

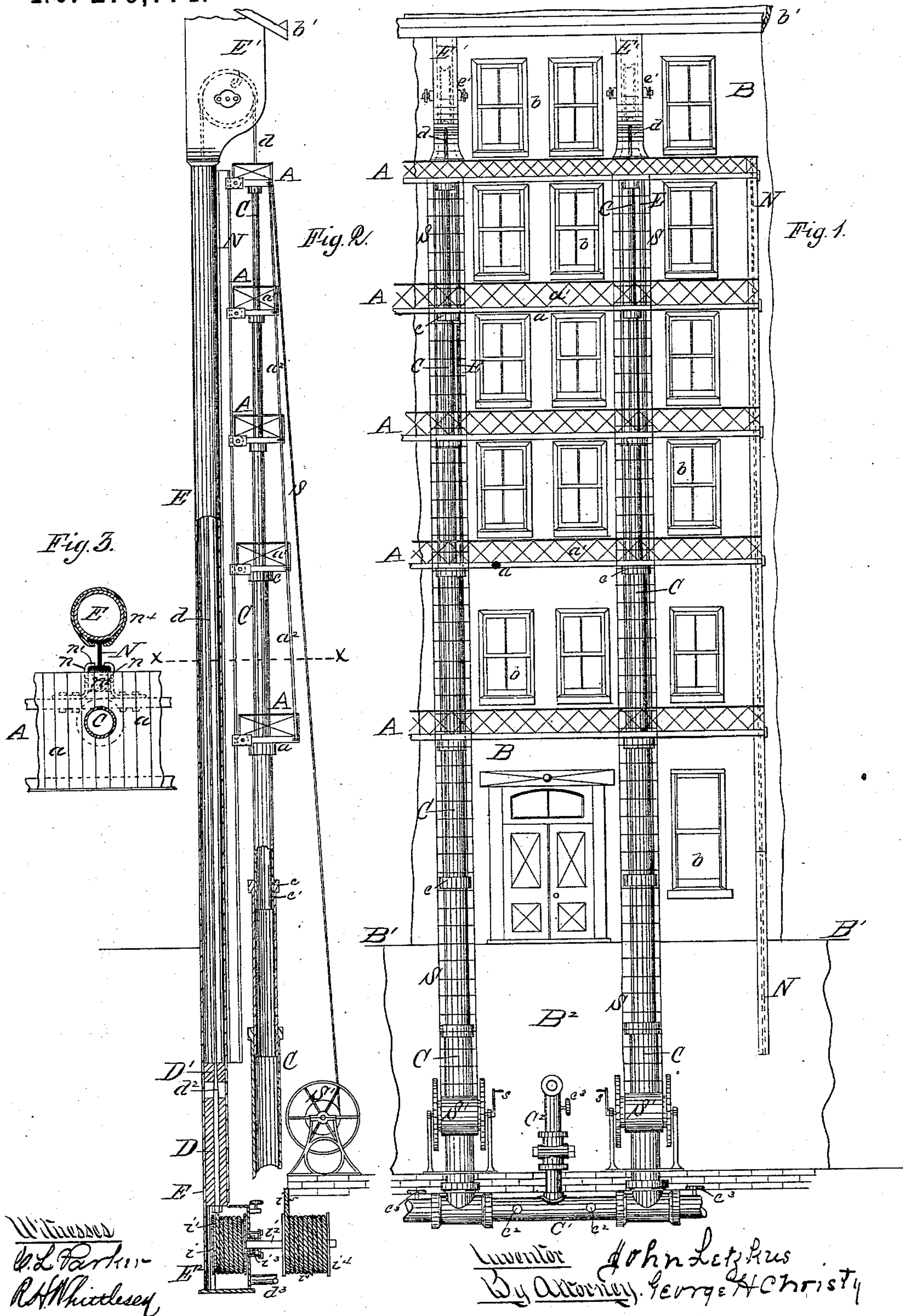
(No Model.)

