

(No Model.)

2 Sheets—Sheet 1.

G. H. THOMPSON.

LADDER.

No. 381,656.

Patented Apr. 24, 1888.

Fig. 1.

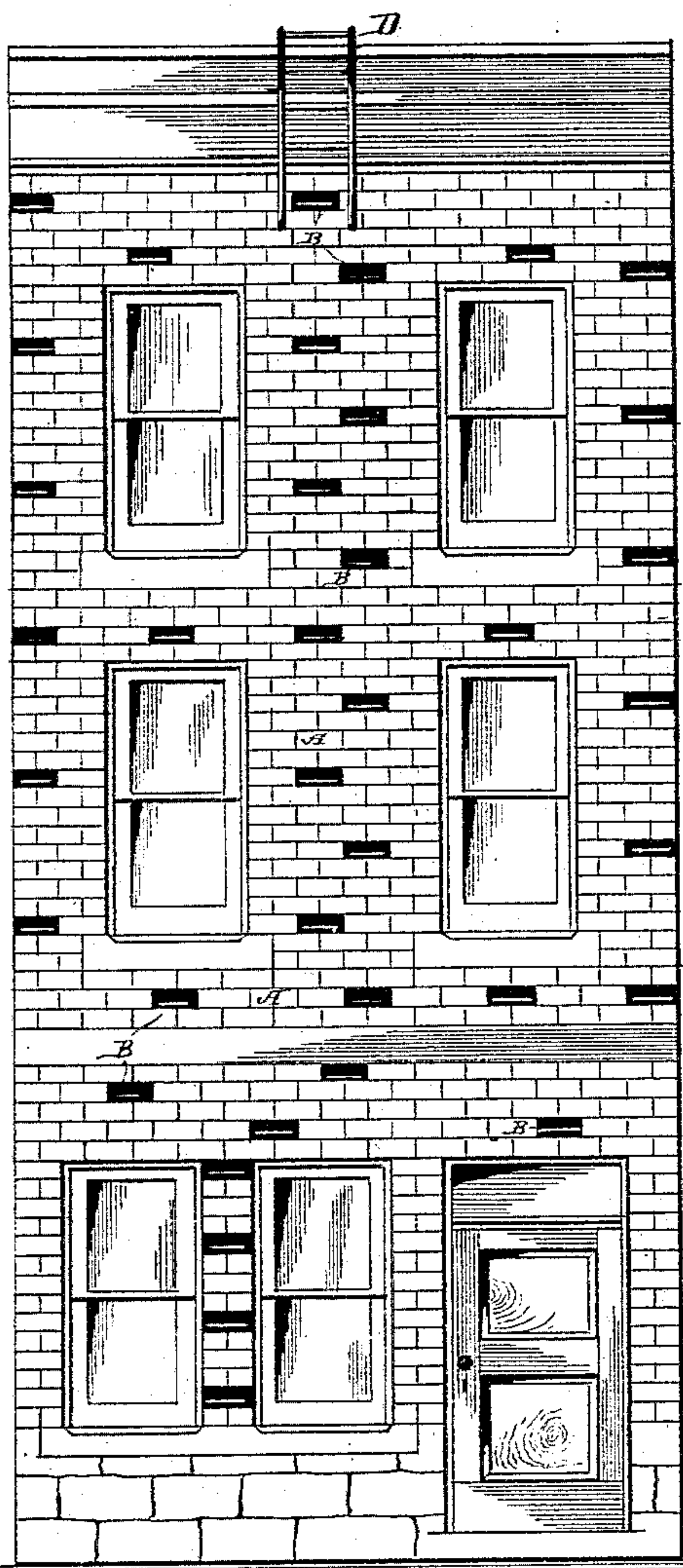
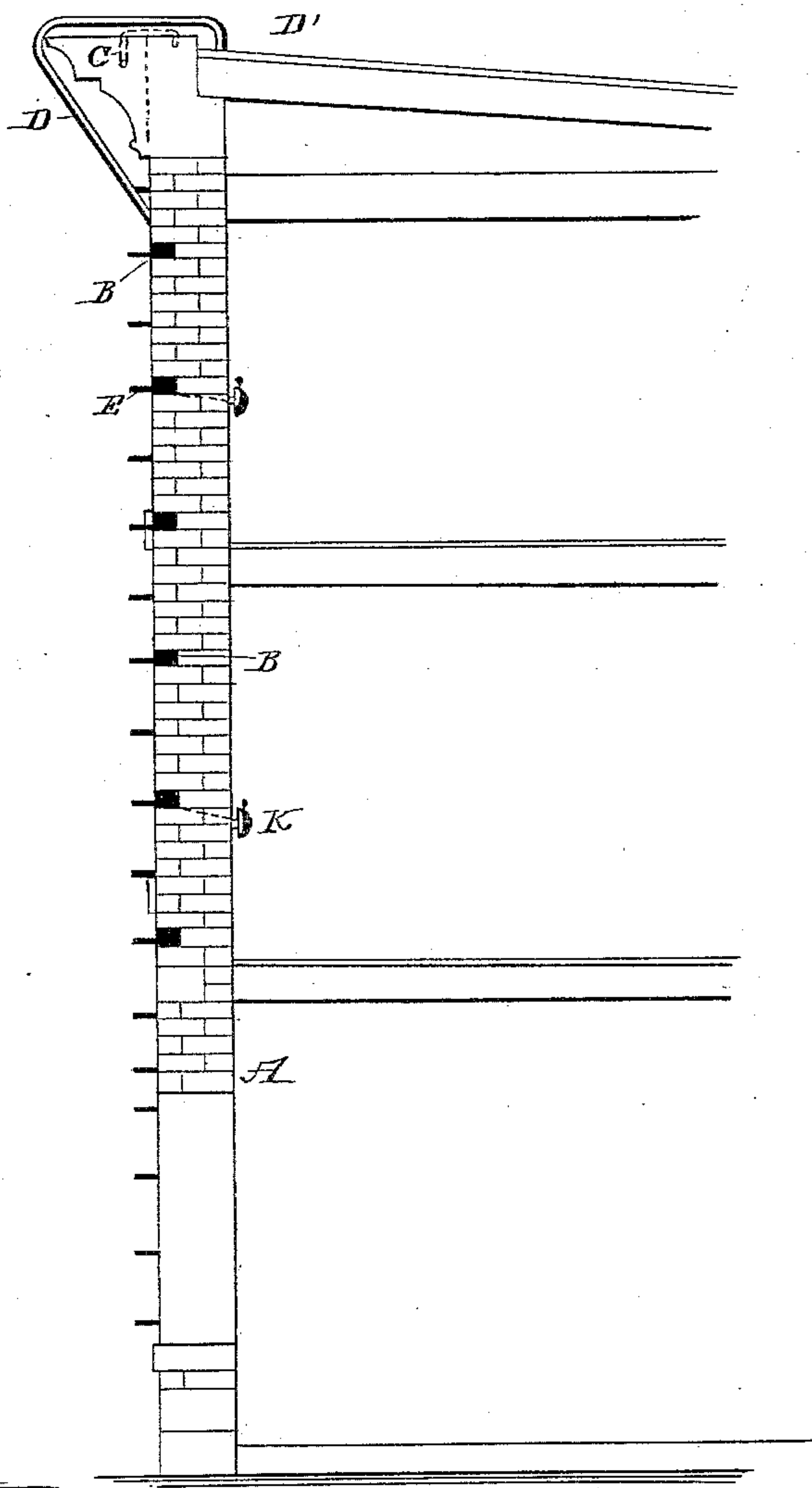


