

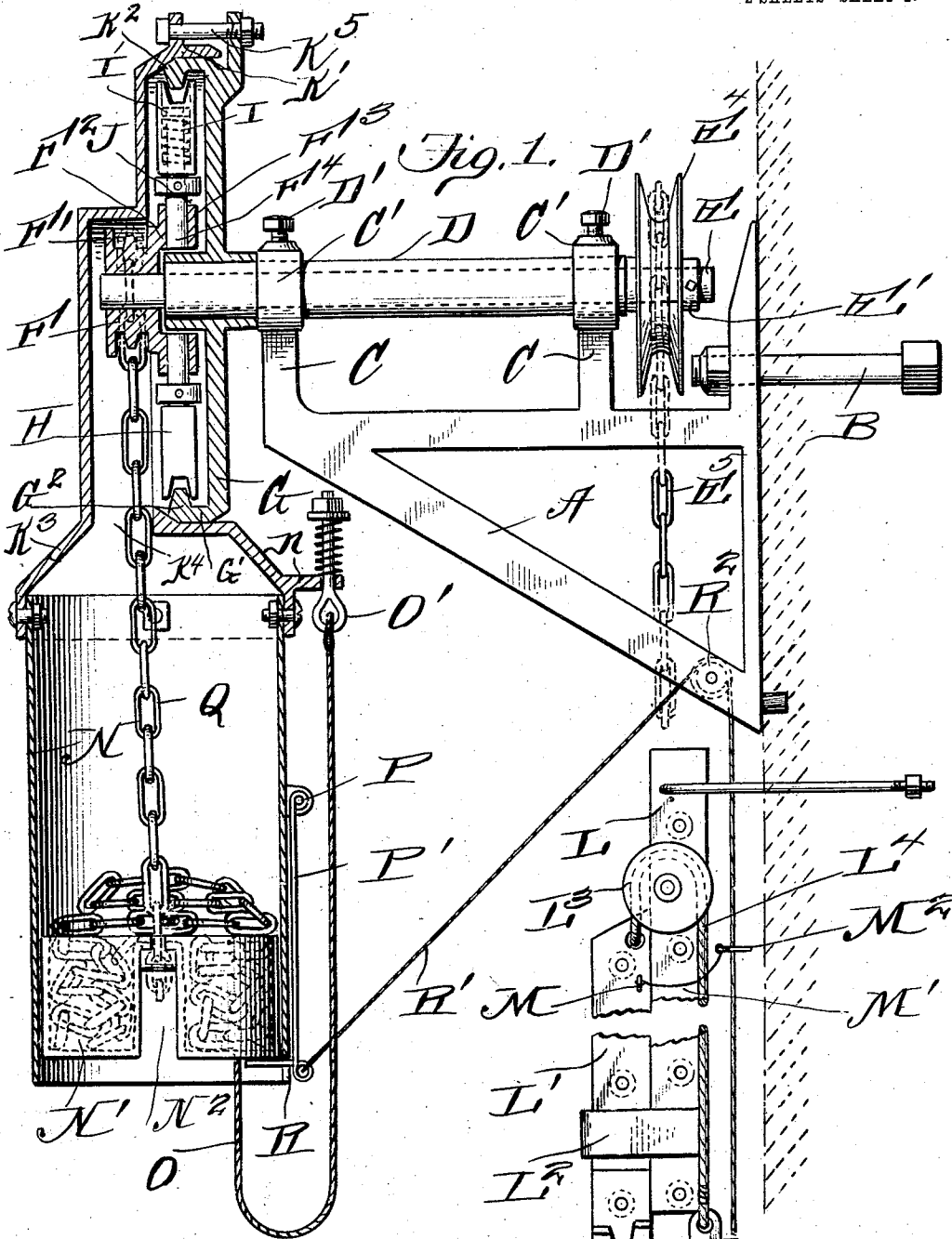
No. 853,302.

PATENTED MAY 14, 1907.