2 Sheets—Sheet 1.

J. LETZKUS.
FIRE ESCAPE.

No. 279,774.

Patented June 19, 1883.



(No Model.)

2 Sheets—Sheet 2.

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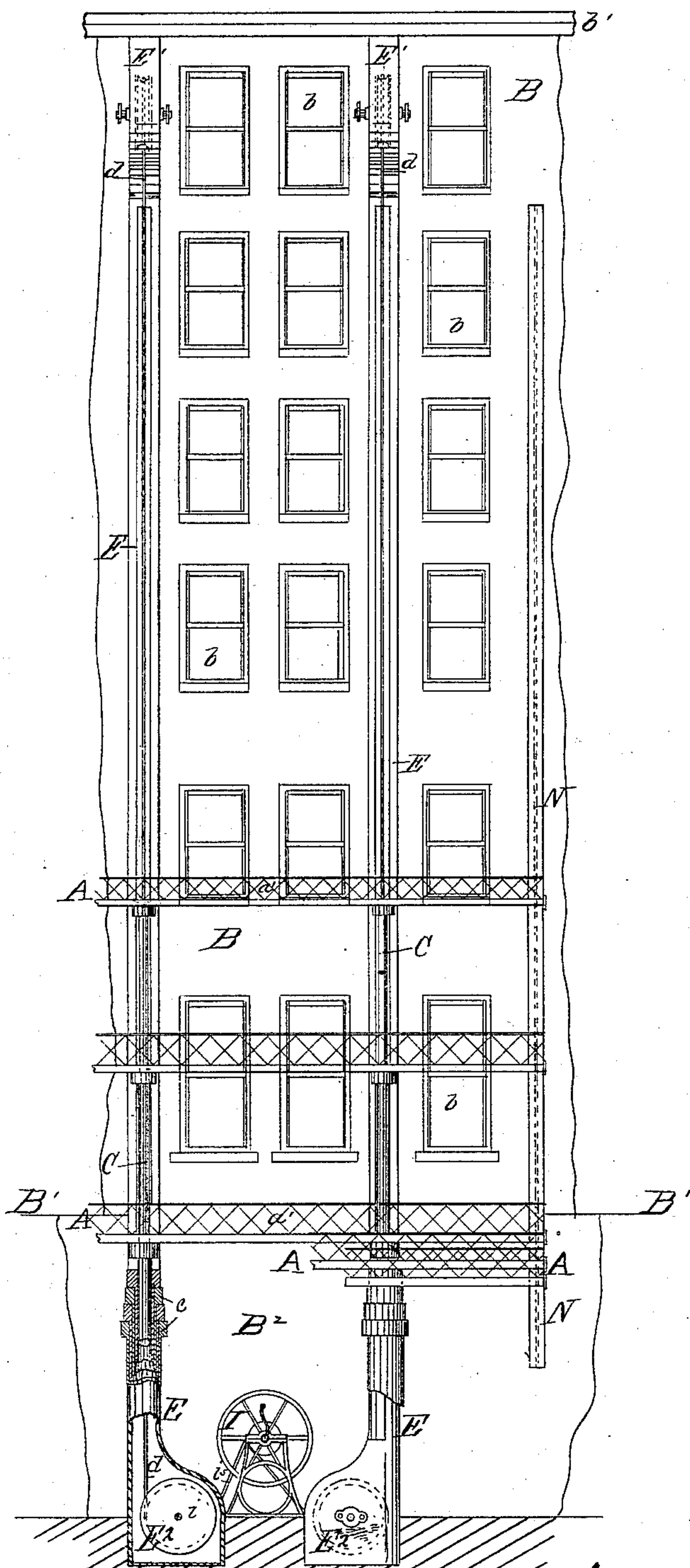


Fig. A.

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UNITED STATES PATENT OFFICE.

JOHN LETZKUS, OF ALLEGHENY, PENNSYLVANIA.

FIRE-ESCAPE.

