

No. 771,670.

PATENTED OCT. 4, 1904.

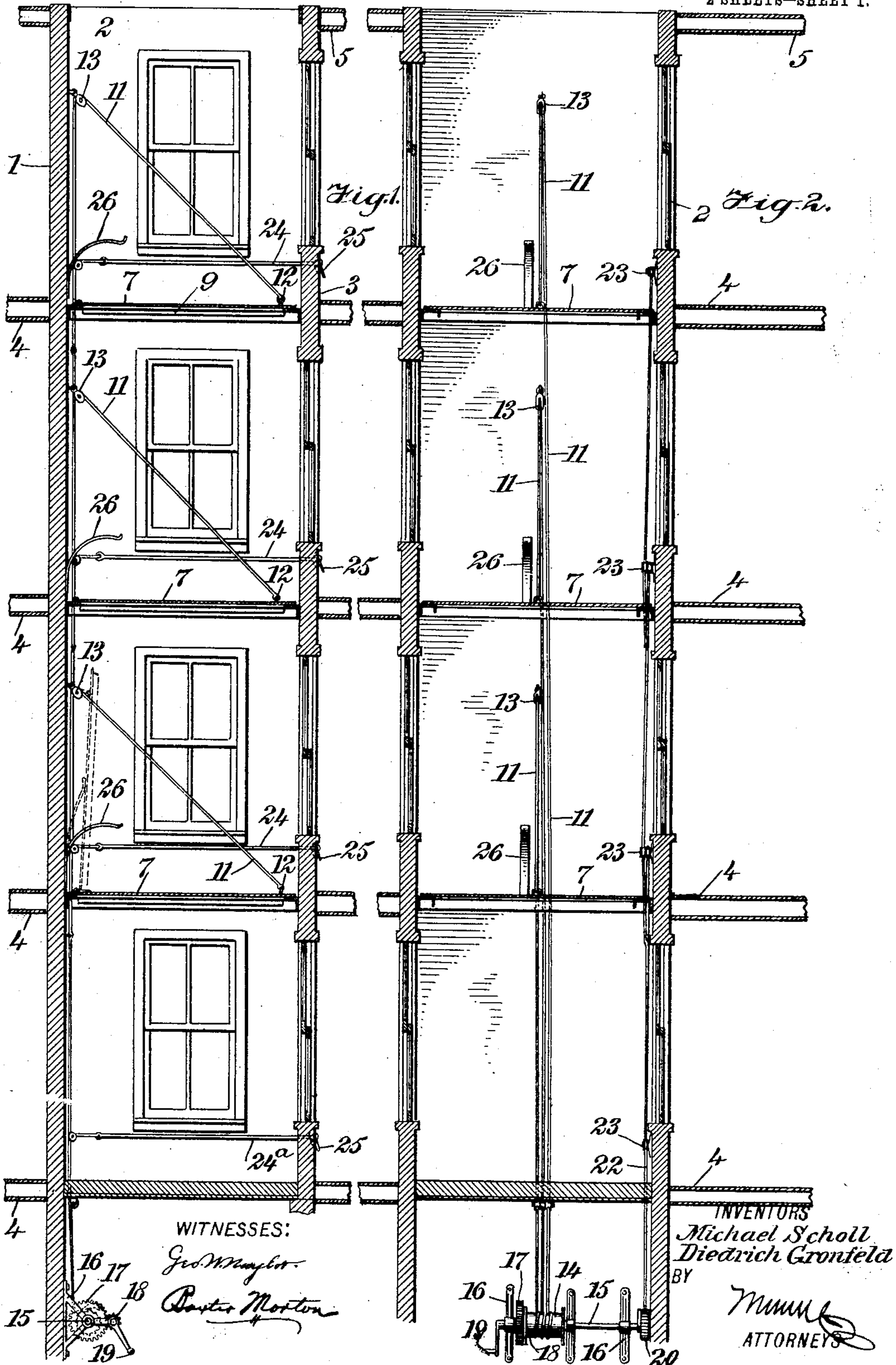
M. SCHOLL & D. GRONFELD.

CLOSURE FOR AIR SHAFTS.

APPLICATION FILED APR. 5, 1904.

NO MODEL.