Fig. 2.



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2 Sheets—Sheet 2.

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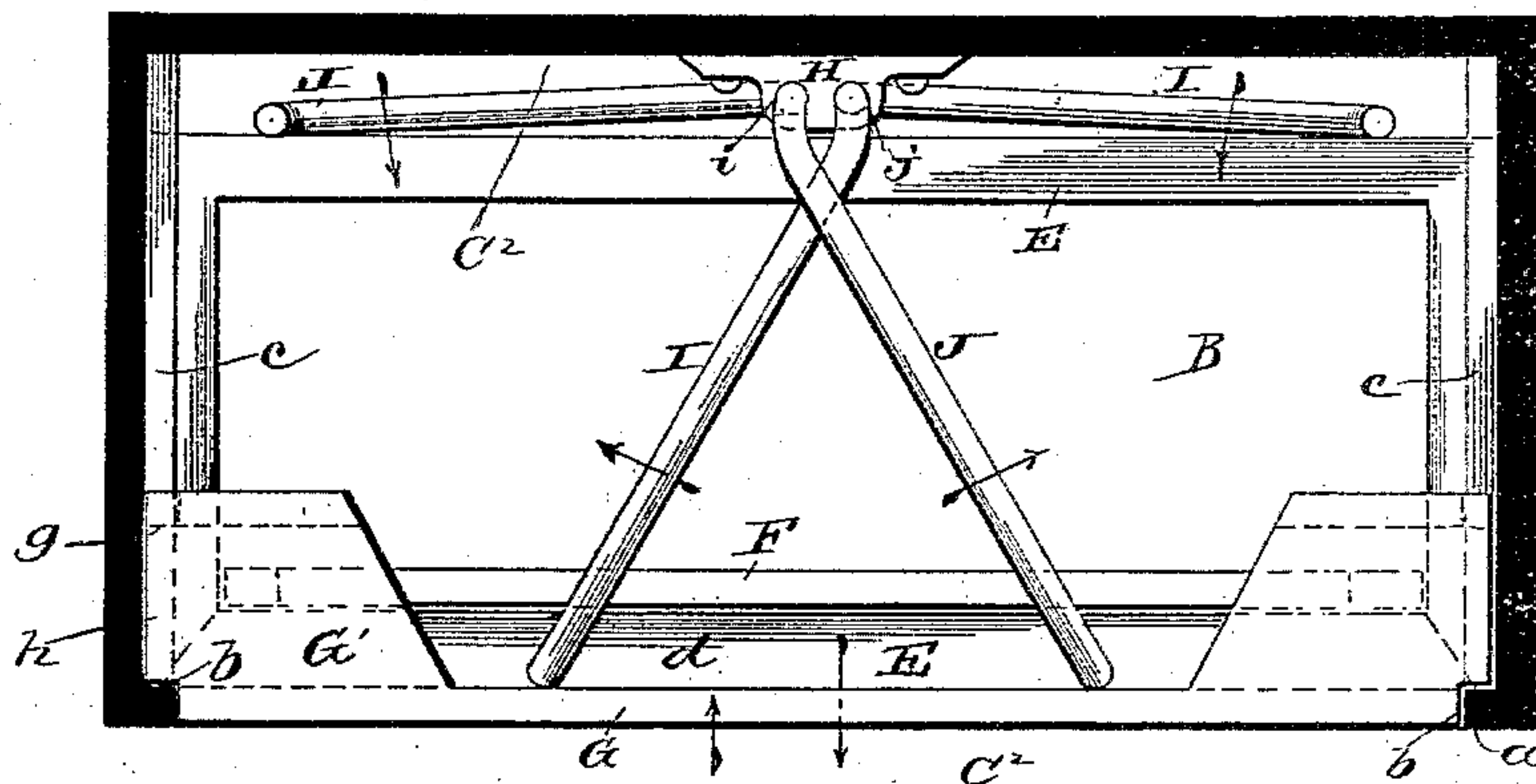


Fig. 3.

