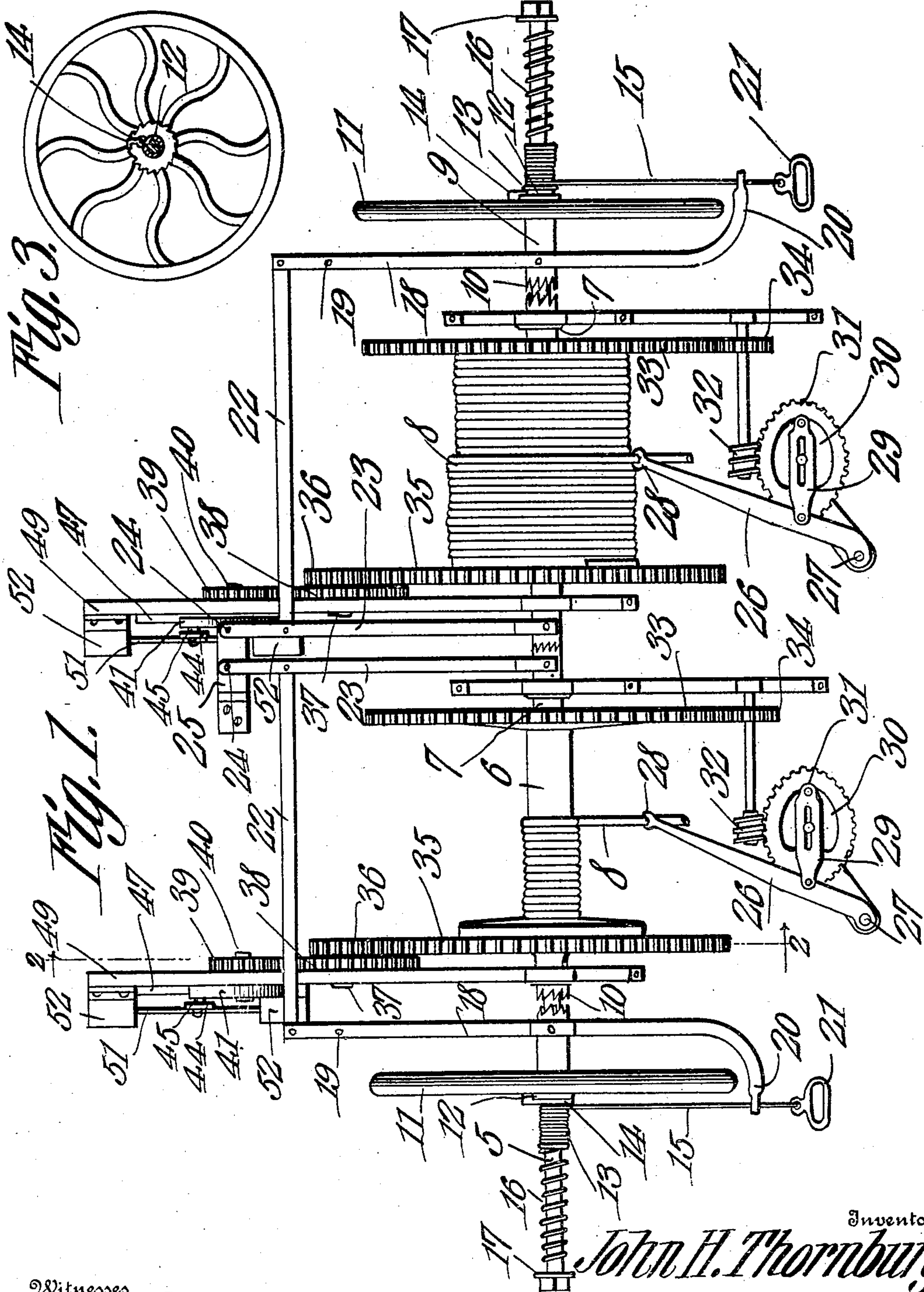


J. H. THORNBURG.
FIRE ESCAPE.
APPLICATION FILED JAN. 25, 1909.

936,385.

