

No. 849,221.

PATENTED APR. 2, 1907.

F. G. ENGEL.
AUTOMATIC FIRE ESCAPE MACHINE.

APPLICATION FILED DEC. 2, 1905.

3 SHEETS—SHEET 1.

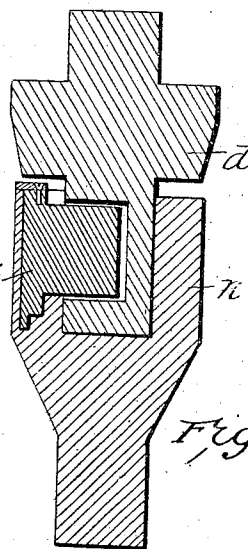
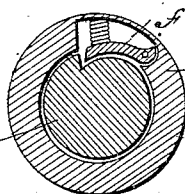
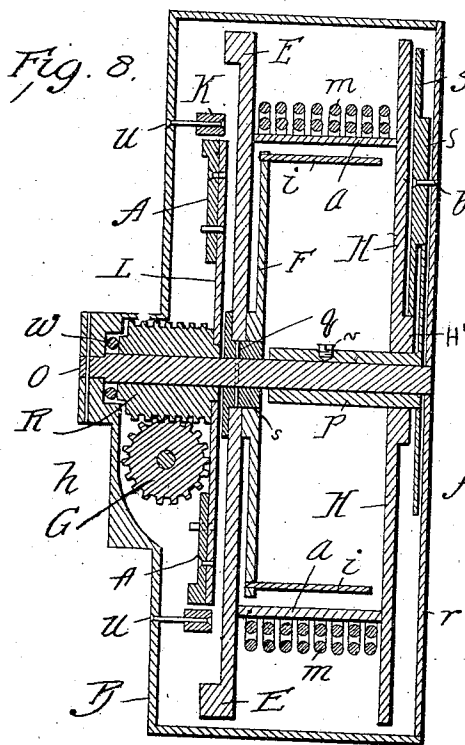
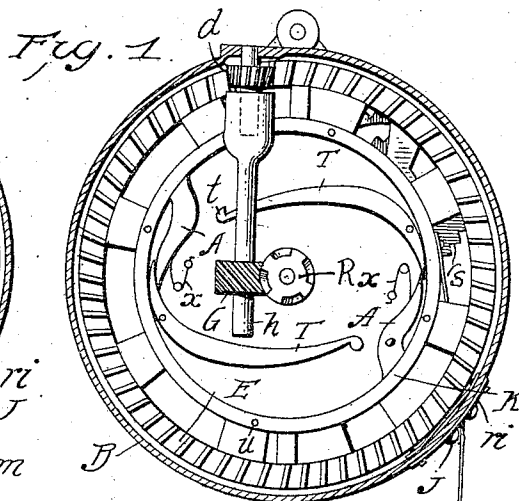
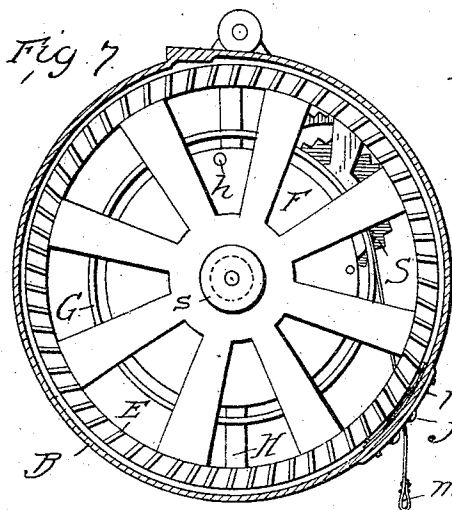


Fig. 16

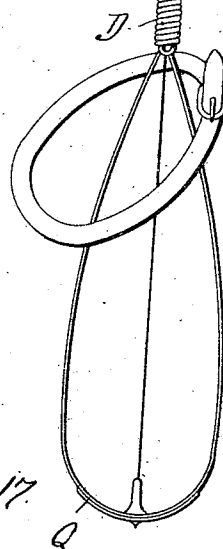


Fig. 17

Attest:

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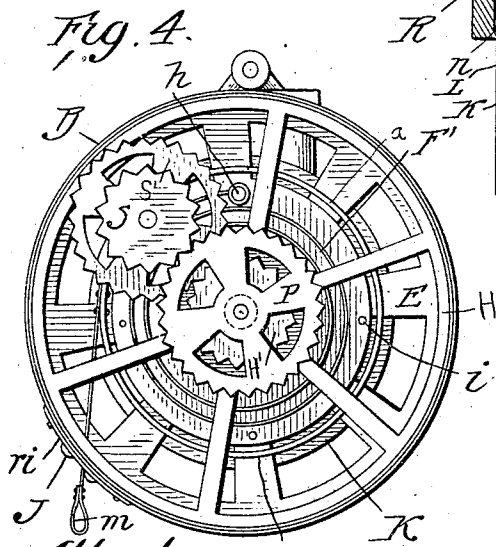
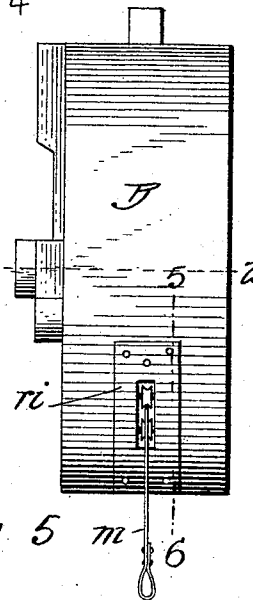
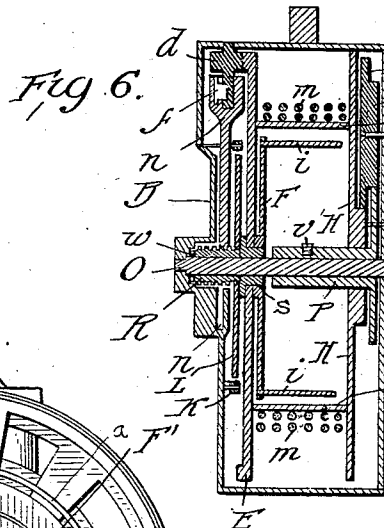
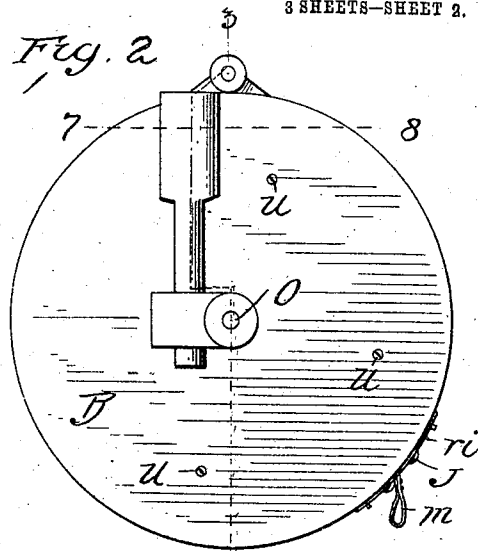
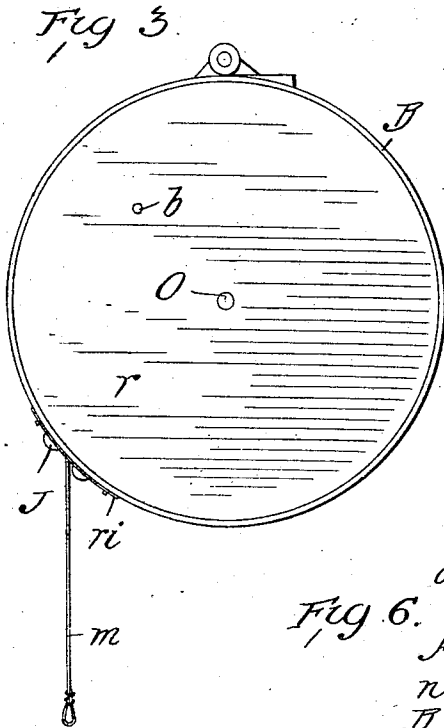
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3 SHEETS—SHEET 2.



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S. B. Middleton
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3 SHEETS—SHEET 3.