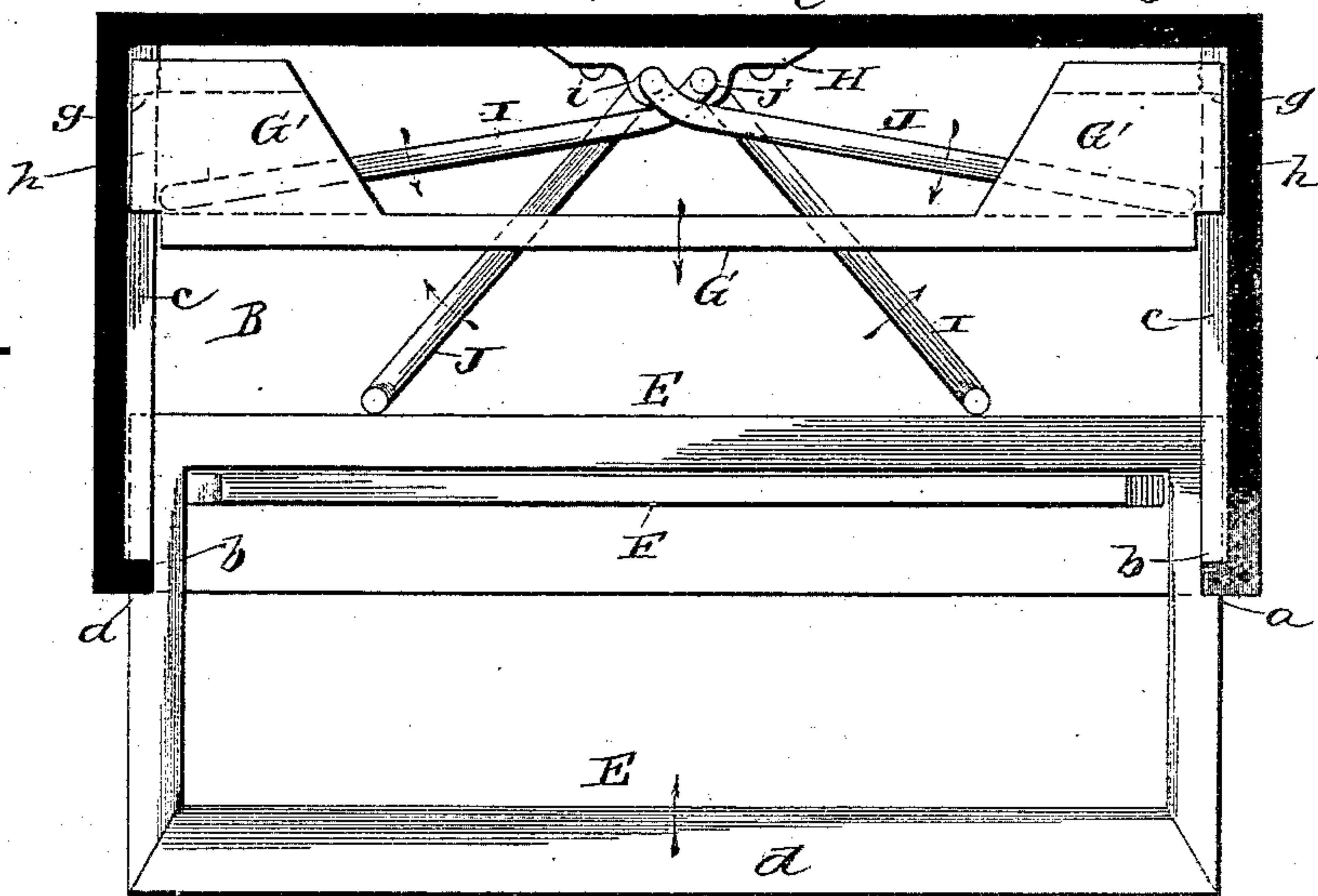


Fig. 4.

Fig. 5.