2 SHEETS—SHEET 1.



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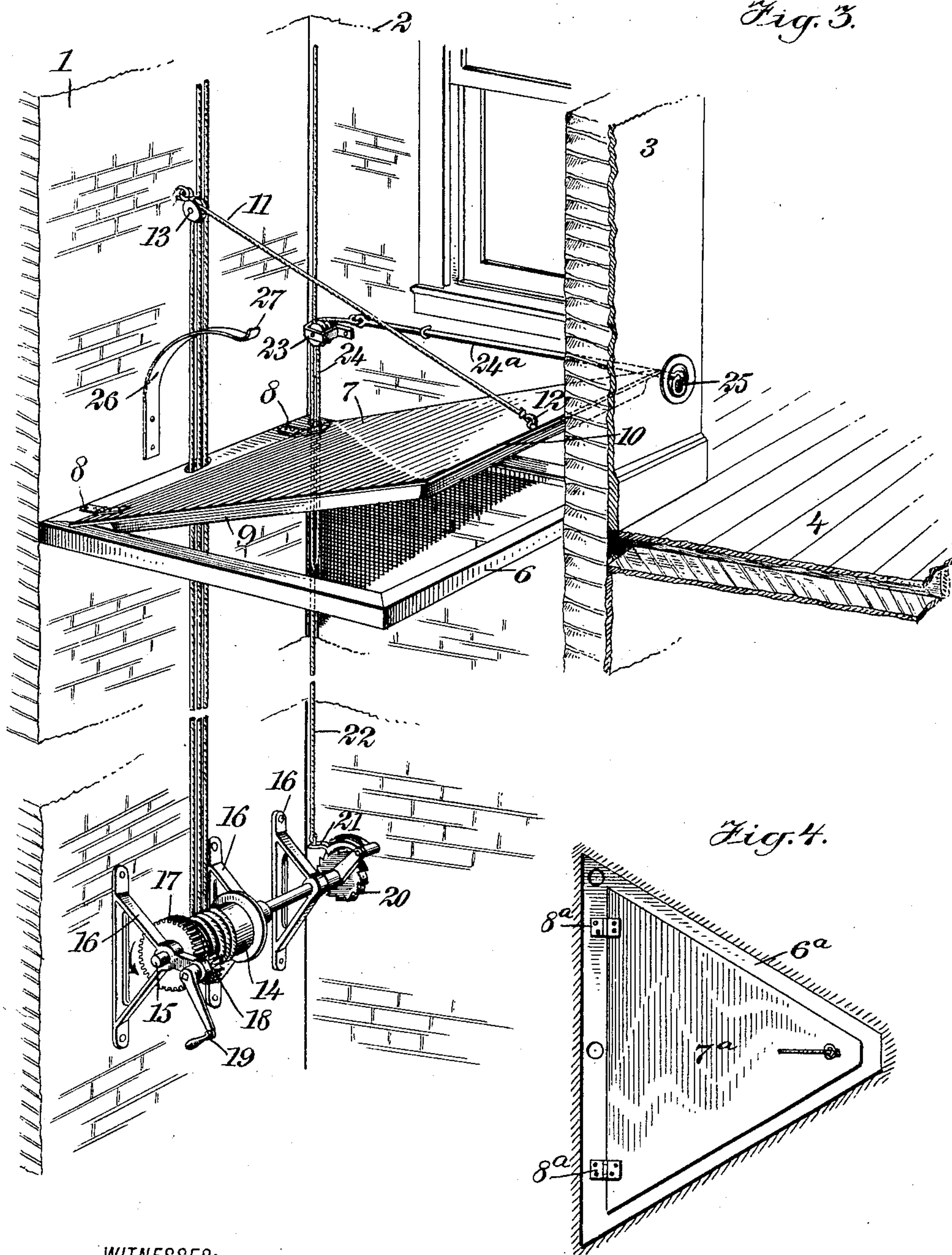
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2 SHEETS—SHEET 2.



WITNESSES:

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UNITED STATES PATENT OFFICE.

MICHAEL SCHOLL AND DIEDRICH GRONFELD, OF NEW YORK, N. Y.

CLOSURE FOR AIR-SHAFTS.

SPECIFICATION forming part of Letters Patent No. 771,670, dated October 4, 1904.

Application filed April 5, 1904. Serial No. 201,627. (No model.)

To all whom it may concern:

Be it known that we, MICHAEL SCHOLL and DIEDRICH GRONFELD, citizens of the United States, and both residents of the city of New York, borough of Brooklyn, in the county of Kings and State of New York, have invented a new and Improved Closure for Air-Shafts, of which the following is a full, clear, and exact description.

