S. Perfield.

Fire Escape.

No. 1,505. Patented Mar. 3, 1840.

Fig. 1.

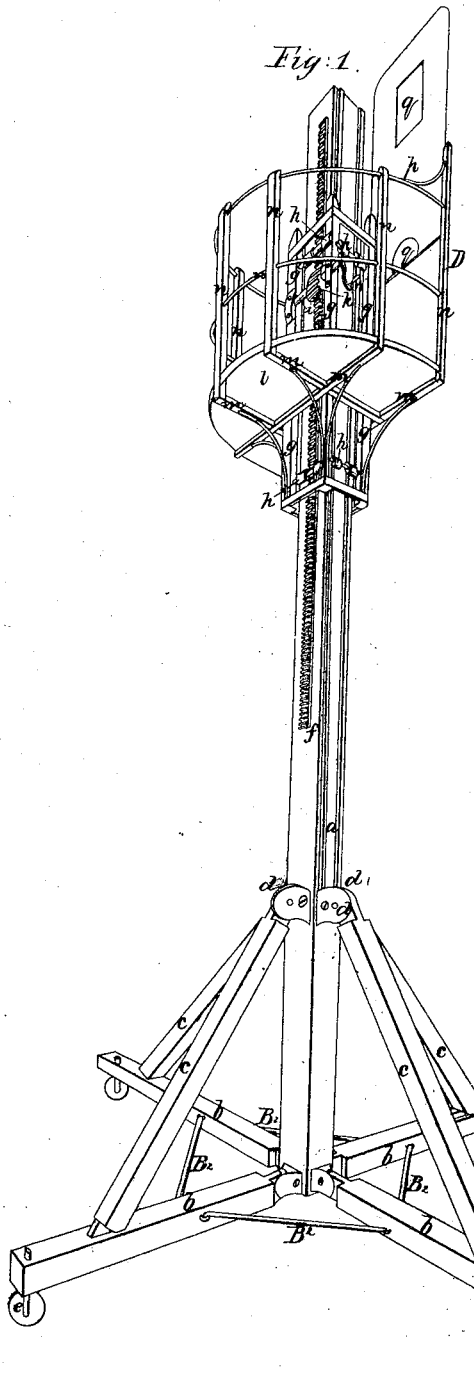


Fig. 2.

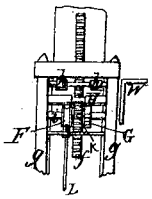


Fig. 3.

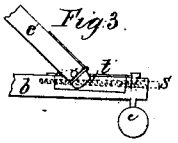


Fig. 4.

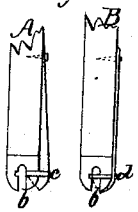
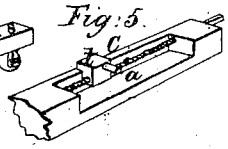


Fig. 5.



THE GRAPHIC CO. PHOTO-LITH. 39 & 41 PARK PLACE, N.Y.

UNITED STATES PATENT OFFICE.

SYLVESTER PENFIELD, OF HARTFORD, CONNECTICUT.

FIRE-ESCAPE.

Specification of Letters Patent No. 1,505, dated March 3, 1840.

To all whom it may concern:

Be it known that I, SYLVESTER PENFIELD, of Hartford, in the county of Hartford and State of Connecticut, have invented a new and useful Machine to Assist in Extinguishing Fires and in Rescuing Persons or Goods from the Windows or Doors of the Lofts of Buildings on Fire; and I do hereby declare that the following is a full and exact description, reference being had to the annexed drawings of the same, making part of this specification.

The nature of my invention consists in erecting a single pole, column, or shaft, properly supported at the base of sufficient length and strength vertically in front of and contiguous to the door or window from which persons or goods are to be taken, or when used to extinguish fires, to be placed in a suitable position for that purpose. Up this shaft one or more persons may elevate themselves at pleasure, standing in a frame called the cage, by means of the rack and pinion action, the pinion being turned by a crank or cranks by the person or persons in the cage.

To enable such mechanics as are in the habit of executing similar work to make and use my invention, I will proceed to describe its construction and operation.

Figure 1 is a perspective view of the fire escape. Fig. 2 is a front view of the rack and pinion, ratchet wheel, pawl and brake. Fig. 3 represents the manner of attaching the foot of the brace to the sliding block and the screw for moving it when it is required to adjust the shaft. Fig. 4 represents the spring bolt in the foot of the brace for securing it to the slide. Fig. 5 is a vertical section of part one of the arms showing the mortise and the block to which the brace is attached sliding therein and the screw for moving it.