E. F. G. GIBBS.
FIRE ESCAPE.

APPLICATION FILED APR. 25, 1906.

2 SHEETS—SHEET 1.



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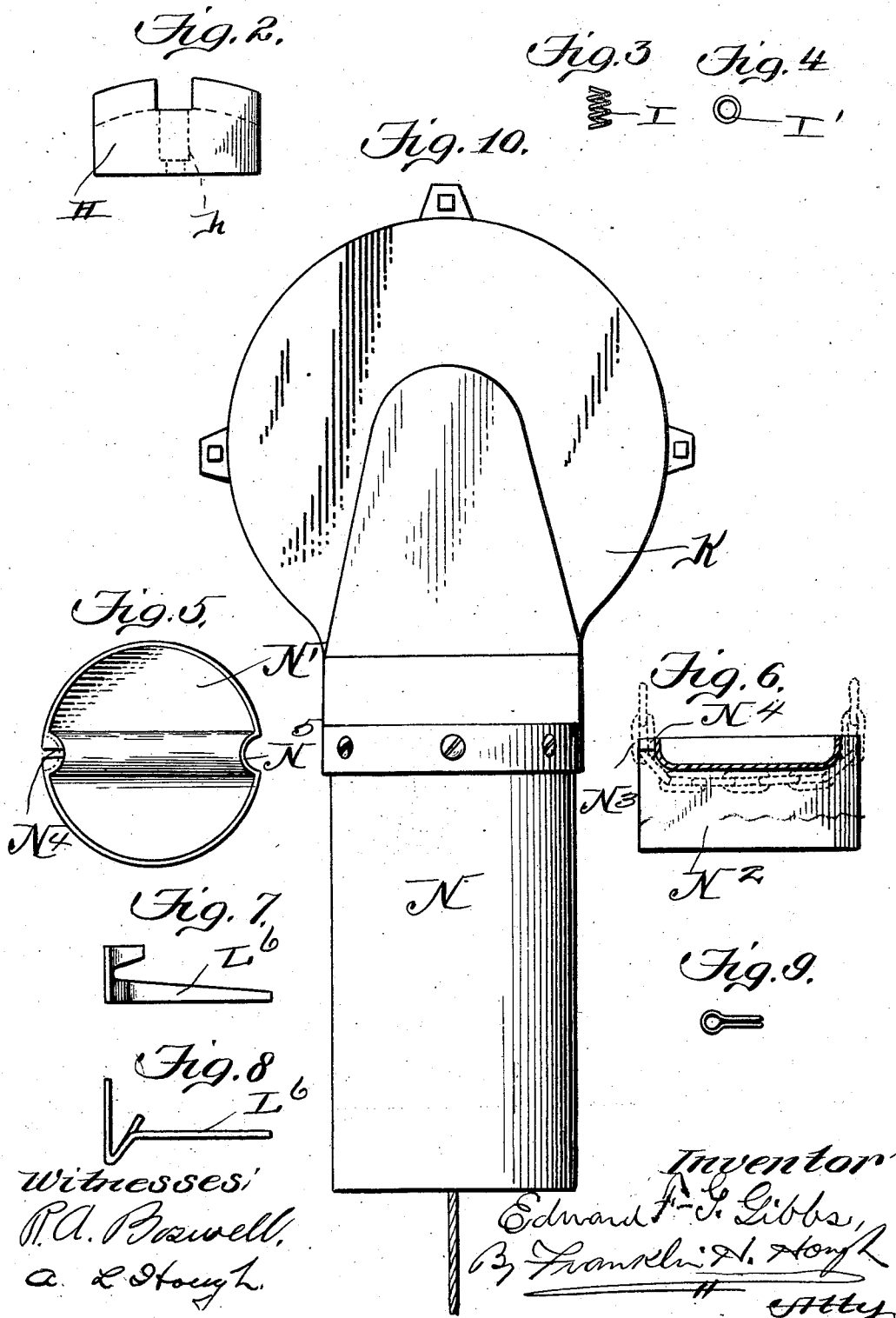
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UNITED STATES PATENT OFFICE.