SPECIFICATION forming part of Letters Patent No. 279,774, dated June 19, 1883.

Application filed February 17, 1883. (No model.)

To all whom it may concern:

Be it known that I, JOHN LETZKUS, a citizen of the United States, residing at Allegheny City, county of Allegheny, State of Pennsylvania, have invented or discovered a new and useful Improvement in Fire-Escapes; and I do hereby declare the following to be a full, clear, concise, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—like letters indicating like parts—

Figure 1, Sheet 1, is a front elevation of a section of a building and of my improved fire-escape. Fig. 2 shows an end elevation, partly in section, of the fire-escape. Fig. 3 is a horizontal sectional view of a portion of the apparatus, taken in the plane of the line xx , Fig. 2; and Fig. 4, Sheet 2, is a view similar to Fig. 1, but showing the balconies partly lowered, and also showing a portion of the sustaining pipes or columns broken away in order to expose the foot of the balance-pipes and mechanism connected therewith.

My invention relates to certain improvements in fire-escapes; and, in general terms, it consists of certain combinations of vertically-movable balconies, columns of telescoping pipes, with water-supply therein, for supporting the balconies and graduating their descent, counter-weights inclosed within pipes for balancing the weight of the balconies, guides for directing the movement of the balconies, mechanism for creating a vacuum in the balance-pipes or for supplying water thereto for operating the balconies with or without water-pressure, and means for storing the balconies within a chamber beneath the pavement when not in use, as hereinafter more fully described and claimed.

In the drawings, A A represent a series of light balconies, constructed of wood or iron, preferably iron, having a floor, a , and guard-railing a' , of lattice-work or equivalent light frame-work. These balconies decrease in width in regular succession upward, (see Fig. 2,) so that when lowered they may "nest" together, as shown at the bottom of Fig. 4. They are connected together at their ends and also at any desired intermediate points by stay-ropes a^2 , made by preference of wire cord or light chains. The floors of the balconies rest upon

and are supported by the head collars c of a series of telescoping pipes C. The length of successive joints of this pipe is graded corresponding to the height of successive stories of the building B, so that when extended, as in Figs. 1 and 2, the several balconies may be a little below or within easy reach of the windows b . The upper pipe-section C of the columns is closed at its upper end, its lower end and both ends of the remaining sections being open. The several sections fit together end within end, as at c' , where any suitable form of packing may be inserted between the pipe-surfaces to prevent leakage. If water under pressure be let into the column thus made, the upper section, with the upper balcony, will be raised, bringing the cords a^2 between the upper and next lower balcony taut. Continued water supply and pressure will then raise both balconies, then the third, and so on in order till all are raised, as in Figs. 1 and 2. Water is supplied at the lower ends of these telescoping columns by a trunk-pipe, C', which may connect through branch C² with a pumping-engine of the fire-service, and also by its end or by other suitable branches with a stationary pumping-engine, or with the water-mains or any other suitable water-supply. This trunk C' and also the lower sections of the columns C are located beneath the pavement or ground-line B', at the side of the building, an excavation, B², being made for this purpose of sufficient size to receive all of the balconies beneath the pavement when not in use; or, if desired, some one of the balconies may be left at the pavement and one or more others above, as in Fig. 4, which illustrates the series partly lowered within the receiving-chamber B². If all the balconies are lowered into this chamber, as ordinarily contemplated, the opening into it may be covered over with any suitable form of trap-doors.

The telescoping columns C may be used, also, to retard or regulate the descent of the loaded balconies by a gradual discharge of water therefrom—for example, through the ports c^2 , which may be provided with any known suitable form of valve for closing and graduating the area of port-opening—the supply being cut off when the columns are so emptied by suitable valves, c^3 .