Patented Oct. 12, 1909.

2 SHEETS—SHEET 1.



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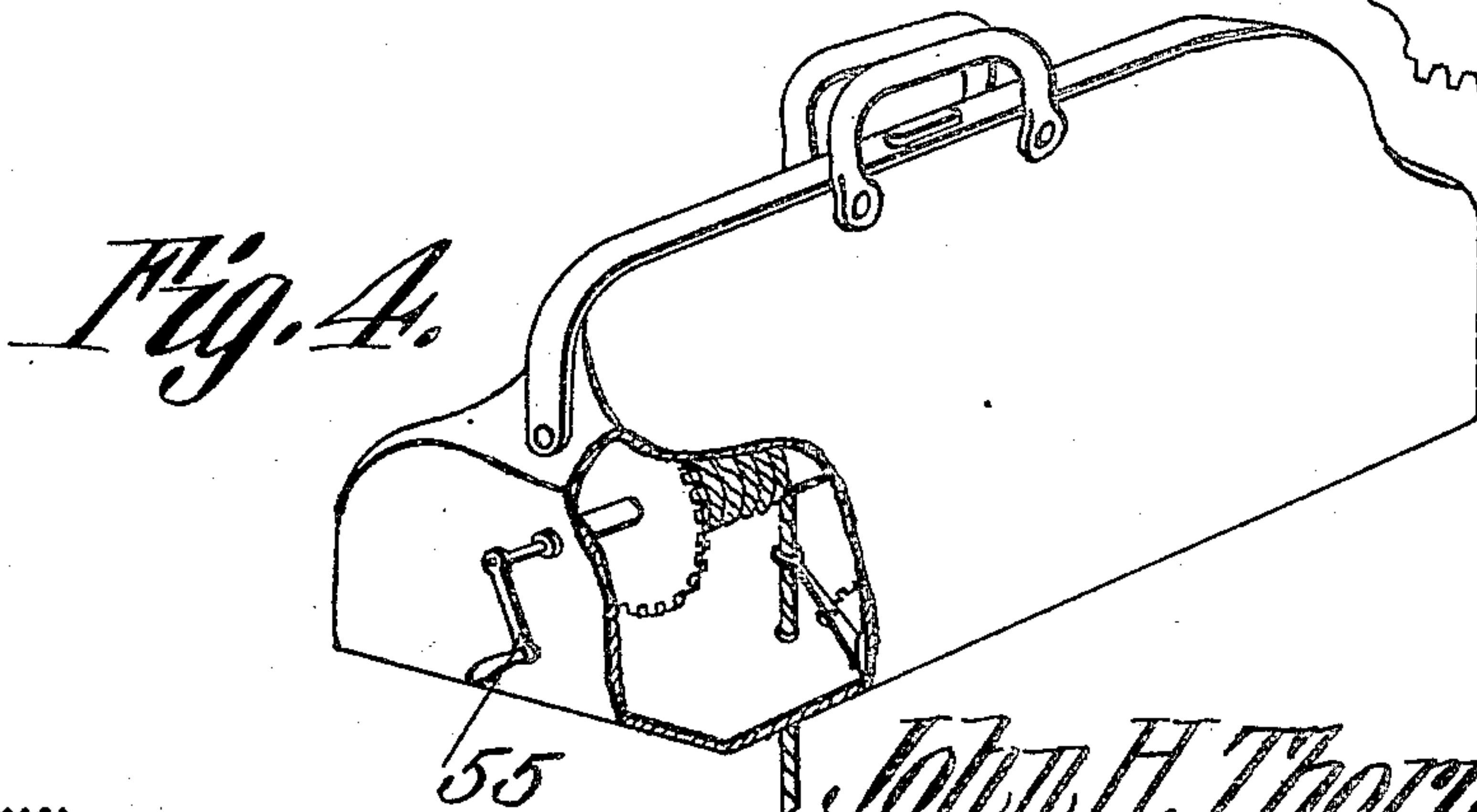
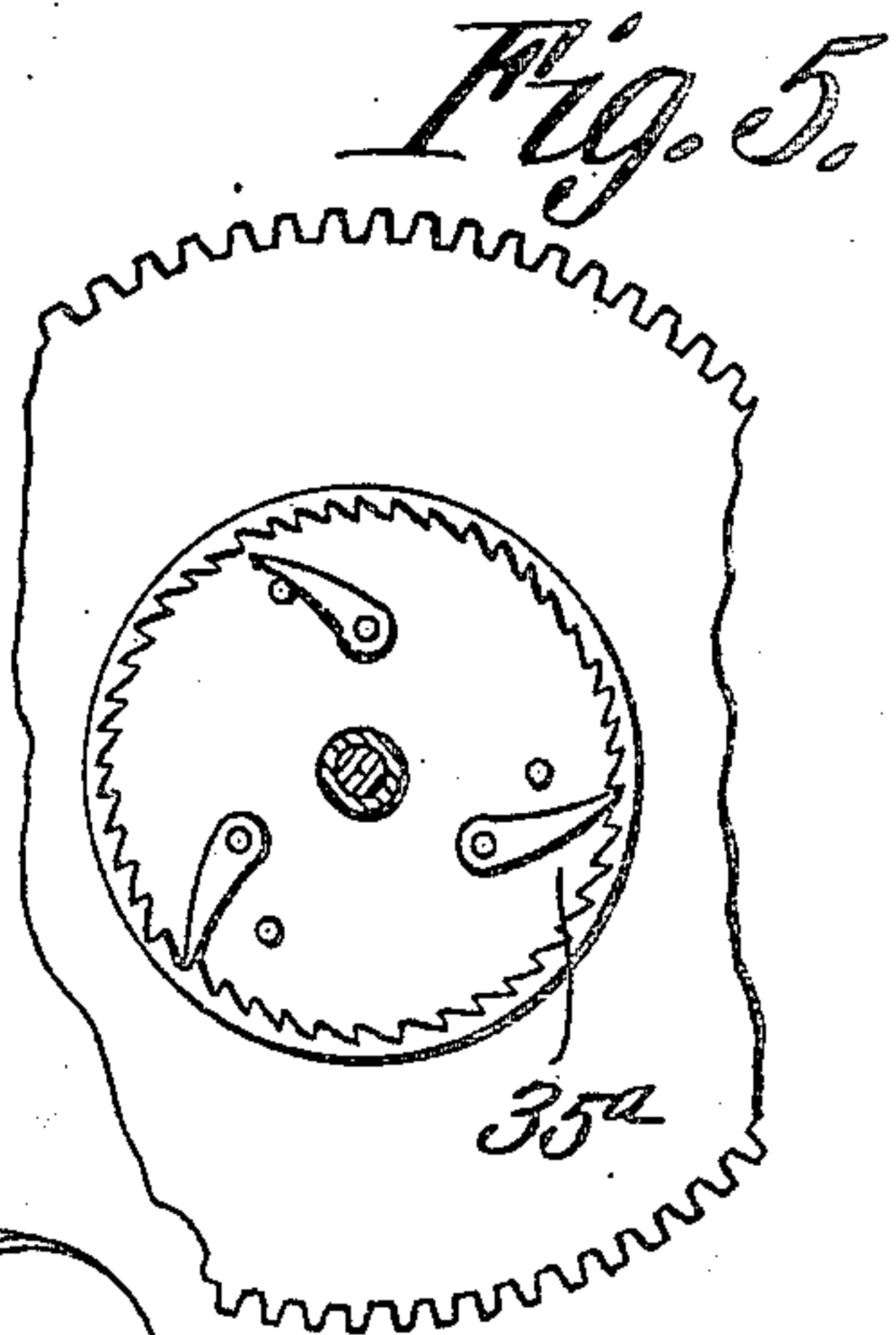
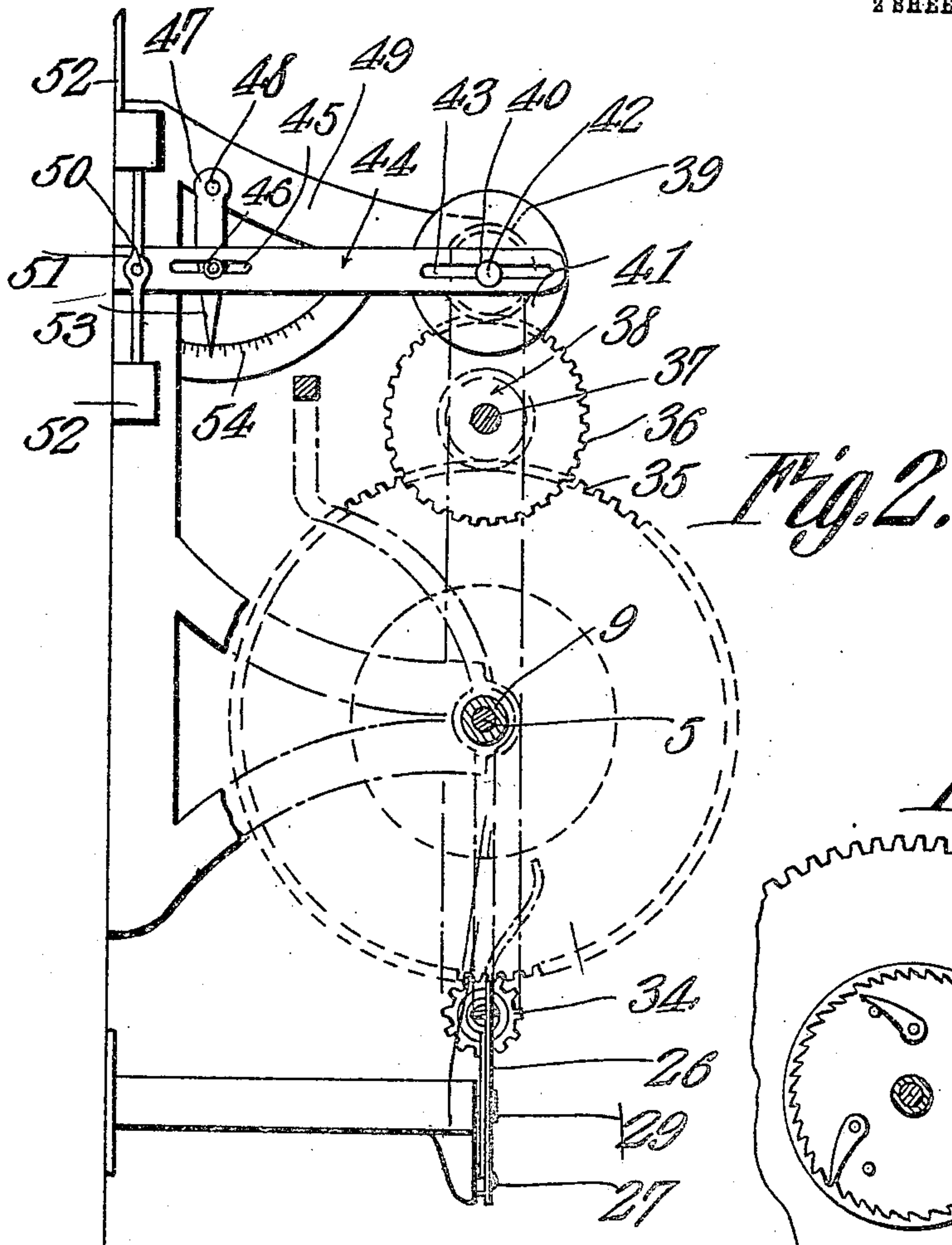
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UNITED STATES PATENT OFFICE.