This invention relates to automatic closing devices for air-shafts and the like; and the principal object of the invention is to provide an improved apparatus whereby air-shafts in buildings may be automatically divided into sections corresponding to the floors of the building whenever fire enters the air-shaft to any considerable extent.

A further object of the invention is to provide means at each floor in a building for automatically closing the air-shaft at that point whenever fire enters the air-shaft which may be operated manually from any floor in the building when it is so desired.

With the objects above mentioned and others in view, as will hereinafter appear, the invention consists in the novel construction and combination of parts of closures for air-shafts as hereinafter fully described and having the novel features particularly pointed out in the appended claims, it being understood that changes in the minor structure and details may be made within the scope of the claims without departing from the spirit of the invention or sacrificing its advantages.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a vertical sectional view through the air-shaft of a building provided with the improved closures forming the present invention. Fig. 2 is a vertical sectional view upon a plane at right angles to the plane of Fig. 1. Fig. 3 is a perspective view, upon a larger scale, of a portion of the air-shaft, showing the mechanism for operating the closures; and Fig. 4 is a plan view of a closure member adapted for an air-shaft of triangular cross-section.

Referring to the drawings, 1, 2, and 3 represent the walls of an air-shaft, and the floors intersected by the air-shaft are designated 4. The ceiling at the top of the air-shaft is designated 5, and 6 designates frames corresponding in contour to the cross-section of the air-shaft and mounted within the air-shaft to correspond in position to each floor within the building. In most cases the air-shaft is substantially rectangular in shape, and hence this form of air-shaft and frame is illustrated in detail. The frame 6 has a closure 7 hinged thereto at one side by means of hinges 8, as best seen in Fig. 3. The closure 7, which is preferably merely a trap-door, is provided on its under surface with downwardly-disposed ribs or flanges 9, adapted to pass down within the opening of the frame 6 and allow the marginal portion 10 of the closure member 7 to rest upon the upper surface of the frame 6.

In order to raise the several closure members 7 from closed to open position, cords 11 corresponding in number to the closure members are provided, and each cord is preferably attached to the corresponding closure member by means of an eyebolt 12, attached to the closure member at its free margin. The cords 11 pass over sheaves 13, secured to the air-shaft wall in any preferred manner, and thence the cords 11 pass downward through openings in the frames 6 to a reel or drum 14, preferably located within the cellar or basement of the building and mounted upon a shaft 15. The shaft 15 is necessarily rotatably mounted in brackets 16 or their equivalent, and a gear 17 is mounted on the shaft adjacent to one of the ends thereof to mesh with a small pinion 18, supported upon a short shaft journaled in an extension from the bracket 16 adjacent to the gear 17. A crank 19 is provided to impart rotative movement to the shaft upon which the pinion 18 is mounted. When the shaft 15 is rotated in the direction indicated in Fig. 3, the cords 11 are wound upon the drum 14 and the closure members 7 are raised to leave the air-shaft unobstructed. As the closure members rise they contact with the upturned ends 27 of springs 26, mounted upon the wall of the air-shaft in suitable position to engage with the closure members. The continued movement of the closure mem-

bers causes the springs 26 to be distorted from their normal position, and it is necessary to provide some means to hold the closure members in open position, else they will be closed
 5 by the action of the springs 26. The means preferably employed to keep the closure members open consists of a ratchet-wheel 20, mounted on the shaft 15 at the end opposite the gear 17, a pawl 21, normally engaging said
 10 ratchet-wheel, a cord 22, extending upward from said pawl, and a plurality of cords 24 each attached at one end to the cord 22 and passing over a sheave 23 to be connected with an operating-rod 24^a, which extends horizon-
 15 tally and passes through the wall of the air-shaft and presents a ring 25 or other suitable device upon the end thereof to enable the rod to be conveniently manipulated.

From the foregoing description it will be
 20 readily seen that as long as the pawl 21 rests upon the ratchet-wheel 20 any backward rotation of the shaft 15 with the drum mounted thereon will be positively prevented; but if the pawl 21 is lifted out of engagement with
 25 the wheel 20 the elasticity of the springs 26 will at once throw the closure members 7 downward upon the frames 6 and the air-shaft will be closed at intervals by said closure members. It will also be readily seen that inas-
 30 much as each of the operating-rods 24^a is connected by means of a cord 24 with the cord 22, which is attached to the pawl 21, whenever a pull is exerted upon the ring 25 or its equivalent at the end of one of the rods 24^a the pawl
 35 21 will be lifted out of engagement with the ratchet-wheel 20 and the closure members 7 if then raised will be allowed to descend.