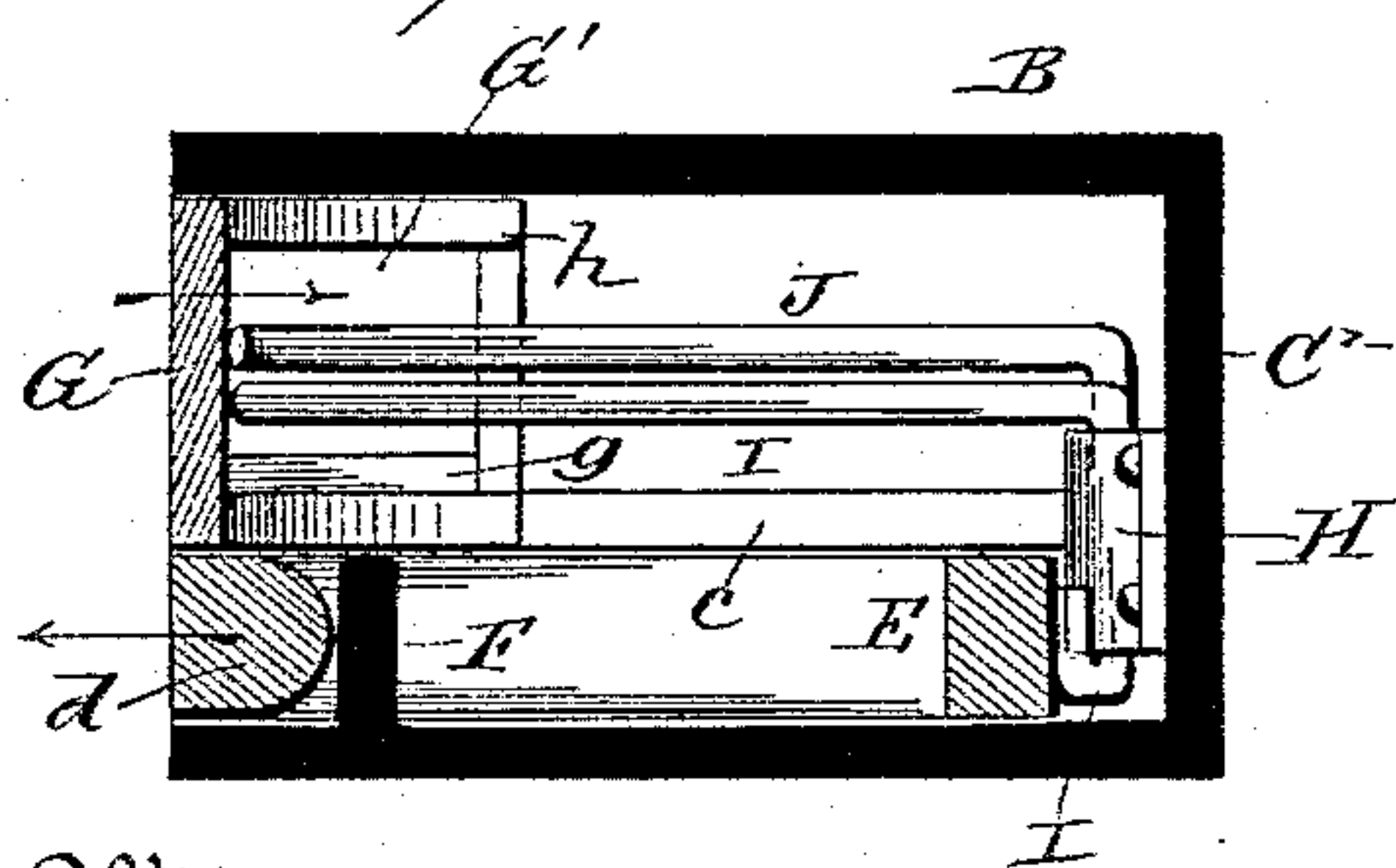
