

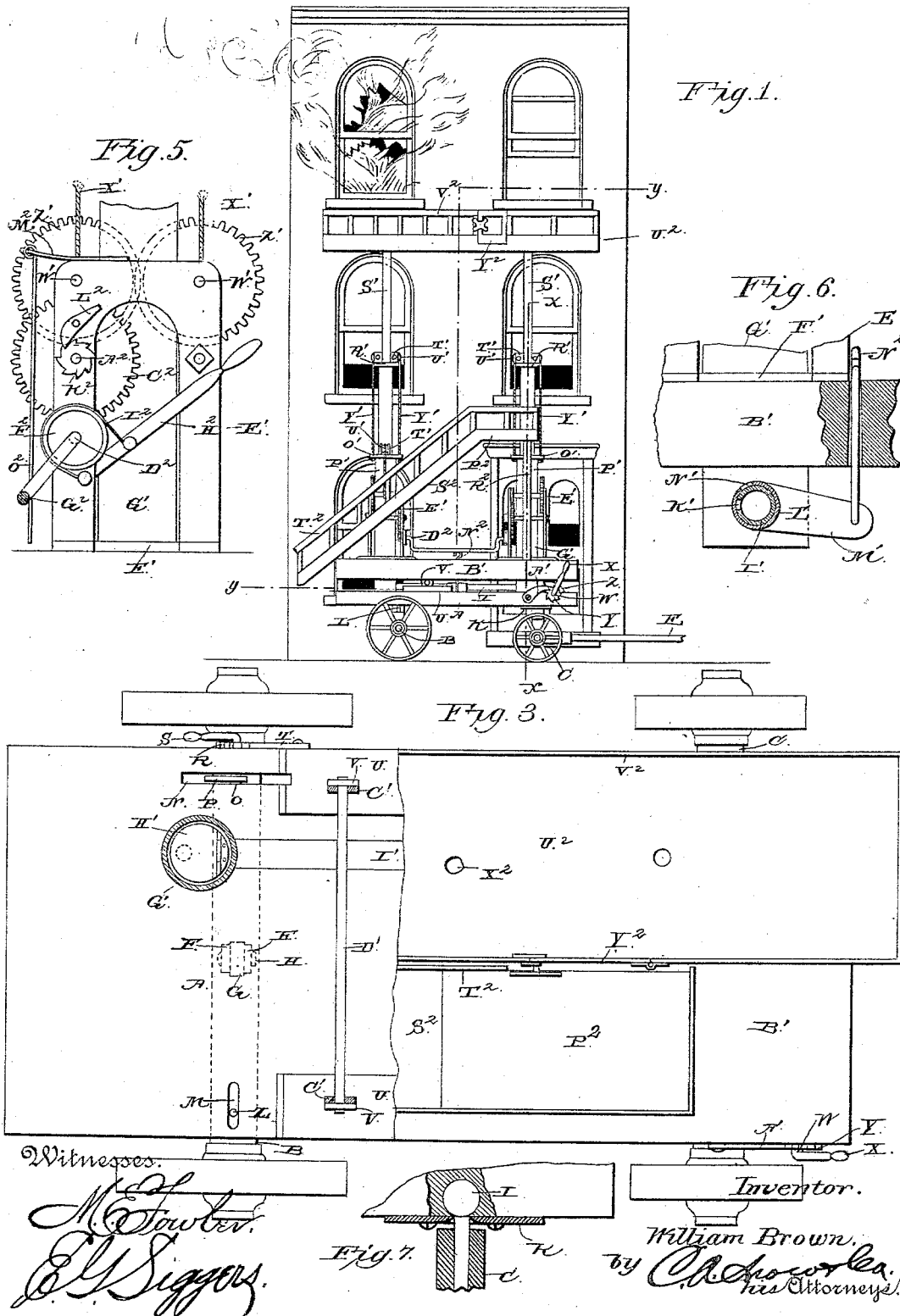
(No Model.)

2 Sheets—Sheet 1.

W. BROWN.
PORTABLE FIRE ESCAPE.

No. 381,672.