JOHN H. THORNBURG, OF KNIGHTSTOWN, INDIANA.

FIRE-ESCAPE.

936,385.

Specification of Letters Patent.

Patented Oct. 12, 1909.

Application filed January 25, 1909. Serial No. 474,110.

To all whom it may concern:

Be it known that I, JOHN H. THORNBURG, a citizen of the United States, residing at Knightstown, in the county of Henry and State of Indiana, have invented a new and useful Fire-Escape, of which the following is a specification.

It is the primary object of my invention to provide a fire escape which will occupy but little space when not in use, and which will permit the gradual descent, from any floor of a building, of a person employing the device as a fire escape.

One of the novel features of the device resides in the provision of an adjustable controlling means for limiting the speed of rotation of the cable drums of the device, so that the device may be adjusted for persons of different weights, and for use at various elevations.

My invention also embodies re-winding mechanism, by means of which the cable may be quickly re-wound upon the drum of the device, so that a number of persons may use the device, if necessary, in a short time; and the device is so arranged that when the re-winding mechanism is being operated, the retarding mechanism will be thrown out of operation, so that practically no resistance will be offered to the re-winding of the cable, the retarding mechanism being, however, instantly thrown into operation upon the stopping of the re-winding mechanism.

Other novel features of the invention will appear in the course of the specific description which is to follow, and in the drawings, in which—

Figure 1 is a view in elevation of a fire escape embodying my invention, the construction shown in the figure being that designed for use on tall buildings, where a number of persons might have occasion to use the device in a short time. Fig. 2 is a vertical sectional view on the line 2—2 Fig. 1, showing a portion of the mechanism in side elevation. Fig. 3 is a detail side elevation of the fly-wheel of the mechanism, and Fig. 4 is a detail perspective view of a satchel showing the manner in which a modified form of my invention may be arranged for use, the mechanism in this form or embodiment of the invention being single in character, whereas the mechanism illustrated in the other figures of the drawings is double in character. Fig. 5 is a detail

view of the pawl and ratchet clutch between the drum and the gear at one end thereof.

It will be understood that the mechanism embodying my invention may be housed in any suitable manner, as in a casing, or supported by a crane or track mounted upon the wall of a building, and, for this reason, the mechanism itself will alone be described.

In the drawings the shaft of the device is indicated by the numeral 5, and loosely mounted upon the shaft is a pair of winding drums 6, said drums being provided at each end with a hub portion 7, which has a clutch end. Normally the clutch ends of the opposing hubs of each drum are in mutual engagement, so that the drums are clutched for simultaneous rotation, and, if preferable, the cable, which is indicated by the numeral 8, may be wound upon the drums in such manner that when one drum is unwinding, the cable of the other drum will be wound thereon. In other words, the cables 8 are so arranged upon the drums as to alternately unwind, so that while a person is being lowered by the unwinding of one cable from a drum, the cable of the other drum is being wound up to permit the descent of another person, it being understood that the cables may be independently re-wound whenever desired.

Mounted loosely upon the shaft 5 and outwardly from each drum 6 is a sleeve 9, provided with an end 10 of clutch formation, which is adapted to engage and lock with the corresponding end of the other hub of the corresponding drum 6, and fixed upon each sleeve for rotation therewith is a fly-wheel 11 provided with a ratchet 12. A spool 13 is also loosely mounted upon the shaft 5, which spool carries a pawl 14, which, when the spool is rotated in one direction upon the shaft, engages with the ratchet 12, and provided for rotation of the fly-wheel 11, rotation of the spool in the opposite direction having no effect on the said fly-wheel. A cable 15 is connected with and wound upon each of the said spools 13 and by pulling down on the cable to unwind the same from the spool, the pawl will engage, with the ratchet and the corresponding fly-wheel will be rotated.

In order to restore the mechanism to normal position after the rope 15 has been unwound from the spool, a spring 16 is engaged upon the shaft, and is connected at

one end to the corresponding spool 13, and at its other end to a collar 17, fixed upon the adjacent end of the shaft, it being understood that as the cable 15 is unwound from the spool, the spring is placed under tension; upon releasing the cable, the spring will act to rotate the spool and re-wind the cable thereon. It will thus be seen that by repeatedly pulling on the cable 15, continuous rotation of the fly-wheel 11 will be secured, and the corresponding drum 6 will be rotated to re-wind the cable 8 thereon.