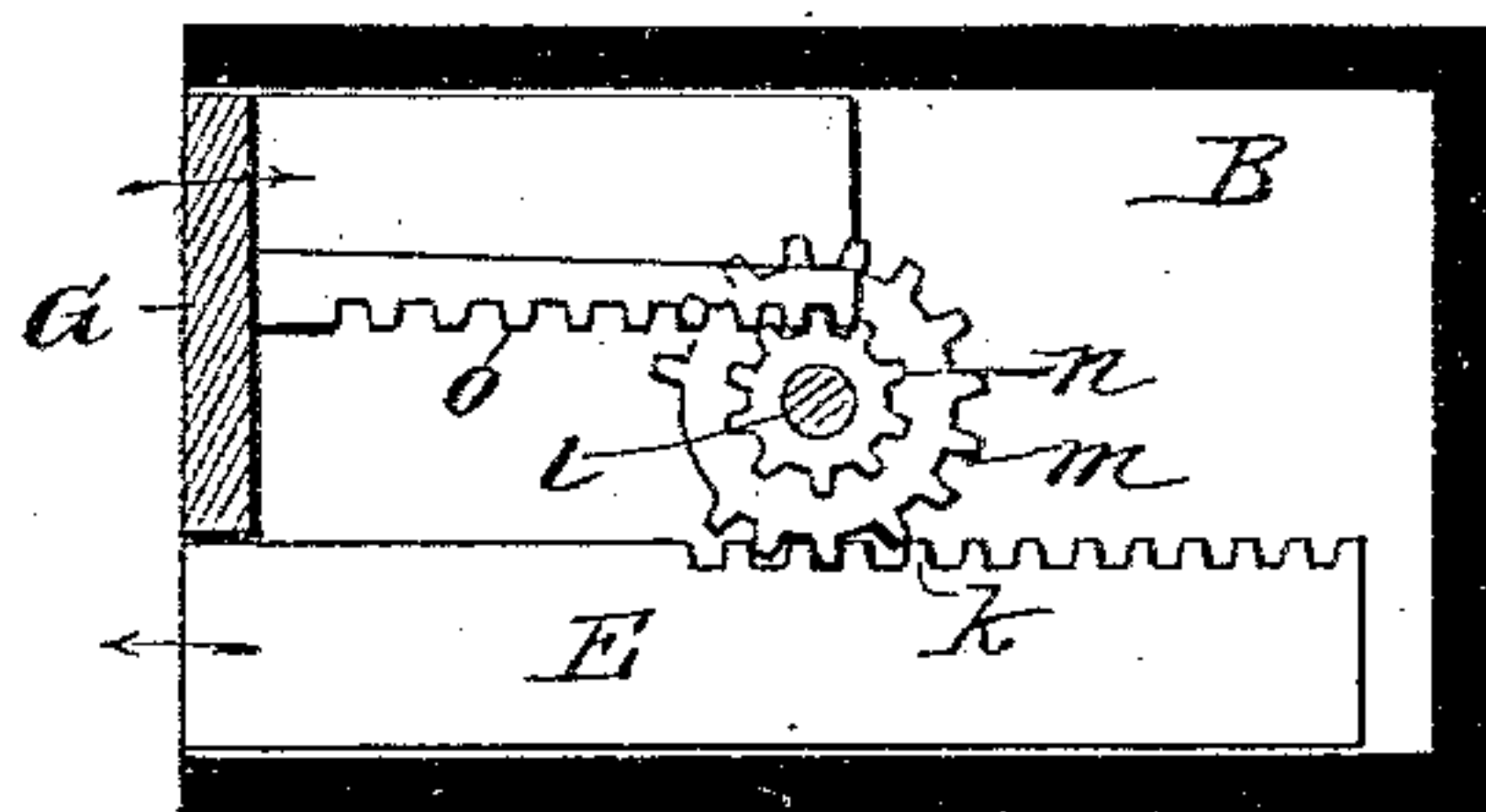