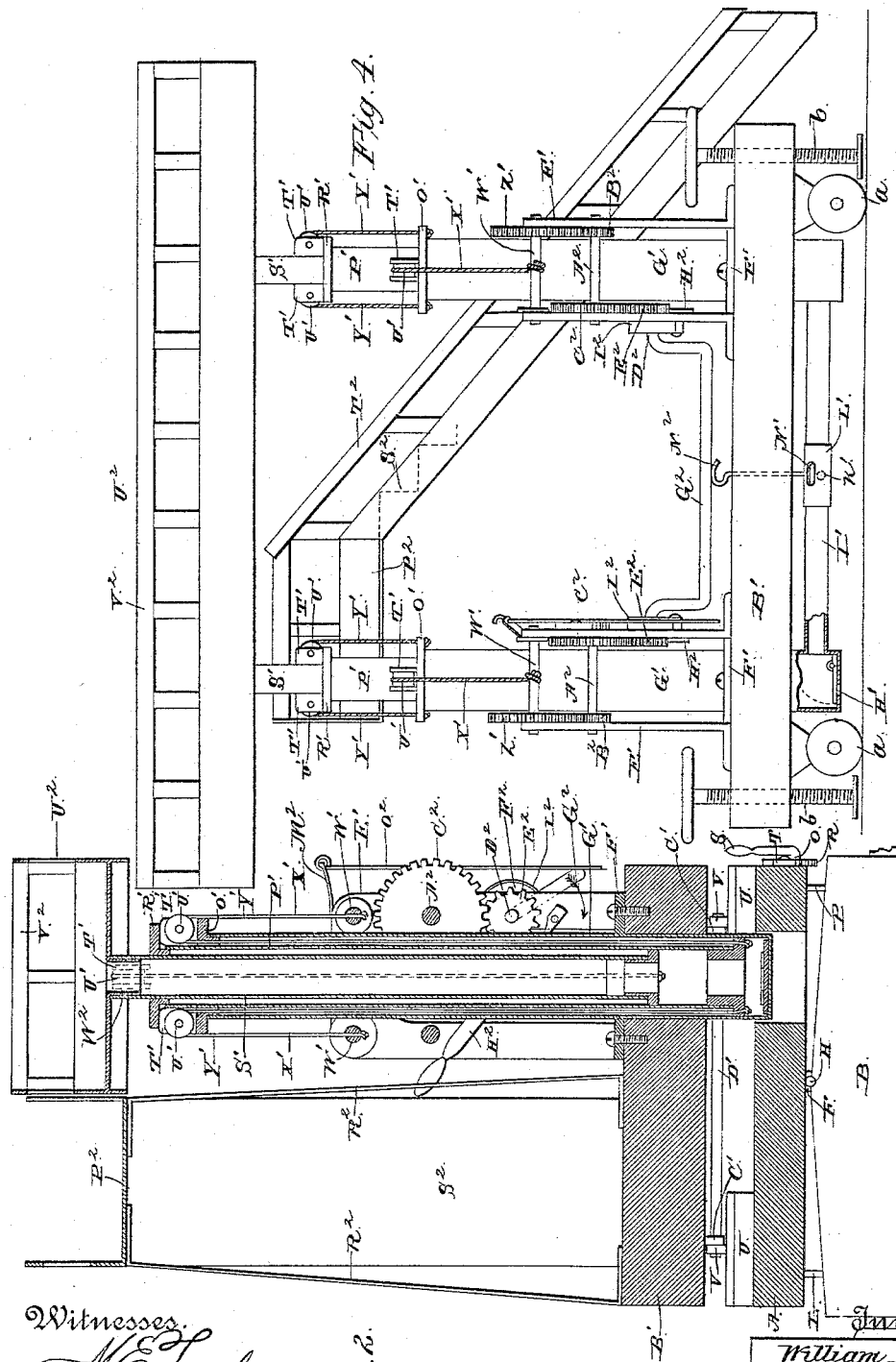
Patented Apr. 24, 1888.



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Witnesses.
M. E. Lowder.
E. S. Siggers

Fig. 2.

Inventor.
William Brown.
by *C. H. Hawley*
his Attorney.

UNITED STATES PATENT OFFICE.

WILLIAM BROWN, OF DUNCANNON, ASSIGNOR OF ONE-HALF TO HENRY
WILSON SHEIBLEY, OF PHILADELPHIA, PENNSYLVANIA.