EDWARD F. G. GIBBS, OF WASHINGTON, DISTRICT OF COLUMBIA.

FIRE-ESCAPE.

No. 853,302.

Specification of Letters Patent.

Patented May 14, 1907.

Application filed April 25, 1906. Serial No. 313,608.

To all whom it may concern:

Be it known that I, EDWARD F. G. GIBBS, a citizen of the United States, residing at Washington, District of Columbia, have invented certain new and useful Improvements in Fire-Escapes; 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, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to new and useful improvements in fire escapes, of which the following is a specification.

The object of this invention is to provide a complete fire escape system and parts appurtenant thereto which will not only furnish safe, simple and accessible means of escape from a burning building, but improve on the present means as an aid to the first discoverer of the fire and firemen in readily entering a locked and burning building, rescuing the disabled and in fighting the fire and protect itself against deterioration by exposure to the weather.

To this end, I have designed the centrifugally regulated friction brake, endless cable machine and parts appurtenant thereto, illustrated in the accompanying drawings, which form a part of this specification and in which drawings:—

Figure 1 is a sectional view through my fire-escape apparatus and showing an extensible ladder locked in a closed relation. Fig. 2 is a detail view, in side elevation, of a friction shoe. Fig. 3 is a detail view of a spring which serves to normally hold the shoe out of engagement from frictional contact with a stationary friction rib. Fig. 4 is a detail view of a collar support against which the spring is adapted to bear. Fig. 5 is a top plan view of a chain-box bottom. Fig. 6 is a sectional view through the chain-box bottom showing, in dotted lines, the position the chain assumes when rewound within the chain-box. Fig. 7 is a face view of an attachment to the extensible portion of the ladder. Fig. 8 is a side elevation of the detail shown in Fig. 7. Fig. 9 is a detail view of a split clamp which is connected to the extensible portion of the ladder and adapted to frictionally engage the trip wire of the fire-

escape, and Fig. 10 is a front elevation of the assembled housing arrangement.

Reference now being had to the details of the drawings by letter, A designates a bracket member which is adapted to be fastened by any suitable means, as by a bolt B to a wall of a building, and has two projecting arms C having bearing members C' at the ends thereof in which a hollow shaft D is mounted, being held by means of set-screws D'. Said hollow shaft had journaled therein a shaft E which is held in place within the hollow shaft by means of a set-screw in the hub E' at one end of the shaft and a sprocket wheel F at the other end, which sprocket wheel is fixed to rotate with said shaft.

G designates the fixed male member of the housing arrangement which is called the friction box, and has an inturned horizontally disposed flange G', from which an annular vertically disposed friction rib or flange G² projects far enough to allow any accumulated rust, dust, or cuttings to fall out of the way of the friction brake shoes H, shown in Fig. 2, and whose vertical faces are angular with respect to each other and adapted to engage frictionally the angular walls of the groove in the said brake shoe, all of which is shown in Fig. 1. Said sprocket wheel has a flange F' upon its one side serving as a guard to prevent the chain from coming off the wheel, and on its other side is the flange F² having lugs F³ which are apertured to receive the arms F⁴ which are fixed to said lugs, said sprocket wheel, flanges and lugs being integral.

J designates a collar which is fixed to each of said arms and upon which arms the shoes H are mounted by means of the end of the arm engaging a recessed aperture h formed in the shoe. Each of said shoes carries within its recess a spring I adapted to bear between the bottom of said recess h and a collar support I', a detail of which is shown in Fig. 4 of the drawings, said spring serving to normally hold the shoe in which it is mounted from engagement with the annular frictional rib G², having the angular faces which have been described. In the drawings, there are shown two of said friction shoes diametrically disposed and adapted to be thrown by centrifugal force against the annular rib G², whereby the speed of the rotating shaft may be regulated.