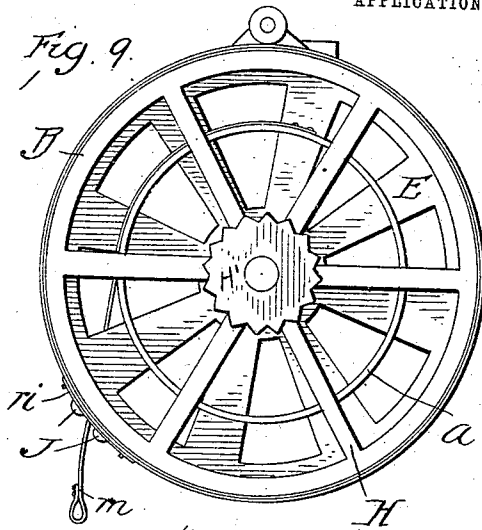


Fig. 15

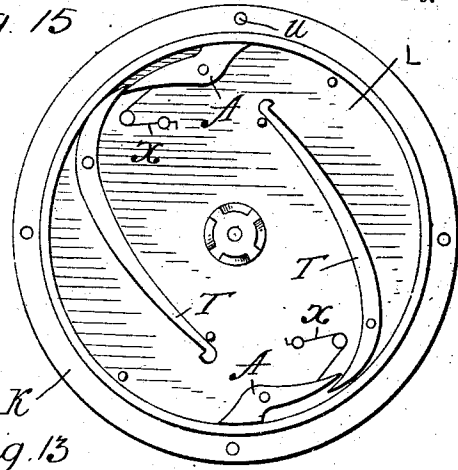


Fig. 10.

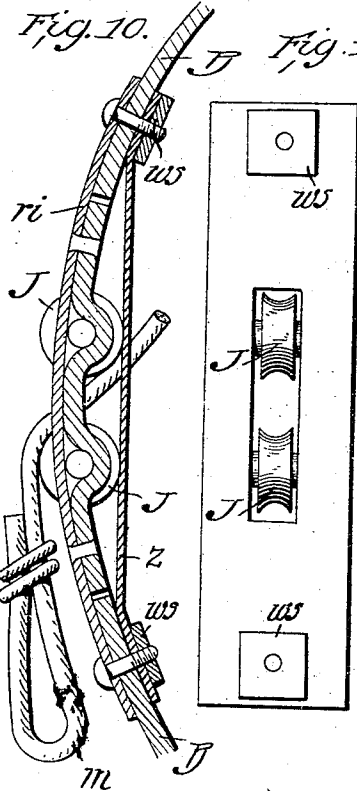


Fig. 11.

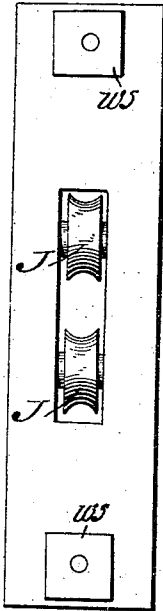


Fig. 13

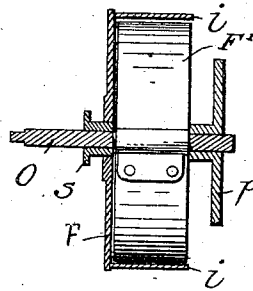


Fig. 14

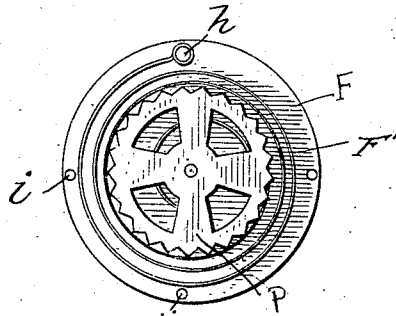
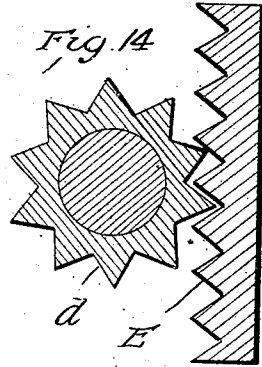


Fig. 12.

Attest:

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UNITED STATES PATENT OFFICE.

FREDERICK G. ENGEL, OF NEW YORK, N. Y.

AUTOMATIC FIRE-ESCAPE MACHINE.

No. 849,221.