In order to assist in moving the balconies, I make use of weights D, (see Fig. 2,) by preference, one for each column C, which weights are suspended by wire cords d over pulleys e' from the upper balcony or the upper end of the pipe-sections which carry such balcony. These weights D are inclosed within pipes E, which are securely fastened to the building in vertical position, and by preference in the vertical planes of the pipe-columns C. They are extended from the bottom of chamber B² upward a sufficient height to afford a tubular passage for the weights equal in length to the full range of movement of the upper balcony. On the upper ends of these pipes are boxes E', in which are mounted the pulleys e' , over which the cords d pass. These boxes E' may be under the eaves b' of the building, and, in effect, form a part of its cornice.

The weights D are fitted to move within the pipes sufficiently close to be lifted like pistons by fluid-pressure below, and to this end they may, if desired, be packed to prevent leakage by any of the well-known forms of piston-packing.

In order to prevent downward flow of air past the weights, with reference to forming a vacuum or partial vacuum below as the weights are raised, rubber or other equivalent packers, D', are employed, which are supported on wedge or conical pointed rods d'' , which latter pass through the packers, and thus carry them. Upward lift will thus expand the packers against the inner wall of the pipes, thereby preventing passage of air. On lowering the weights, however, the pressure of the packers will be released.

In practice I make the combined weight of the counter-weights D about equal to the weight of all the balconies and the mechanism movable therewith, so that the balconies will be suspended or balanced by the counter-weights in the position shown in Figs. 1 and 2. On lowering the balconies the weight of one after another will be taken off by depositing in the chamber B²; and in order to cause the weights to rise under such diminished load, and thereby permit the remaining balconies to come down, water may be forced into the pipes E below the weights through valve-governed branch pipes d^3 , which connect with the trunk C', or with other suitable water supply under pressure.

By shutting off fluid-supply, air, and water through pipes d^3 or air-cocks d^4 , raising the weights will tend to create a vacuum below them, the pipes being made tight for this purpose, thereby supplementing the sustaining force of the weights by air-pressure upon their upper ends. Thus pressure may be made upon the weights within the pipes by water below or by air above to diminish or increase their effective force upon the suspended balconies, thereby regulating such force to the load to be moved by the balconies.

On the lower ends of pipes E are secured

boxes E², made air-tight, as above described, for the pipes, and within these boxes are mounted rotary drums i , on which are wound wire cords or chains i' , attached to the lower ends of weights D. The shafts i^2 of these drums pass outward through stuffing-boxes i^3 . Rotary motion may be given to the drums by cranks applied to these shafts or in other suitable way, thereby winding the cords thereon and drawing down the weights and raising the balconies in case they stick or refuse to start readily.

In case it is desired to draw downward upon two or more of the weights at one time, it may be done by securing drums i^4 on the extended ends of shafts i^2 and passing cords i^5 from them to windlass I, as illustrated in Fig. 4, the cords i^5 being wound on their drums i^4 in counter direction to the winding of cords i' .

In order to direct the movements of the balconies and hold them to the wall, flanged guide-rails N, of I-beam form, are bolted, strapped, or otherwise secured to the pipes E, (see Figs. 2 and 3,) and bent plates n are secured to the floors a in position for their bent ends n' to bear against the inner face of the rail-flanges. Also, rollers n^2 may be mounted between or on the plates n in position to hear against the outer face of the guide-rails.

In order to provide for ready ascent to and descent from the balconies in case of need, and also to assist in drawing down the upper balconies, wire-rope ladders S are carried from reels S' to the upper balcony and there secured, their inclination being such as to cause them to clear, but still be within easy reach of, the several balconies below. As the balconies are raised these ladder will be unreel and carried up; or, on the other hand, by turning the cranks s the upper balcony, or any and all others with which the ladders may be connected, will be drawn down. Occasion for such use of the ladders may arise in case of failure of water-supply sufficient to raise the weights D within the pipes E, as above described.