Fig. 6.



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UNITED STATES PATENT OFFICE.

GEORGE H. THOMPSON, OF READING, PENNSYLVANIA.

LADDER.

SPECIFICATION forming part of Letters Patent No. 381,656, dated April 24, 1888.

Application filed December 29, 1887. Serial No. 259,300. (No model.)

To all whom it may concern:

Be it known that I, GEORGE H. THOMPSON, of Reading, in the county of Berks and State of Pennsylvania, have invented certain new and useful Improvements in Ladders; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to ladders, and more particularly to such as are used as fire-escapes.

The object of my present invention is to provide a fire-escape ladder which shall occupy but little space, and which will not disfigure the building to which it is applied.

A further object is to produce a ladder capable of being built with the building or placed in the structure during its construction.

A further object is to so construct the ladder that when not in use it will be out of sight and protected from the weather.

A further object is to construct the device in such a manner that it can be brought into use quickly and easily by any person.

A further object is to provide a ladder with devices by which the occupants of the house may be notified when the ladder is used by an unauthorized party.

A further object is to produce a fire-escape ladder which shall be simple in construction, possessing a due amount of strength, and comparatively cheap to manufacture.

With these objects in view my invention consists in the novel construction and peculiar combination and arrangement of parts, as will be hereinafter set forth, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a front elevation of a building having my improved devices applied thereto. Fig. 2 is a vertical section of the same. Fig. 3 is a top plan view of one of the metallic boxes with the top plate removed and the parts in their normal positions. Fig. 4 is a similar view showing the step in position for use. Fig. 5 is a cross-section of a metallic brick or box and contained parts. Fig. 6 is a view of a modification.

A indicates a wall of a structure, built preferably of brick or masonry, and provided at suitable intervals from top to bottom with

boxes B, which will be hereinafter more fully described.

When the building is not provided with a cornice, the series of boxes will extend to within a few inches of the top of the wall, a bracket, C, being secured to the roof or upper extremity of the wall and projected somewhat beyond the edge thereof, by means of which persons may be aided in reaching the roof, and this bracket may also serve as a support for a hose. If the house be provided with a cornice, a short iron ladder, D, will be secured at one end to the roof D' in any suitable manner, and at its other end to the wall A in close proximity to the uppermost box, B. Each box B is constructed of iron or other suitable material and about the size of an ordinary brick, having one of its side faces left open, as shown in Fig. 4. At each end of said open face is an inwardly-projecting flange, *a*, which extends from the top of the box downwardly about three-quarters the thickness of the box, thus producing a recess, *b*.