K designates the female member of the housing arrangement which is called the

housing and has an intumed horizontally disposed flange K', which snugly telescopes or incases the friction box, and has preferably an angular abutment K², as shown in Fig. 1, for the purpose of insuring a water-tight joint. Subjoined to the lower portion of the housing and integral therewith is the mouth-piece K³ and an opening K⁴ in the lower periphery of the housing opens the way for the chain to pass through to the sprocket wheel. The said housing is held by bolts K⁵ to the said friction box which is mounted upon the hollow shaft D. To the lower portion of said mouth-piece is securely attached the cylindrical chain-box or storage apartment N, the third member of the housing arrangement, the axial center of which is at or near a right angle to that of the housing K, and in which the chain or cable of the fire-escape is adapted to be housed. Said chain-box N has a movable or falling bottom N', the fourth and last member of the housing arrangement, which fits loosely within the open lower end of the chain-box and is held by the trip pin P' and, being weighted by the chain, it readily falls when released. An arresting rope or chain O is secured to said member N' and its other end fastened to a spring supported pin O' which is mounted in an apertured lug n integral with the housing K, said pin being made spring-actuated in order to take up the jar incident to the falling of the bottom N'.

The escape chain Q, which is endless, passes over said sprocket wheel and is normally stored in the manner shown in Fig. 1 of the drawings, within the chain-box and supported by said chain-box bottom.

Pivotally mounted upon a pin P held by a lug upon the side of said chain-box is a trip pin P', the lower free end of which is angled and is adapted to pass through an opening R in the lower portion of the chain-box and to form a support for said bottom N'. A releasing trip wire R' is fastened to said trip pin P' and passes over the protected pulley R² and is adapted to extend down adjacent to the windows of the building to the ground within convenient reach of the person who may operate the same to release the escape chain.

Mounted upon the side of the building is an extensible or movable ladder made up preferably of two sections L and L' which are held in sliding relation with each other by means of straps L², one of which is shown in elevation in Fig. 1 of the drawings. A pulley L³ is journaled upon the section L of the ladder, and a rope L⁴ passes over said pulley and has a weight L⁵ secured to one end while its other end is fastened to the upper part of the lower section of the ladder, the purpose of said weighted rope being to counter-balance the weight of the extensible portion L' of the ladder. At any suitable location upon the ladder, a hook member L⁶ is fastened, a detail of which hook member is shown in Figs.

7 and 8 of the drawings, and around which a strand of the escape chain Q is adapted to be thrown and caught when it is desired to pull down the extensible portion of the ladder, it being understood that the ladder is normally held, when not in use, in the position shown in Fig. 1 of the drawings.

Fastened to the extensible portion of the ladder is an eye M having a wire M' fastened thereto and to which wire a split-clamp M² is fastened and which is adapted to engage frictionally the trip wire R'. The object of this feature is to force a burglar, who may attempt to pull down the extensible ladder with a pole or other means, to pull the trip wire also, which causes the chain to fall, giving the alarm by the loud rattling noise of the falling chain.

Fixed to the shaft E is a sheave E⁴ about which an endless chain E⁵ works which is utilized for the purpose of rotating the shaft E to rewind the chain within the chain-box. In taking up or housing the chain in the chain-box, both strands of the chain are first placed, one in the slot N⁴ in the upper edge of the wall and the other in the cavity N⁵ of the chain-box bottom shown in Fig. 5. It is then slipped up into the chain-box in the manner shown in Fig. 1. It will be seen that one link N³ may be placed in the constricted slot N⁴ through which it cannot pass, or engaged and held by other means, while through the opposite cavity N⁵ it will pass freely to and over the sprocket wheel and accumulate in a pile in the chain-box as shown in Fig. 1 of the drawings, by the rotary movement of the shaft E. It will be noted that when the chain is entirely wound up, a portion thereof will assume the position shown in Fig. 6 of the drawings, which will be entirely housed and out of reach of the elements, thus preventing corrosion of the chain. This result is attained by the deep channel or depression N² across the bottom of the chain-box bottom, which depression terminates at one end with the slot N⁴ and cavity N⁵ at the other.