It will be observed that provision is made in this construction for operating the balconies in either and both directions, either with or without water, so that in case water fails the apparatus will not be rendered useless. For example, the force of gravity on the weights D, combined with downward pull imparted by winding cords i' on drums i , will raise the balconies, with or without water-pressure in the telescoping pipes C. Also, the descent of the balconies may be regulated under a load by the provision made for forming a vacuum below the weights in the balance-pipes E, either with or without the presence of water in the telescoping columns for a retarding medium. Also, in case the load on the upper balcony is not sufficient to overbalance the weights, it may be brought down by winding the ladders S on the rails S', either with or without water-pressure in the balance-pipes below the weights. This provision for operating the

apparatus either with or without water-pressure is made in part with reference to possible failure of water-supply at the time of need, but more especially because the combinations of devices for manipulating the balconies, co-operating as above described, render the apparatus more efficient and better adapted to meet emergencies that may arise.

In the drawings I have shown only a section or part of a building and corresponding section or part of my improved fire-escape. In practice the parts of this apparatus may be duplicated or multiplied to any desired number and extent, thereby adapting it to the whole or to a part of the side of the building, or to buildings of different heights and positions. For example, I consider it as coming within my invention to employ one or more movable balconies supported on one or more telescoping columns, and counterbalanced by one or more weights inclosed within pipes, with provision for forcing water into such columns and pipes, and, if desired, for creating a vacuum in the pipes below the weights; also, for storing such balconies away beneath the pavement when out of use. If desired, the apparatus may be made to reach but part of the length of the side of the building—say on either side of the main entrance, so that it may be operated without obstructing such entrance.

Instead of placing the balance-pipes E directly back of the columns C, they may be placed at the side, or two of such balance-pipes may be placed, one at either end of the balconies, with cords from such pipes to the columns running over pulleys along the side of the building, and in such case the guide-rails N may be fastened direct to the building.

I claim herein as my invention—

1. In a fire-escape apparatus, the combination of one or more vertically-movable balconies, A, one or more supporting-columns, C, of telescoping pipes, a water-supply to such columns, balance-pipes E, counter-weights D, inclosed within the balance-pipes, cords d , and pulleys e' , substantially as set forth.

2. The combination of one or more balconies, A, one or more supporting-columns, C, of telescoping pipes, a water-supply to such columns, guides N n , one or more balance-

pipes, E, inclosed weights D, cords d , pulleys e' , and packers D', the balance-pipes being closed below the weights to exclude air, substantially as and for the purposes set forth.

3. The combination of one or more vertically-movable balconies, A, guides N n , columns C, balance-pipes E, weights D, cords d , pulleys e' , cords i' , and drums i , substantially as and for the purposes set forth.

4. The combination of two or more vertically-movable balconies, A, connecting-cords a^2 , one or more supporting-columns, C, of telescoping pipes, a water-supply to such columns, balance-pipes E, inclosed weights D, cords d , pulleys e' , and a water-supply to the balance-pipes below the inclosed weights, substantially as and for the purposes set forth.

5. In combination with a building having an excavated chamber at its side beneath the pavement or ground-level, one or more balance-pipes, E, secured to the wall of the building, one or more columns of telescoping pipes, C, the lower pipe-sections being seated within the chamber, a water-supply to such columns, one or more balconies, A, supported on the columns, counter-weights D, inclosed within the balance-pipes, cords d , and pulleys e' , substantially as set forth.

6. The combination of one or more balconies, A, one or more supporting-columns, C, of telescoping pipes, balance-pipes E, weights D, packers D', pointed lifting-rods or expanders d^2 , cords d , pulleys e' , and a valve-governed air-inlet to the balance-pipes below the weights, substantially as set forth.

7. The combination of a series of two or more balconies, A, supporting-columns C of telescoping pipes, a water-supply to such columns, guides N n , ladder S, reel S', balance-pipes E, weights D, cords d , pulleys e' , packers D', cords i' , drums i , and valve-governed air and water supplies to the balance-pipes below the weights, substantially as and for the purposes set forth.

In testimony whereof I have hereunto set my hand.

JOHN LETZKUS.

Witnesses:

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R. H. WHITTLESEY.