Made integral with or secured to the inner surfaces of the end plates of the box B, and in alignment with the lower end of the flanges *a*, are guide-strips *c*, which, together with the recesses *b*, serve as guides for a sliding step, E, as shown in Fig. 4. This step E comprises a rectangular frame having the inner edge of its front connecting-bar, *d*, rounded, so that it may be grasped without injury to the hand. An upwardly-projecting flange, F, is made integral with or secured to the inner surface of the bottom of the box B, near the open end thereof, and serves as a stop to limit the outward movement of the step E, sufficient space being left between the ends of the flange F and the ends of the box to permit the passage of the end connecting-bars of the step.

By constructing the step E as above set forth it is rendered light and substantial, and by its arrangement within the box it is permitted to have a limited sliding movement in the same, and is capable of sustaining the weight of a person, being held in its rigid horizontal position by means of the strips *c*.

Mounted upon the strips *c* is a sliding block, G, comprising a front plate adapted to produce a finish to the box B and form a continuous surface to the outer face thereof, and two

hollow end blocks, G'. The hollow blocks G' are provided on the inner surfaces of their bottom portions with laterally-projecting pads or bearings *g*, adapted to rest and slide upon the strips *c*, thus permitting the front plate of the sliding block G to extend slightly below the strips *c* and make a close joint with the step when the device is out of use. By this arrangement the working parts of the device are protected from the weather, and, being made of metal, are kept free from rust, which would seriously injure the device and prevent its free and easy working. The top portions of the hollow blocks G' are projected slightly beyond the ends of the sliding block or plate G, as at *h*, and adapted to bear against the vertical flanges *a* and prevent the sliding block from projecting beyond the front surface of the box C, the outer edges of the pads *g* also abutting against said flanges and serving the same office as the projections *h*.

Fixed to the inner surface of the back plate, C², of the box B, and at or about the center thereof, is a bracket, H, having two parallel perforations, *i j*, made vertically through it. This bracket serves as a fulcrum for two levers, I J, which are passed loosely through these perforations *i j*, and are adapted to turn therein. The levers I J are preferably made of heavy brass or steel wire and bent in the form shown in Fig. 3. As shown in said figure, the lower portions of the levers are extended in opposite directions from the bracket H along the bottom of the box and parallel with the rear plate thereof, their extremities being bent upwardly and adapted to have a broad bearing upon the rear connecting-bar of the step E. The levers I J are bent upwardly at right angles at their inner ends and passed through the perforations *i j* of the bracket H. After passing through said bracket, the levers are bent at an obtuse angle to their lower portions, and, being crossed at a point near the bracket, are extended forwardly to the inner surface of the sliding block G, against which they are adapted to bear and have a sliding movement.

If desired, the inner face of the block G may be grooved to serve as guides for the ends of the levers, and the opposite extremities of said levers may be guided by suitable guide-bars fixed to the rear connecting-bar of the step E, although neither of these provisions is essential.

The boxes, or "metallic bricks," as I prefer to term them, being thus constructed and arranged, are placed in the wall of a structure, either in its process of construction or after the completion of the building, as circumstances may require. If the building be of the general style of architecture shown in the drawings, there will preferably be one series of these boxes or bricks arranged in zigzag order from the top to near the bottom of the building at intervals of about the thickness of four or five bricks, the purpose of such zigzag arrangement being obvious. Other series of boxes or bricks may be arranged along the vertical edges of the

walls, and others on the lower portions of the walls leading to the ground. Boxes will also advisably be placed over and under each window, to enable occupants of the house and firemen to get in and out of the windows.

In case of large buildings—such as hotels—the arrangements of the boxes to produce an escape-ladder will be at the discretion of the builder.

In order to guard against the use of the ladder produced by the above-described arrangement of boxes and steps by unauthorized persons, a bell, K, is placed in each room of the building by which the ladder passes, and connected by means of a wire or otherwise to one of the working parts of the stepped boxes, said wire passing through the wall of the building and the rear plate of the box B. In case of a hotel, one of the working parts of the device will preferably be attached to the system of electric bells by means of suitable connections, and thus provide means for notifying the hotel-clerk of the improper use of the ladder.

When it is desired to use the ladder in descending, the block G of the first box B reached will be pressed inwardly by the hand, thereby causing the upper ends of the levers to slide along the inner surface of said block in reverse directions, and thus cause the levers to turn in the bracket H. The levers being made to turn, their upper arms will move rearwardly with the block G, and their lower extremities will move outwardly and push the step E forwardly beyond the front face of the box B. As the person on the ladder descends, he will operate the boxes beneath him by his foot; but when a person is ascending the ladder the boxes will be operated by hand.