PORTABLE FIRE-ESCAPE.

SPECIFICATION forming part of Letters Patent No. 381,672, dated April 24, 1888.

Application filed September 2, 1887. Serial No. 248,607. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM BROWN, a citizen of the United States, residing at Duncannon, in the county of Perry and State of Pennsylvania, have invented a new and useful Improvement in Portable Fire-Escapes, of which the following is a specification.

My invention relates to an improvement in portable fire-escapes; and it consists in the peculiar construction and combination of devices, that will be more fully set forth hereinafter, and particularly pointed out in the claims.

This invention is an improvement on the fire-escape for which Letters Patent of the United States No. 335,108 were granted to me February 2, 1886.

In the accompanying drawings, Figure 1 is a side elevation of a fire-escape embodying my improvements, parts being broken away to disclose interior mechanism. Fig. 2 is a vertical transverse sectional view taken on the line *xx* of Fig. 1. Fig. 3 is partly a top plan view and partly a horizontal section taken on the line *yy* of Fig. 1. Fig. 4 is a side elevation of a modified form of my invention. Figs. 5, 6, and 7 are detail views of parts of my invention.

A represents a supporting frame or platform, which is mounted upon a rear axle, B, and a front axle, C, the said axles being provided with supporting wheels, and the front axle being pivoted to the frame or platform by means of a king-bolt in the usual manner, and thereby adapted to turn. A pole or tongue, E, is secured to the front axle and serves for the attachment of the draft-animals. The upper edge of the rear axle is inclined downward from its center in opposite directions, and on the center of the said axle are secured a pair of ears or keepers, F, provided with central aligned openings. From the lower side of the frame or platform A, in the center thereof and at a suitable distance from its rear end, depends a similar ear or keeper, G, which enters the space between the ears F. A pivotal bolt, H, is then inserted through the aligned openings in the ears F and G and serves to pivot the rear portion of

the frame or platform onto the inclined upper edge of the rear axle, so that the said platform may be tilted thereon, as will be readily understood.

The upper end of the king bolt, which connects the front axle to the front portion of the frame or platform, has a ball, I, which fits in a socket or opening in the lower side of the frame or platform. A circular metallic plate, K, is secured to the under side of the platform near its front end, and is provided with a central opening, through which the upper portion of the king bolt extends. By thus connecting the king bolt to the platform by the ball and socket the platform is adapted to tilt or incline in either direction over the front axle, the latter having its upper edge inclined downward in opposite direction from its center in a similar manner to the rear axle, so as to permit the platform to tilt or incline thereon.

L represents a guide-rod, which projects from the upper side of the rear axle near one end thereof, and extends through a vertical transverse slot, M, that is made in one side of the platform A. In the opposite side of the said platform is made a vertical longitudinal slot, N, of suitable length.

O represents a rock-shaft, which is journaled in suitable bearings on the under side of the platform A, the said rock-shaft extending across the center of the slot N.

P represents a cam, which is attached to the center of the said rock-shaft, works in the slot N, and is adapted to be turned down upon the upper side of the rear axle. Near the outer end of the rock-shaft is a ratchet wheel, R, and at the extreme outer end of the said shaft is a lever-rod, S, by means of which the rock-shaft and the cam may be turned. A detent, T, is pivoted to one side of the platform, and is adapted to engage the ratchet-wheel R, so as to secure the rock-shaft at any desired position. When the rock-shaft is turned so as to cause the cam to engage the upper side of the rear axle, the platform is tilted or inclined on the said axle, as will be readily understood. This enables the platform to be arranged laterally in a horizontal plane, when the support-

ing-trucks thereof are standing on uneven ground, for the purpose to be hereinafter more fully described.

On the upper side of the platform A, at opposite edges thereof and at a suitable distance from its rear ends, are a pair of aligned blocks, U, which are provided on their upper sides with vertical ears or keepers V.

W represents a rock-shaft, which is journaled in transverse bearings on the upper side of the platform, near the front end thereof. This rock-shaft is provided at one end with a lever-arm, X, whereby it may be turned, and with a ratchet-wheel, Y, and is further provided near its extremities with a pair of eccentric cam-arms, Z, which work in vertical longitudinal slots in the platform.

