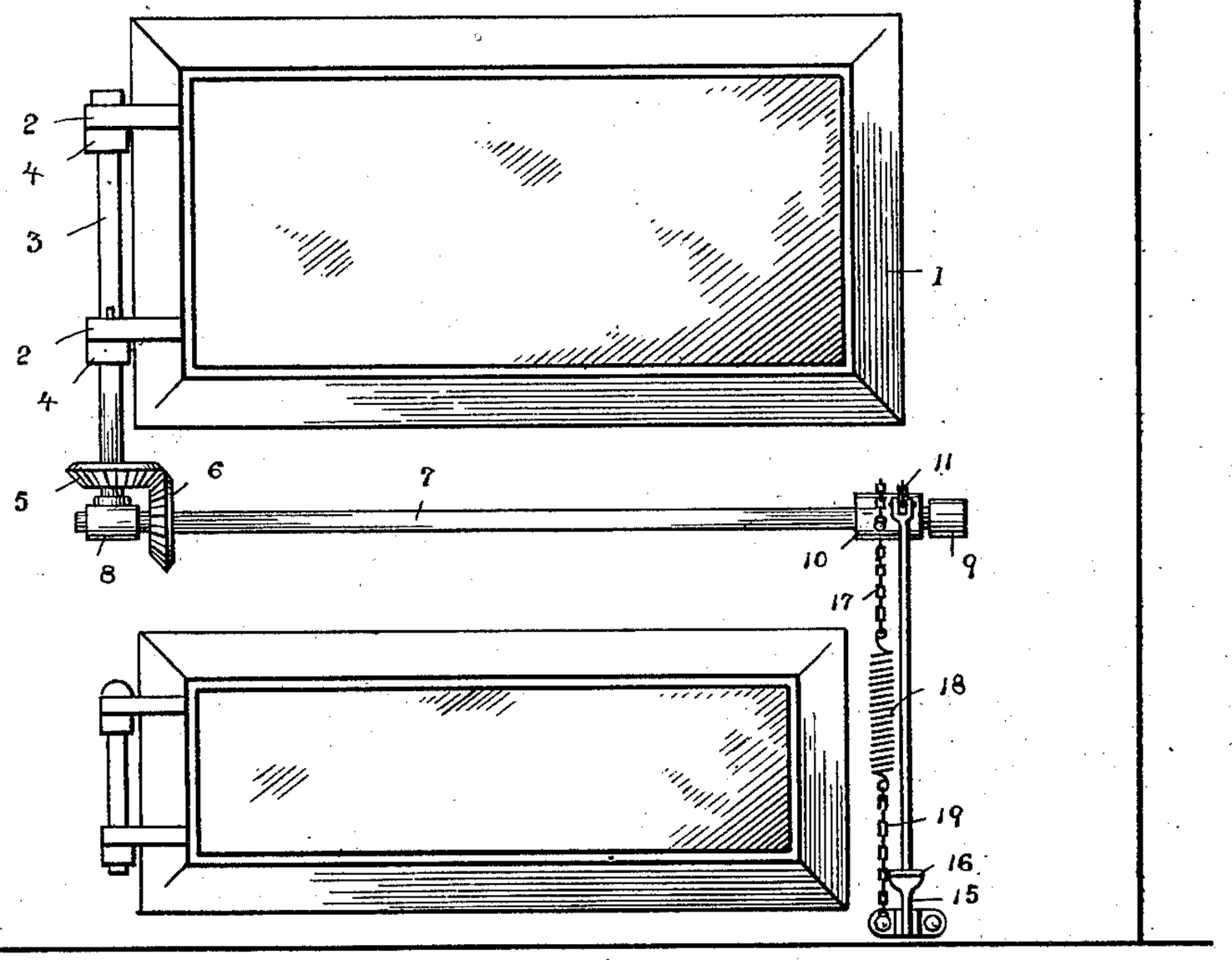

Fig. 2.