A modification of the operating parts of the device is shown in Fig. 6. In this modified construction the end connecting-bars of the steps E are provided with rack-bars *k* on their upper surface. A shaft, *l*, is journaled in the box and furnished near each end with a pinion, *m*, and a smaller pinion, *n*, the former being adapted to mesh with the rack-bars *k* and the latter pinions, *n*, made to mesh with rack-bars *o*, fixed to the under edge of the blocks G' near each end.

It is obvious that this device may be used in climbing high stacks of bricks and for ascending to the roof of a building under ordinary circumstances. The boxes may be painted a different color from the bricks of the building, and thus be clearly distinguishable, and at the same time present an ornamental appearance to the building.

Slight changes might be made in the constructive details of my invention without departing from the spirit thereof; hence I do not wish to limit myself to the precise details of construction herein set forth; but,

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. An angular box adapted to be set in the

wall of a building and having a sliding step, and mechanism located within the box for moving the step outwardly, substantially as set forth.

5 2. An angular box adapted to be set in the wall of a building and having one open face and a sliding step located wholly within the box, the outer face of said step, when the latter is in its closed position, resting flush with
10 the side edges of the open face of the box, substantially as set forth.

3. A ladder composed of a series of boxes, a step in each box, mechanism for sliding said step, a stop to limit its outward movement,
15 and strips in the box to sustain the weight brought to bear upon the step, substantially as set forth.

4. A ladder composed of a series of boxes, a step in each box, levers in the box, a stop for
20 limiting the outward movement of the step, and mechanism for operating the levers to slide the step, substantially as set forth.

5. A ladder composed of a series of boxes, a step in each box, a stop to limit the forward
25 movement of said step, a sliding block mounted on bearings above the step, a bracket secured in the box, and levers fulcrumed in the bracket and bearing at their ends against the sliding block and the step, substantially as set
30 forth.

6. A ladder composed of a series of boxes, a step in each box, a stop to limit the forward movement of the step, a sliding block mounted
35 in the box above the step, a bracket secured within the box, a pair of levers fulcrumed in the bracket and having their free lower ends bent at right angles to said brackets and adapted to bear against the step, and the upper ends of the levers bent at right angles to
40 the bracket and made to cross at a point above the bracket and bear at their free extremities against the sliding block, substantially as set forth.

7. A ladder composed of a series of boxes
45 having open faces and an inwardly-projecting flange at each end of the open face of each box, strips on the end plates of the box, a step in each box beneath said flanges and strips, a stop to limit the forward movement
50 of the step, a sliding block provided with hollow boxes adapted to slide on said strips, and

levers fulcrumed in the box and bearing at their free ends upon the steps and sliding block, respectively, substantially as set forth.

8. A ladder composed of a series of boxes, 55 a step in each box, a stop to limit the forward movement of said step, a sliding block having hollow blocks fixed thereto, projecting pads secured to said hollow blocks and adapted to slide upon bearings above the step, and levers 60 fulcrumed in the box and bearing at their respective ends against the step and sliding block, substantially as set forth.

9. The combination, with a box adapted to be set into the wall of a building and having 65 a sliding step, of a sliding block and intermediate connections, whereby a movement imparted in one direction either to the step or block moves the other of said parts in the opposite direction. 70c

10. The combination, with a building, of a series of boxes secured in the walls thereof and a sliding step in each box, substantially as set forth.

11. The combination, with a building, of a 75 series of boxes secured in the walls thereof at suitable intervals, a sliding step in each box, a sliding block mounted in the box above the step, and levers fulcrumed in the box and bearing upon the sliding block and step, respectively, substantially as set forth. 80

12. The combination, with a building, of a series of boxes secured in the walls thereof, a sliding step in each box, a sliding block mounted in the box above the step, and mechanism 85 for operating said step and block to conceal the working parts of the device, or adapt the same for use, as desired, substantially as and for the purpose set forth.

13. The combination, with a building, of a 90 series of boxes secured in a wall thereof, a sliding step in each box, and a bell connected with one of said steps, whereby when the step is moved the bell is sounded.

In testimony whereof I have signed this 95 specification in the presence of two subscribing witnesses.

GEORGE H. THOMPSON.

Witnesses:

J. C. FETTER,
E. W. FOX.