A' represents a gravity pawl or detent, which is pivoted to one side of the platform A, and is adapted to engage the ratchet-wheel Y, so as to lock the rock-shaft in any desired position.

B' represents a supporting-base, which is provided on its under side, at a suitable distance from its rear ends, with depending ears or keepers C', which align with the ears or keepers U of the platform A. A pivotal bolt, B', is then inserted transversely through the aligned openings in the keepers U and C', thereby serving to hinge or pivot the supporting-base upon the platform A, and thus permit the said supporting-base to be tilted or inclined in a longitudinal direction upon the said platform. The front end of the supporting-base bears upon the cam-arms of the rock-shaft W, and by turning the said rock-shaft so as to move the said cam-arms the front ends of the supporting-base may be raised or lowered as may be necessary to adjust the said supporting-base to a horizontal position when the machine is standing on uneven ground. Inasmuch as the platform A may be tilted laterally, and inasmuch as the base B' is hinged to the said platform and is adapted to be tilted longitudinally, it follows that the said base is given a universal movement, and may be readily arranged in a horizontal position, no matter what the nature of the ground may be on which the machine is standing.

E' represents a pair of vertical metal frames, which are secured to one side of the supporting-base, near the front and rear ends thereof. Between the sides of each frame E' is secured a base-plate, F', which is bolted to the supporting-base B'.

G' represents a pair of vertical cylindrical tubes of suitable length and diameter, which are attached to the base-plates F' and extend through central openings in the said base-plates. The lower portions of these tubes G' extend downward below the base-plates F', through openings in the base B', and enter vertical aligned openings in the platform A. The upper portions of the said tubes G' project vertically above the base B' to a suitable height. In the lower ends of the tubes G' are valves H', which are adapted to open up-

wardly when subjected to pressure from below, but will close firmly in their seats when subjected to pressure from above.

I' represents a longitudinal tube, which communicates with the lower portions of the tubes G' below the base B'. In the center of this tube is an outlet-opening, K'.

L' represents a sleeve, which is fitted snugly on the central portion of the tube I', has an arm, M', extending from one side, and is provided with an opening, N', adapted to register with the opening K' when the sleeve is turned in one direction on the tubes, so as to uncover the said opening. When the sleeve is turned in the contrary direction, it closes the opening K', as will be readily understood, and thereby cuts off the pipe I' from communication with the outer air. A rod passes through a vertical opening near the central portion of the base B', and has its lower end connected to the arm M' of the sleeve. By means of this rod the sleeve may be turned so as to open or close the opening K' by a person standing upon the base B'.

To the upper ends of the tubes G' are secured flanged rings O' by means of pins or screws. These flanged rings form bearings and guides for tubes P', which are fitted into the tubes G', and are adapted to be extended therefrom. On the upper ends of the tube P' are fitted flanged rings R', which serve as guides and bearings for still smaller tubes, S', which are arranged in the tubes P', and are adapted to be extended therefrom telescopically.

The lower ends of the tubes P' are provided with packings, which fit snugly in the inner sides of the tubes G', and the lower ends of the tube S' are closed to form pistons, and are provided with packings that fit snugly in the tubes P'.

The rings O' and R' are provided on opposite sides with pairs of ears T', between which are journaled sheaves U'.

W' represents shafts which are journaled in the upper ends of the frames E' on opposite sides of the tubes G'. The intermediate portions of the said shafts between the sides of the frame are enlarged to form drums, to which are connected the ends of elevating ropes or chains X', that pass over the sheaves on the flange-ring O' and have their inner ends extended down in the tubes G' and attached to the lower ends of the tubes P'. Similar ropes or chains, Y', have their outer ends attached to the flange-rings O', are passed over the sheaves on the rings R', and have their inner ends extended downward in the tubes P' and attached to the lower ends of the tubes S'. Each pair of shafts W' are geared together by spur-wheels Z' of equal diameter and having an equal number of teeth.

A² represents a pair of shafts which are journaled in the outer sides of the frames E' below the outer shafts, W'. Each of the said shafts A² is provided at one end with a pinion, B², which meshes with one of the wheels Z',

and is further provided with a large spur-wheel, C².