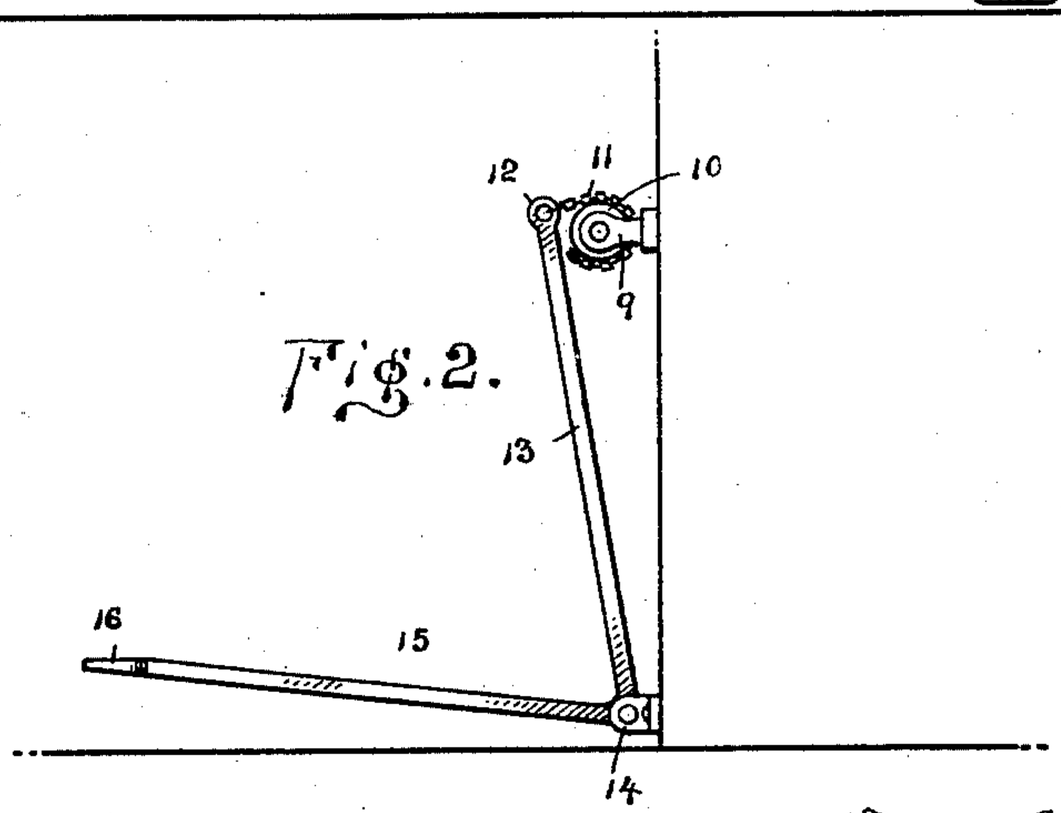

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Fig. 3.