The shaft a in the accompanying drawing.—The length of this may be such as to reach any desirable height and its proportionable size should be sufficient to prevent tortive and lateral action when in use. To insure the more strength and stiffness with a small amount of material, I usually construct the shaft of four pieces of plank so jointed together longitudinally as to form a square hollow tube. A shaft so constructed of the length of 40 feet should be about 10 inches square. To form a base to the shaft, and to preserve it in a vertical position, I extend a piece of timber, *b*, *b*, *b*, *b*, from each of its sides, at the foot at right angles called the arms. The length of the arms should be proportioned to the height of the shaft, say about 7 feet to 40. The arms are connected to the shaft by metallic fastenings which form a hinge, permitting the arms to be folded up, against the sides of the shaft, to facilitate transportation. To give steadiness and firmness, braces *c*, *c*, *c*, *c*, are extended from the arms to the shaft. The braces are in like manner connected to the shaft by metallic joints, similar to and for the same purpose as those just described. Nothing peculiar is requisite in the construction of these joints; an idea of the manner in which I usually construct them may be obtained by inspecting the drawings at *d*. The feet of the braces are connected to the arms by a tenon wrought on the end of the brace entering a mortise in the arms, and are fastened in their places by movable pins or bolts passing through them. To this mode of fastening the braces that on the rear or back side is an exception. It being necessary sometimes to adapt the arms to uneven ground, I have resorted to the expedient (in the case of the arms and brace in question) of making the footing of the brace movable in the arm by means of a horizontal screw *s* passed through a sliding block or piece of metal as shown at *t*, Fig. 5, in the drawing, where the front side of the part forming the mortise is represented as being removed, the better to show the action of the internal apparatus the foot of said brace being attached to said sliding block which is moved by the screw. It may be sometimes necessary to place the machine very near to the building. In this case the arm and brace on the rear side may be removed. To facilitate this operation, I usually cut out the pin hole in the tenons of the brace, and also that of the arm as represented at *b* in sections, Fig. 1 of the drawing. The fastening in these cases is effected by a spring bolt represented at *c* and *d*, in sections A and B, of the drawing Fig. 4. The bolt is shown as withdrawn at *c* and as thrust home to its place at *d*. The feet of all the braces may be attached to sliding blocks of metal pierced with female screws to admit male screws over which they are to move backward and forward by turning said screws as represented in Figs. 3 and 5 in order to adjust the shaft; this mode is preferred.

To render the moving of the machine to small distances from place to place when in operation, easy, I apply rollers or casters, *e*, *e*, *e*, *e*, of the common construction to the arms near their outer ends, I use lateral braces B^2 made of round iron, to preserve the angular position of the arms, and to steady them; these are made fast at one end by a staple passing through a hole in that end of it, which is then driven into one of the arms, while the other end is made to hook into a staple in the next arm. A rack *f* with cogs or teeth to receive those of the pinion *k* is made fast to the front side of the shaft extending vertically along its surface quite to its top, which completes the description of the shaft with its base.

The cage D.—This I construct by first making a square frame of small scantling, consisting of four upright pieces *g*, *g*, *g*, *g*, about 6 feet in length connected by straps of iron or otherwise at each end. The inside dimensions of this frame must be such as to receive the shaft loosely within it. Near each end of this frame friction rollers *h*, *h*, *h*, *h*, are placed on each of its four sides. The pivots of the friction rollers are inserted into the pieces of scantling forming the frame. These rollers are intended to diminish friction between the frame and the shaft as the cage passes up and down the shaft. An arbor, *i*, is made to extend quite across the front of the frame near its upper end having a crank or winch W at either end, turning in suitable boxes which are made fast to the two front upright pieces of the frame. This arbor serves as an axis for the pinion *k*, which is so adjusted upon it, as to coincide with and ply into the rack or shaft already described. On the same arbor are two other wheels F and G (not seen in Fig. 1, but seen in Fig. 2) of about the same diameter as the pinion the one G with saw-like shaped teeth to receive a hook or click H serving as a detent to retain the cage with its burden at any desirable height. The other F is a smooth wheel intended to govern the velocity of the cage in its descent without the aid of the cranks;—this purpose is effected by a lever L which is made to bear upon the periphery of the wheel and thereby create friction, by a person within the cage, the principle of this action being the same as is every day seen needs here no further explanation. To complete the cage a semicircular platform, *l*, of 3 to 4 feet radius is affixed toward, the lower end of the frame already described, being supported by suitable stays *m*, *m*, *m*, *m*, being made fast to the upright parts of the frame. A protecting railing *n*, *n*, *n*, *n*, is erected around the platform extending vertically from its upper surface say 3 to 4 feet. The back side of the cage is armed with an apparatus which I denominate the shield *o*. This is simply plates of polished sheet iron to reflect the heat covering the back-side of the cage, on each side of the shaft. As a further protection a plate of sheet iron *p* is adapted to slide in grooves formed in the frame work of the cage to a height equaling or exceeding that of a man standing in the cage. Holes *q*, *q*, are made in these slides through which the pipe of the hose may be pointed when the machine is used to extinguish fire. Said shield may likewise be composed of wood and iron combined—the wood being on the inside to serve as a non-conductor of heat and the iron on the outside to prevent the wood from burning.

The operation of this machine I think may be readily inferred from the foregoing description. Suffice it to say in addition, that when persons or goods are to be received from the windows or doors of the lofts of buildings the machine being erected and adjusted in the proper position, a person enters the cage, and by turning the crank elevates himself to the proper height, the cage then resting or sustaining itself by means of the click, proceeds to receive the persons or goods into the cage, and with them descends graduating the descent either by the crank or friction wheel. When used to extinguish fire the operator receives the pipe and so much of the hose as is necessary into the cage which affords him ample room and convenience for effectually directing the water.

What I claim as my invention and desire to secure by Letters Patent is—

1. Combining with the movable platform plates of polished metal or of wood and metal combined as herein set forth the said plates sliding in grooves at the back of the platform and serving as fire shields to protect those upon it from the flames.

2. The mode of keeping the shaft in a vertical position so as to adapt it to any inequality of soil by means of the following combined arrangement viz: the arms *b* hinged to the shaft so as to admit of their being raised or lowered in combination with the braces *c* attached to the block *t*, moving in a mortise in the aforesaid arm *b* and regulated by means of a screw *s* all as here described.

SYLVESTER PENFIELD.

Witnesses:

WILLIAM P. ELLIOT,

EDMUND MAHER.