D² represents a shaft, which is journaled in bearings in the opposing inner sides of the frames E', and serves to connect the said frames together. The ends of the said shaft, which project beyond the inner side of the frames, are provided with pinions E², that mesh with the wheels C². Friction-pulleys F² are attached to the shaft D² and bear against the inner side of the frames, and the central portion of the said shaft between the said friction-pulleys is bent to form a crank, G².

H² represents a pair of brake-levers, which are pivoted to the inner side of the frames E'. Friction-straps I² are passed around the peripheries of the friction-pulleys, have one end attached to the frames E', and the opposite ends attached to the brake-levers H². One of the shafts A² is provided on its inner end with a ratchet-wheel, K², and a gravity-pawl, L², is pivoted to one of the frames E', and is adapted to engage the ratchet-wheel, K². From the inner corner of the frame E', near the front end of the base, projects a horizontal supporting-arm, M², having an opening in its outer end. A rod, O², is suspended from the said openings, and is free to oscillate. The function of this rod is to serve as a plumb and indicate when the base is in a horizontal position by noting if the plumb is ranged parallel with the inner edge of the approximate frame E'.

P² represents an elevated platform, which is supported at a suitable height above the base by a pair of standards, R. The said platform has a railing on its outer side and at one end, and is open on its inner side nearest the telescopic tubes. From the open end of the platform depends a flight of steps, S², having suitable hand-railings, T². The said steps extend to within a slight distance of the ground.

U² represents a cage or platform, which is provided with a railing, V², and is provided at suitable distances from its ends with dependent vertical sleeves W², which are adapted to fit in the upper ends of the tubes S', and thereby attach the cage to the upper ends of the telescopic or intersliding elevating-tubes. The bottom of the platform is further provided with a number of openings, X², through which the hose pipes may be inserted, so that firemen may be stationed on the cage and elevated to a suitable height opposite the burning building, together with the upper end of the hose-pipes, thereby enabling the firemen to direct the streams of water into the burning building without the necessity of placing ladders on the walls thereof or entering the same and running the risk of being buried by falling walls.

The side of the railing V² which is opposite the platform P² is provided with a hinged gate, Y².

The operation of my invention is as follows: The fire-escape is drawn to one side of the burning building. The base B' is first adjusted

to a perfectly horizontal position, as previously described, so as to arrange the telescopic tubes in a vertical position, and a number of men stationed on the platform B', turn the crank shaft in the direction indicated by the arrows in Fig. 2, thereby causing the wheels Z' to be rotated by reason of the intermediate gearing connecting the said wheels to the crank-shaft. Inasmuch as a single crank operates both sets of wheels Z' in the two frames E', the said wheels Z' are turned at the same rate of speed and cause the drums or shafts W' to wind up the ropes or chains X', and thereby elevate the tubes P'. As the said tubes ascend, the chains or ropes Y' are caused to elevate the smaller tubes, S', and thereby raise the cage to the level of the windows in the house from which the inmates are to make their escape. When a suitable number of persons are on the cage, the rotation of the crank-shaft is reversed, thereby causing the telescopic tubes to move downward and lower the cage to the level of the platform P², when the gate Y² in the rear end of the cage is open and the persons thereon pass out through the gateway onto the platform and therefrom by means of the stairway to the ground. The descent of the cage may be regulated by grasping the brake-levers H² and depressing the same, so as to cause the friction-straps to exert the necessary friction on the friction-pulleys. While the cage is being elevated the pawl L² is turned, so as to cause it to engage the ratchet-wheel K², and thereby prevent the cage from lowering suddenly in case the persons elevating the same should for any reason release their grasp of the crank.

The valves (hereinbefore described) in the bottoms of the tubes G' serve as an additional security against the too rapid lowering of the cage, and the operation of the said valves is as follows: The sleeve L' is normally turned on the pipe I', so as to close the opening therein. As the tubes ascend in the exterior tubes, G', they create partial vacuums in the said exterior tubes, and the pressure of the external air against the under sides of the valves in the lower ends of said tubes causes the said valves to open, and thereby admit air into the tubes G'.