Specification of Letters Patent.

Patented April 2, 1907.

Application filed December 2, 1905. Serial No. 290,046.

To all whom it may concern:

Be it known that I, FREDERICK G. ENGEL, a citizen of the United States, residing at No. 552 Lenox avenue, in the borough of Manhattan, city, county, and State of New York, have invented a new and useful Automatic Fire-Escape Machine of which the following is a specification.

My invention relates to a fire-escape machine which can be secured within buildings, from which machine a wire cable unwinds from a drum in said machine, which lowers a person down attached to said cable automatically to the ground. After the cable is detached from the person the drum in said machine automatically winds up the said cable again for repetition of lowering other people. I attained these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a front view of a vertical section of a part of the machine with a part D Q. All other views are without the part D Q. Fig. 2 is a front view of the machine. Fig. 3 is a back view of the machine. Fig. 4 is a back view of the machine after cover *r* has been removed. Fig. 5 is a side view of the machine. Fig. 6 is a vertical section of a part of the machine on the line 3 4, Fig. 2. Fig. 7 is a front view of a vertical section of the machine after the worm-gear-supporting disk with levers, together with the cog-wheel running into said worm-gear, the shaft of said cog-wheel, and the cog-wheel running into said shaft, have been removed. Fig. 8 is a vertical section of a part of the machine as it appears after the spring has been removed on the line 1 2, Fig. 5. Fig. 9 is a back view of the machine as it appears after all parts have been removed but the drum and supporting-wheels and wire cable. Fig. 10 is a vertical section of a part of the machine as it appears on the line 5 6, Fig. 5. Fig. 11 is a front view of a part of Fig. 10, represented by the letter *z*. Fig. 12 is a vertical view of the disk, spring, and cog-wheel, represented in Fig. 4 by the letters F, F', and P. Fig. 13 is a sectional view of a part of the machine on the line 1 2, Fig. 5. Fig. 14 is a sectional view of a part of the machine on the line 7 8, Fig. 2. Fig. 15 is a vertical view, represented in Fig. 1 by L K. Fig. 16 is a horizontal section of cog-wheel *d* and shaft

end represented in Fig. 1. Fig. 17 is a vertical section of cog-wheel *d* and shaft end represented in Fig. 1.

Similar letters refer to similar parts throughout the several views.

The shell B represents the main casting and with *r* constitutes the framework of the machine. The shaft O, which is secured to the framework of the machine B and *r*, acts as a shaft for the worm-gear R, the bushing *s*, and the cog-wheel P. The disk or plate L is secured to one end of the worm-gear R and rotates with R, Fig. 8. The levers T T and A A are fastened and connected by springs to the plate or disk L. The ring K is secured to the framework of the machine by set-screws *u u* in Fig. 1.

As the disk or plate L rotates the ends of the levers T T at *t t* are thrown out by centrifugal force toward the circumference of the disk or plate L. At the same time the other ends of the levers T T press against one end of the levers A A, causing the other ends of the levers A A to press against the inner side of the ring K, and the levers are returned to normal position when the disk or plate is not in rotation by the springs *x*, Fig. 1, and detail view, Fig. 15.

The balls W W are between the framework B and one end of the worm-gear R to facilitate the rotation of the worm-gear R, as represented in Fig. 8.

The bushing *s* is secured to the shaft O by the pin *g*, Fig. 8.

E is a large cog-wheel which rotates on the bushing *s*.

H is a wheel which rotates on the shaft of the cog-wheel P, Fig. 4.

H' is a gear forming part of wheel H.

F is a plate riveted to one end of the bushing *s*, Fig. 8.

i i are rods riveted to the plate F, Fig. 8.

a is a drum, one side secured to the side of the cog-wheel E, and the other side of said drum is attached to the side of the wheel H. *m* is a wire cable which is wound around the drum *a* between the sides of the cog-wheel E and the side of the wheel H, Fig. 8 and Fig. 6.

S S' is a double cog-wheel revolving on the shaft *b*. The shaft *b* is attached to the framework *r*, Fig. 8.

The drum *a*, together with the cog-wheel

E and the wheel H, is rotated by a system of gearing represented by the cog-wheels P and H' and the double cog-wheel S, Fig. 8 and Fig. 4, said system of gearing deriving its movement from the spring F', secured to the cog-wheel P by the screw *v* and to the plate F by the hereinafter-described means.