In order to provide for the automatic closure of the several closure members when-
 40 ever fire in any considerable amount enters the air-shaft, the cords 11, by which the several closure members are sustained in open or inoperative position, are saturated with oil or some other suitable inflammable liquid which
 45 does not evaporate readily and which will insure the quick ignition of the cords when fire enters the air-shaft. Owing to this saturation of the cords 11 with oil or other inflammable material the entrance of fire in any consider-
 50 able amount into the air-shaft causes the immediate ignition of the cords, which burn rapidly, lose their tensile strength, and allow the several closures to close in a few moments after the fire enters the shaft. The impor-
 55 tance of closing air-shafts in buildings whenever fire breaks out within the building is so well known that extended comment thereon appears unnecessary. As is well known to all persons familiar with the action of fires in
 60 modern buildings, the air-shafts in such buildings act as flues to increase the intensity of the fire by the formation of strong drafts, and this action occurs whenever a fire breaks out upon any floor below the top one. Further-
 65 more, the air-shafts in buildings of fireproof

construction form means whereby the fire may pass from floor to floor, destroying the woodwork and other combustible structures upon the several floors. For both of these reasons it is extremely desirable to provide
 70 means for automatically dividing the air-shafts into sections corresponding to the floors of the building whenever fire enters the air-shaft, as by so doing the effect of the air-shaft in producing a draft is destroyed and the pas-
 75 sage of the fire from one floor to another through the air-shaft is prevented.

In the construction of the closures which form the present invention any suitable material may be employed for the closure mem-
 80 bers themselves; but sheet-iron or sheet-iron protected with asbestos is to be preferred on account of the strength of the structure and the resistance to fire offered thereby.

In Fig. 4 we have illustrated a triangular
 85 closure member 7^a, fitted in the correspondingly-shaped frame 6^a, which corresponds to the cross-sectional contour of a form of air-shaft sometimes seen. In this form of the invention the closure member is attached to
 90 the frame by hinges 8^a.

Two forms of closure members are illustrated and described merely to show that the invention is readily adaptable to air-shafts of
 95 different cross-sectional forms, and we do not wish to be understood as limiting ourselves to closure members of any particular contour.

Having thus described our invention, we claim as new and desire to secure by Letters
 100 Patent—

1. The combination with an air-shaft, of a plurality of hinged closure members arranged at intervals throughout the length of the shaft, curved springs secured to and projecting from
 105 the wall of the air-shaft at the hinged ends of the closure members and with which the said members engage when opened, cords attached to the free edges of the closure members, a reel upon which the cords are wound, a
 110 gear-wheel on one end of the reel-shaft, a shaft, a pinion on the shaft and meshing with the gear-wheel, a crank-handle on said shaft, a ratchet-wheel on the other end of the shaft of the reel, a pawl engaging the ratchet-wheel,
 115 a cord secured to the pawl, a plurality of cords secured to the first-named cord, and a plurality of sliding rods, to each of which one of the said cords is secured, substantially as here-
 in shown and described.

2. The combination with an air-shaft, of a
 120 plurality of hinged closure members arranged at intervals throughout the length of the shaft, springs secured to the wall of the air-shaft at the hinged end of the closure members and with which the said members engage when
 125 opened, cords attached to the free edges of the closure members, a reel upon which the cords are wound, means for operating the reel, a ratchet-wheel on one end of the reel-shaft, a pawl engaging the ratchet-wheel, a plurality
 130

of cords connected with the pawl, and sliding rods to each of which one of the said cords is secured, substantially as described.

3. The combination with an air-shaft, of a
5 plurality of closure members arranged at intervals throughout the length of the shaft, cords engaged one with each of said closure members to throw the same into open position, a reel upon which said cords are wound,
10 a pawl and ratchet associated with said reel to prevent unwinding thereof, and independently-operable means arranged at intervals

throughout the length of the air-shaft for disengaging said pawl and ratchet, said means comprising a sliding rod and a flexible connection between the rod and pawl. 15

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

MICHAEL SCHOLL.
DIEDRICH GRONFELD.

Witnesses:

JNO. M. RITTER,
BAXTER MORTON.