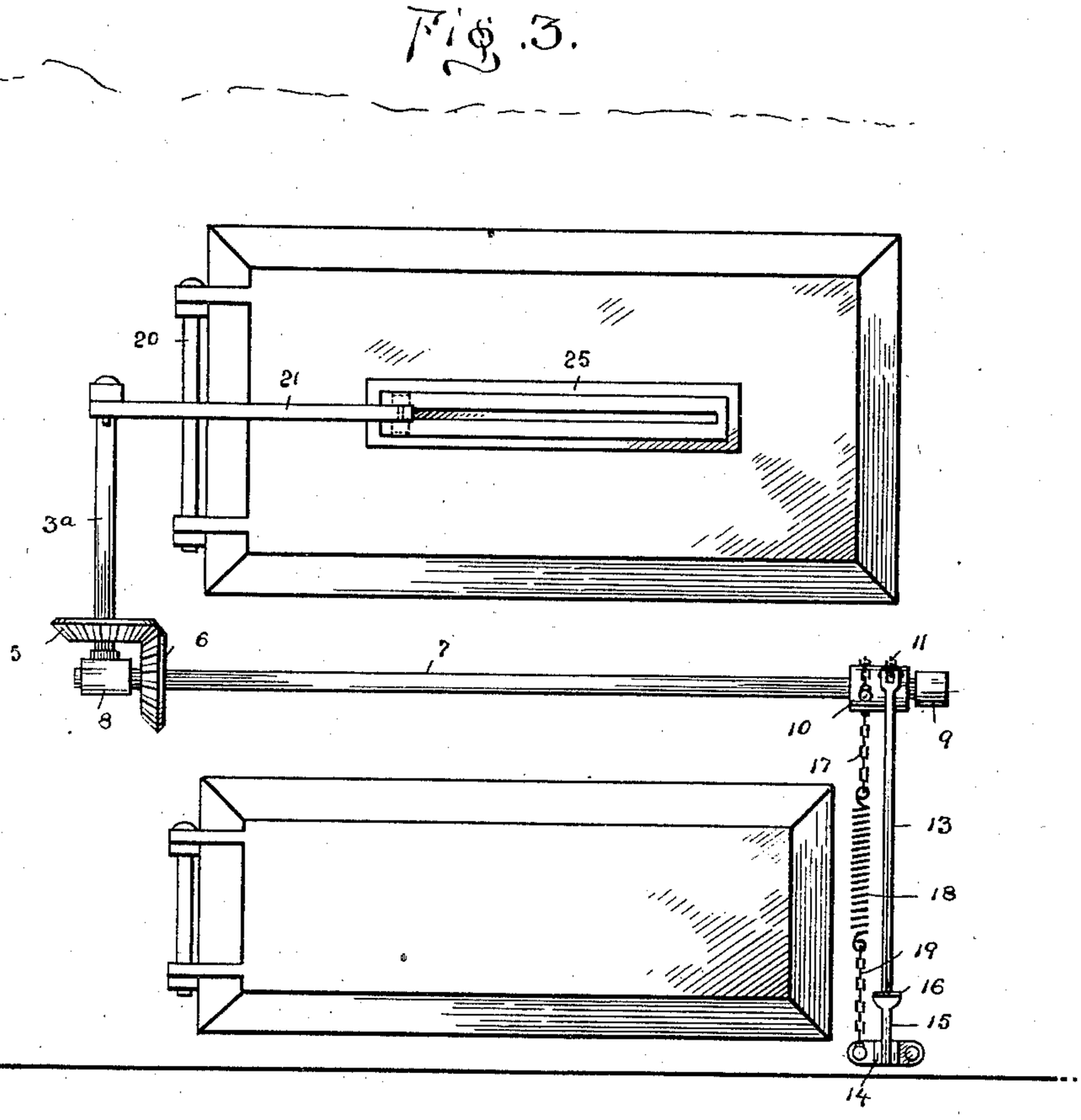


Fig. 4.

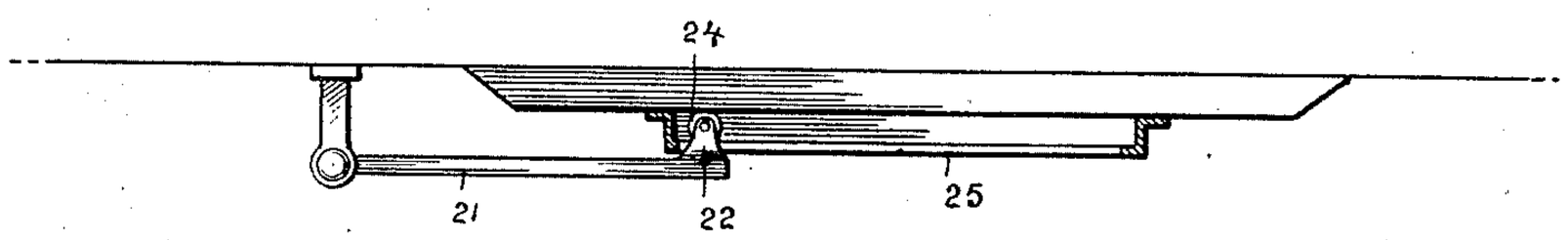
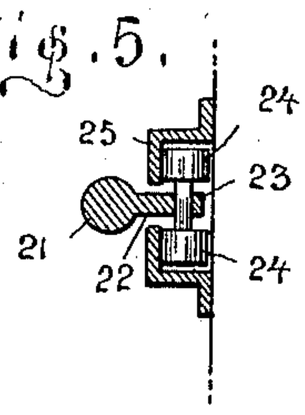


Fig. 5.



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UNITED STATES PATENT OFFICE.

FREDRICK LEO VOEGELEIN, OF FALLS CITY, NEBRASKA.

FURNACE-DOOR-OPERATING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 685,886, dated November 5, 1901.

Application filed April 4, 1901. Serial No. 54,348. (No model.)

To all whom it may concern:

Be it known that I, FREDRICK LEO VOEGELEIN, a citizen of the United States, residing at Falls City, (post-office address Box 245,) in the county of Richardson and State of Nebraska, have invented new and useful Improvements in Furnace-Door-Operating Mechanism, of which the following is a specification.

My invention relates to furnace-door attachments, and more particularly to improved means for opening and closing a furnace-door.

The object of the invention is to provide a furnace-door with novel means for opening the door by pressure upon a treadle and closing the same automatically.

The construction of the improvement will be fully described hereinafter in connection with the accompanying drawings, which form a part of this specification, and its novel features will be defined in the appended claims.

In the drawings, Figure 1 is an elevation of a portion of a furnace-front, showing the fire-door thereof equipped with my improved opening and closing devices. Fig. 2 is a side elevation of the treadle and its connections. Fig. 3 is a front elevation of a furnace-door provided with a modified construction of the opening and closing devices. Fig. 4 is a longitudinal section of the slide shown in Fig. 3, and Fig. 5 is a vertical section through said slide.