In the event that the elevating mechanism should get out of order or anything should break and the cage start to rapidly descend, the air in the tubes G' will become depressed therein by the pistons on the lower ends of the tubes S' and the packings on the lower ends of the tubes P', and will serve as cushions to support the said tubes and offer so much resistance thereto as to cause the cage to descend so slowly that persons standing thereon will not be injured.

In order to prevent the compressed air from offering too great resistance to the descent of the cage when the same is being lowered, the sleeve on the tube I' is partly turned, so as to uncover the opening in the said tube, and

thereby permit the air in the lower ends of the tube G' to escape through the said opening as the telescopic tubes descend.

The form of my invention hereinbefore described is particularly adapted for use by municipal fire-departments; but when the device is to be employed for only one building it will be constructed as shown in Fig. 4. In this case I dispense entirely with the platform A, its supporting-trucks, and the means for inclining the platform laterally, and provide the base B' with supporting wheels or rollers a, which permit it to be rolled from one place to another and adapt the said base B' to be adjusted to a horizontal position by means of screws b, which pass downward through the corners thereof and are adapted to come in contact with the ground and raise the base and supporting-rollers a therefrom when the screws are turned.

I am aware that it has been heretofore proposed to provide a fire-escape with telescoping standards hinged to a supporting-platform, a platform hinged to the upper ends of said standards, means for raising the standards into an upright position, and elevating-ropes connected to the standards and to windlasses to extend the telescoping standards, and thereby elevate the tower; but such is not my construction, and this I disclaim. My invention differs from this in that I have a single-crank shaft geared to the telescoping standards or tubes, to raise or lower both sets simultaneously and at the same rate of speed, and thereby prevent them from binding.

Having thus described my invention, I claim—

1. The combination, in a fire-escape, of the two sets of telescopic or intersliding tubes, the cage carried thereby, the gearing to operate the said tubes and thereby raise or lower the cage, and the single-crank shaft to impart motion to the said gearing, whereby both sets of telescopic tubes will be raised or lowered at the same rate of speed, and thereby prevented from binding, substantially as described.

2. The combination of the intersliding or telescopic tubes G', P', and S', the shafts W' on opposite sides of the tube G', the gear-wheels of similar size secured on the said shafts and meshing with each other, the elevating ropes or chains X', attached to the lower end of the tube P', passing over guiding-sheaves on opposite sides of the tube G' on the upper end thereof and having their outer ends attached to the shafts or drums W' and adapted to be

wound thereon when the said shafts are rotated, and means, substantially as set forth, to rotate the said shafts, substantially as described.

3. The combination, in a fire-escape, of the intersliding or telescopic tubes, the lower one of which is provided with an inlet-opening valve, the interior tubes fitting snugly in the exterior or lower tubes, the tube I', connecting the lower ends of the exterior tubes and having the opening K', and means, substantially as set forth, to open or close the said opening, substantially as described.

4. The combination, in a fire-escape, of the portable base having the two sets of valved intersliding or telescopic tubes, the cage carried by the said tubes, mechanism to operate the tubes, and thereby raise and lower the cage, the tube I', connecting the lower ends of the telescopic tubes and having the opening K', the sleeve fitted snugly on the said tubes, having the opening adapted to register with the opening K', and the arm M', and the rod N', attached to the said arm and extending up through an opening in the portable base, for the purpose set forth, substantially as described.

5. The combination, in a portable fire-escape, of the platform, the axles on which the platform is centrally hinged or pivoted, and thereby adapted to tilt laterally, and the rock-shaft having the eccentric cam adapted to tilt the platform A, the base B', hinged or pivoted on the platform A and adapted to tilt or incline longitudinally thereon, the rock-shaft W, having the eccentric cams to raise or lower one end of the supporting-base, and the intersliding or telescopic tubes supported on the base and carrying the cage, substantially as described.

6. The combination, in a portable fire-escape, of the base adapted to be adjusted to a horizontal position and carrying the intersliding or telescopic tubes, the cage attached thereto, and the plumb swinging freely from an elevated support, near one corner of the base, for the purpose set forth, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of three witnesses.

WILLIAM BROWN.

Witnesses:

E. G. SIGGERS,
JOHN H. SIGGERS,
M. E. FOWLER.