In operation, when it is desired to release the escape chain, the operator, by pulling down upon the trip wire R', will cause the trip pin P' to be released from the chain-box bottom N' and the latter which supports the chain within the chain-box, will fall by gravity until arrested by the arresting chain or rope O, while the escape chain Q will fall, in suspended position, nearly to the ground. One strand of the chain, after falling from the box, may be thrown around the hook L⁶ and, by pulling down upon the chain, the extensible portion of the ladder may be drawn down, thereby affording means whereby firemen and other persons may enter the building. The angular shape of the forked part of the hook L⁶ does not permit the ascending strand of the chain to engage it, if one comes

down on the chain before the lower section of the ladder is drawn down. A person to be lowered by the escape chain may have a belt or chain of any suitable kind placed about his or her body and caught in the links of the escape chain Q. The weight of the person thus secured upon the chain will cause the sprocket wheel to rotate rapidly and the centrifugal force due to the rapid rotary movement of the said sprocket-wheel will be sufficient to overcome the tension of the springs, at a moderate speed, and cause the friction shoes H to be thrown out and engage the fixed friction rib G², thus serving as an automatic means for regulating the descent. After the person has reached the ground, the centrifugal force will be destroyed by the slackening up of the rapid rotary movement of the sprocket wheel, and the springs I will cause the shoes to be returned to their normal positions which will be out of contact with the friction rib G², thus allowing the sprocket wheel to rotate freely, at a moderate speed, without friction from the shoes when it is desired to use the machine as a hoist.

From the foregoing, it is seen that a waterproof housing arrangement is provided for the chain and all the working parts of the device, which is well adapted to lowering persons and to hoisting the fireman's hose as well and which, combined with the extensible ladder as shown, affords the ready means of entering a locked and burning building to awaken the sleeping inmates, which is often the first essential in the work of rescue. This unique arrangement enables the unaided first discoverer of the fire to pull the trip wire, which lets the chain fall into a suspended position, and with it he hauls down the ladder from which he enters the building, while for the would-be burglar the loud rattling noise of the falling chain is an alarm, and if he attempts to pull down the ladder with a pole, the split-clamp pulls the trip wire also which lets the chain fall, giving the alarm. The value of this combination is further seen in considering the fact that, while an automatically regulated endless chain escape is economical in space and cost, safe and rapid in lowering persons, although they be unconscious, it is impracticable for an unaided person or for a large number of firemen to enter a building at one time from it and, while the ladder is adequate for firemen and athletes, it is very hazardous for women, children and the aged, nor is it safe for a fireman to descend with an unconscious person, consequently the value of the combination.

What I claim is:—

1. In a fire-escape machine, the combination of a fixed member, as G, having an annular surface adapted to frictional engagement, a sprocket wheel, an endless chain or cable passing over the said wheel, an arm project-

ing from the said wheel, a friction brake shoe carried by the said arm and having at its periphery a bearing surface adapted to frictional engagement with the said fixed member and a spring external to the said arm and internal to the said brake shoe, which holds the said shoe out of engagement with the said fixed member until overcome by the centrifugal force due to the rapid rotation of the said sprocket wheel, substantially as set forth.

2. In a fire-escape machine, the combination of a fixed member, as G, having an annular bearing surface adapted to frictional engagement, which projects radially therefrom and serves to expel particles of dust, rust and cuttings, a sprocket wheel, an endless chain or cable passing over the said wheel, an arm projecting from the said wheel, a friction brake shoe carried by the said arm and having at its periphery a bearing surface adapted to frictional engagement with the said fixed member and a spring external to the said arm and internal to the said brake shoe which holds the said shoe out of engagement with the said fixed member until overcome by the centrifugal force due to the rapid rotation of the said sprocket wheel, substantially as set forth.