Referring to Figs. 1 and 2, the reference-numeral 1 designates the fire-door of a furnace formed with perforated ears 2, through which extends a vertical shaft 3, supported revolubly in bearings 4, projecting from the furnace-front. The ears 2 are keyed to the shaft 3 or rigidly secured thereto in any suitable manner.

Upon the lower end of the shaft 3 is mounted a bevel gear-wheel 5, adapted to mesh with a vertically-disposed bevel-gear 6, mounted near one end of a horizontal shaft 7, supported in bearings 8 and 9, projecting from the furnace-front. Upon the shaft 7, adjacent to the bearing 9, is fixed a drum 10, to which is secured one end of a short chain 11, said chain passing around the drum and being secured at its opposite end to an eye 12, formed at the upper end of a lever 13, fulcrumed upon a bracket 14 near the base of the furnace, as best shown in Fig. 2. The lower end of the lever 13 is formed with an extension 15, terminating at its outer end in a treadle 16. The lever 13 and its extension 15 are arranged at an angle to each other, so that when the treadle is depressed the lever is thrown forward, thus effecting a revolution of the shaft 7 through the medium of the chain 11. This movement of the shaft 7 rotates the vertical shaft 3 through the intermeshing bevel-gears 5 and 6, and the door 1 being fixed to said shaft 7 is thus opened.

17 designates a chain secured at one end to the drum 10 and at its opposite end to the upper end of a coil-spring 18, the lower end of said spring being attached to one end of a chain 19, having its opposite end attached adjacent to the fulcrum-point of the lever and treadle. The chains 11 and 17 are so relatively arranged that one winds upon the drum as the other unwinds, and hence when the chain 11 unwinds by the outward movement of the lever 13 the chain 17 winds upon the drum, thus expanding the spring 18, and as soon as the treadle is relieved of pressure the spring contracts, thus reversing the movement of the shaft 7 and closing the door 1, as will be obvious from the drawings.

The construction shown in Figs. 3, 4, and 5 differs from that above described. In this embodiment of the invention the shaft 7 and its operating lever, treadle, and retracting means are the same as the corresponding parts in Figs. 1 and 2; but instead of securing the door to the vertical shaft 3^a I hinge the door in the usual manner upon a spindle 20 and employ a lever 21, pivotally secured at one end to the upper end of the shaft 3^a, and provided at its opposite end with a bracket 22, within which is supported a vertical shaft 23, having mounted thereon antifriction-rollers 24. These rollers travel within a guide-way 25, extending longitudinally of the door and suitably secured thereto or formed thereon. The operation of this modified construction of the invention is substantially the same as that above explained in connection with Figs. 1 and 2, the only difference being that the door is opened and closed through the medium of the lever 21 instead of directly by the movement of the shaft 3^a.

I claim—

1. The combination with a furnace-door, of means for opening and closing said door, comprising a vertical shaft and a horizontal shaft; connection between the vertical shaft and the door; intermeshing gearing on said shafts; oppositely-disposed chains on said horizontal shaft; a lever and treadle connected to one of said chains, and a retracting-spring connected to the other chain.

2. The combination with a furnace-door, of means for opening and closing said door, comprising a vertical and a horizontal shaft; intermeshing gearing on said shafts; connections between said door and said vertical shaft; a drum on said horizontal shaft; oppositely-disposed chains secured to said drum; a lever provided with a treadle extension and connected to one of said chains; and a retracting-spring connected to the other chain.

3. The combination with a furnace-door, of means for opening and closing said door comprising a vertical shaft to which said door is rigidly secured; a horizontal shaft; intermeshing bevel-gears on said shafts; a drum on the horizontal shaft; oppositely-disposed chains on said drum; a lever connected to one of said chains; a treadle projecting from said lever at an angle thereto; and a retracting-spring connected to the other chain.

4. The combination with a furnace-door, of a revoluble horizontal shaft supported below the door; a bevel gear-wheel adjacent to one end of said shaft; a drum fixed to said shaft near the opposite end thereof; a lever and treadle for revolving said shaft; means for retracting said shaft; a vertical shaft carrying a bevel gear-wheel meshing with the bevel-gear on the horizontal shaft; and connections between said vertical shaft and the door for opening and closing the latter.

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

FREDRICK LEO VOEGELEIN.

Witnesses:
J. R. WILHITE,
A. J. WARD.