One end of the cable is attached to the drum *a*, as in Fig. 4. The small cog-wheel *d* runs into the large cog-wheel E, Fig. 1 and Fig. 6. The shaft of the small cog-wheel *d* runs into the socket *n'* in the end of shaft *n*, Fig. 16 and Fig. 6. Said socket is provided with a pawl *f*, arranged to fit in a groove in the shaft of said cog-wheel *d* and commonly termed an "escapement," so that when the said cog-wheel *d* is rotated in one direction it rotates said shaft *n*, and when the said cog-wheel *d* is rotated in the opposite direction said cog-wheel revolves without revolving the said shaft *n*.

G is a worm secured to the shaft *n* and gears into the worm-gear R, Fig. 8 and Fig. 1.

As the wire cable *m* is unwound from the drum *a* said drum rotates, Fig. 6, causing the large cog-wheel E, gearing into the small cog-wheel *d*, to rotate on the bushing *s* and the wheel H to rotate on P, Fig. 6. The rotation of the large cog-wheel E when the cable is being unwound from the drum *a* causes the smaller cog-wheel *d* to rotate, together with the shaft *n*, said shaft *n* causing the worm G, gearing into the worm-gear R, to revolve. As said worm G revolves it revolves the worm-gear R, together with the plate L, which causes the levers T T and A A to be pressed against the inside surface of the ring K.

One end of the spring F' is attached to the rod *h*, Figs. 4 and 12. Said rod is riveted to the plate or disk F, Fig. 7, so that when the weight of the person is attached to the cable *m* the said cable *m* is unwound from the drum *a* and the wheel H revolves, whereby the cog H' gears into the double cog-wheel S S' and said double cog-wheel S S' gears into the cog-wheel P, the shaft of said cog-wheel P, acting as an arbor for the spring F', causing said spring F' to be wound on said arbor P. When the weight of the person is detached from the cable *m*, the spring F' causes the cog-wheels to revolve the drum *a*, winding up said cable M, Fig. 4. Attached to the end of cable *m* is a spiral spring D, said spring acting to take

up sudden jolt when the weight of a person is being suspended from the cable *m*.

Q is a contrivance to securely hold and fasten a person to the wire cable *m* and is shown to illustrate, but forms no part of, the invention.

The plate *ri* is fastened to the framework B, Fig. 10. Plate *ri* is provided with the wheels J J, said wheels supporting the cable *m* in passing through the framework B, Fig. 10. Cable *m* is guided to the wheels J J by a plate Z, having an oblong orifice and fastened to B by the thumb-screws *ws*, Figs. 10 and 11.

I claim—

1. A fire-escape device comprising a casing, a drum therein, a cable wound on said drum, a carrier at the free end of the cable, a ring on the casing, a plate, levers carried by said plate and having frictional contact with the ring on the rotation of said plate, a worm-gear connected to said plate, a cog-wheel connected to the drum, a shaft, a worm at one end thereof, engaging with the worm-gear connected to the plate, a second gear-wheel loosely mounted on said shaft and engaging with the cog-wheel connected to the drum and a pawl for imparting the movement of said loosely-mounted worm-wheel to the shaft when said wheel rotates in one direction, substantially as described.

2. A fire-escape device comprising a casing, a shaft held therein, a worm-gear R rotatably mounted on said shaft, a plate connected to said worm-gear R, levers carried by said plate, a ring K with which the levers have frictional contact on the rotation of said plate, a drum, rotating about the said shaft, a cable wound on said drum, a cog-wheel on said drum, a shaft, a gear-wheel *d* loosely mounted on said shaft, said wheel engaging with the cog-wheel on the drum, a pawl for imparting the rotation of the wheel *d* to the shaft when said wheel rotates in one direction, a worm G at the other end of the shaft engaging with the worm-gear R, a gear P having its hub surrounding the shaft, gears connecting said gear with the drum, and a spring located within the drum and having one end connected to the hub of the gear and its other end to a stationary part of the casing, substantially as described.

FRED. G. ENGEL.

Witnesses:

CHARLES J. ENGEL,
ARTHUR ENGEL.