3. In a fire-escape machine, the combination of a fixed member, as G, having a projecting annular vertically disposed friction rib, as G², with angular bearing surfaces, a sprocket wheel, an endless chain or cable passing over the said wheel, an arm projecting from the said wheel, a friction brake shoe carried by the said arm, having at its periphery a groove with bearing surfaces adapted to frictional engagement with the said friction rib and a spring which holds the said shoe out of engagement with the said rib until overcome by the centrifugal force due to the rapid rotation of the said sprocket wheel, substantially as set forth.

4. In a fire escape, the combination with a hollow shaft, a housing supported upon said hollow shaft, a solid shaft journaled in said hollow shaft, a sprocket wheel fixed to the inner end of said solid shaft, an endless chain passing about said wheel, means for rotating said sprocket wheel whereby said chain may be raised, a chain box connected to said housing, a removable bottom to said box and adapted to support the chain, a support for the bottom, and means for releasing said bottom, as set forth.

5. As an article of manufacture, a male member of a housing arrangement having an internal horizontally disposed flange from which flange projects an annular radially disposed rib, whose faces are angular to each other and adapted to frictional engagement, substantially as set forth.

6. As an article of manufacture a chain box, a movable chain box bottom therefor,

having the means of engaging and holding one strand of an endless chain or cable and an opening through which the other strand of the said chain may pass up freely when the said bottom is in its normal position at the lower part of a chain box to which it is adapted, substantially as set forth.

7. In an endless cable machine, the combination of a fixed male member of the housing arrangement having an internal horizontally disposed flange, a female housing member having an external horizontally disposed flange which is adapted to telescope or incase the said male member and an internal opening through the lower portion of its periphery through which opening a chain is adapted to pass, a chain box attached to the lower portion of the said female housing member whose axial center is at or near a right angle to that of the said female member, and a movable chain box bottom having the means for engaging and holding one strand of an endless chain and a cavity through which the said endless chain may be drawn up into the said chain box when the said bottom is in its normal position at the lower end of the said chain box, substantially as set forth.

8. In an endless chain machine, the combination of a sprocket wheel, an endless cable or chain, a housing arrangement having a movable bottom which bottom is provided with means for engaging and holding one strand of the said cable or chain and an open cavity through which the other strand may pass freely up over the said wheel and be deposited in the said housing arrangement, substantially as set forth.

9. In an endless chain machine, the combination of an endless chain, a housing arrangement having a movable bottom provided with means for engaging and holding one strand of the said endless chain, an open cavity through which the other strand may pass freely and a channel across its bottom into which the short externally remaining portion of the chain may be drawn up and housed when the greater part of it is housed

within the said housing arrangement, substantially as set forth.

10. In an endless chain machine the combination of an endless chain, a housing arrangement having a movable bottom provided with means for engaging and holding one strand of the said endless chain and a cavity through which the other strand may pass freely and a tripping mechanism, the displacing of which allows the said chain to fall into a suspended position, substantially as set forth.

11. In a fire-escape system, the combination of a building, a chain housing arrangement attached thereto, a revoluble support inclosed in the said housing arrangement, an endless chain passing over the said support, a movable bottom attached to the said housing arrangement, the displacing of which allows the said chain to fall into a suspended working position, a movable ladder attached to the said building and means attached to the said ladder for engaging and holding the said chain by which the said ladder may be raised and lowered, substantially as set forth.

12. In a fire-escape system, the combination of a building, a chain housing arrangement attached thereto, a sprocket wheel inclosed in the said housing arrangement, an endless chain passing over the said wheel, a detachable chain box bottom attached to the said housing arrangement, a tripping mechanism, the operation of which causes the chain to fall, an extensible ladder attached to the said building and means of attaching the said ladder to the said tripping mechanism to the end that the said chain will fall automatically with hauling down of the ladder for the purpose of sounding an alarm, substantially as set forth.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

EDWARD F. G. GIBBS.

Witnesses:

A. L. HOUGH,
FRANKLIN A. HOUGH.