A lever 18 pivoted adjacent each drum 6 is also pivotally connected with the hub or sleeve 9 of the corresponding fly-wheel, it being understood that each fly-wheel sleeve carries one of these levers. The lower end of each of the levers 18 is turned laterally at 20, and is formed with an eye, through which passes the corresponding cable 15, the cable being provided at its lower end with a handle 21, which is grasped for the purpose of unwinding the cable from the spool, and setting the fly-wheel 11 in motion. As will appear from the drawings, when the cable 15 is being unwound from the spool, the sleeve 9 will be clutched with the hub of the corresponding drum 6, but when the cable is released and is rewound upon the spool 13, the handle 21 will strike the lower laterally turned end of the lever 18 and will swing this lever upon its pivot 19, and withdraw the clutch end of the sleeve 9 from engagement with the clutch end of the hub of the corresponding drum 6. To the extreme upper end of each of the levers 18 is connected one end of a bar or rod 22, the other end of each of these bars 22 is connected pivotally to an arm 23, which is pivoted at its upper end as at 24 to a bracket 25, the lower end of the said arm 23 being pivotally connected to the inner or opposed ends of the hubs of the winding drums 6. When the handle 21 of one of the cables 15 strikes the lower end of the corresponding lever 18 it swings said lever upon its pivot 19, and the upper end of the lever will move in the direction of the corresponding arm 23, and rock the said arm 23 to shift the corresponding drum, and in this manner clutch the drums for simultaneous rotation.

In order that the cables 8 may be evenly distributed upon the drums 6 when wound thereon, an arm 26 is pivoted as at 27 below each of the drums 6, and is provided at its upper end with an eye 28, through which the corresponding cable is threaded. This arm has pivoted to it a slide 29, which works over the cam face 30 of a gear 31, said gear being driven from a worm 32, which meshes therewith, and which, in turn, is driven from one head of the drum 6, it being understood that the drum heads are of gear formation. The head just mentioned is indicated by the numeral 33, and meshes with a pinion 34

upon the worm-shaft. It will be understood from the foregoing that as either of the drums 6 rotates motion will be imparted to the corresponding gear 31 and the cam face of this gear will act to reciprocate the slide 29, and oscillate the arm 26, feeding the eye end of the arm across the corresponding drum, and evenly distributing the cable thereon.

The means for retarding the speed of rotation of the drums in unwinding the cables will now be described. Meshed with the other head 35 of each drum is a pinion 36 upon a stub-shaft 37, and this shaft also carries a gear 38, which is in mesh with a pinion 39 carried upon a shaft 40. The shaft 40 carries a crank-disk 41, the crank-pin of the disk being indicated by the numeral 42. This pin 42 works in a slot 43, which is formed in an arm 44 adjacent one end thereof, the arm being provided adjacent its other end with a second slot 45, through which projects a pivot pin 46, carried by a supporting arm 47, which is secured at 48 to a suitable bracket or support 49. The inner end of the arm 44 is pivoted as at 50 at the middle of a piston rod 51, carrying a piston at each end, which pistons work in a cylinder 52. It will be understood, from the foregoing description of this portion of the mechanism, that as the cable is being unwound from either drum, the crank disk 41 will be rotated, and the arm 44 will be oscillated upon the pin 46, thereby imparting oscillatory movement to the piston rod 51. It will also be apparent that, in order to adjust the supporting arm 47 upon its securing means 48, so as to adjust the fulcrum 46 near to or away from the pivot 50, the arm 47 has a pointed lower end 53, which arm is moved upon its pivot fastening 48 whereby its lower pointed end swings or moves in the arc of a circle, the support 49 being preferably provided with a scale 54 with the marks of which the said end of the arm registers. The rapid compression of the air in the cylinder 52 will of course retard the speed of rotation of the drums in unwinding the cable, and it will be readily understood that by adjusting the position of the fulcrum 46 in connection with the pivot 50, the stroke of the arm 44 may be varied under different conditions, the location of the pivot 46 at a distance from the pivot 50 providing for a longer stroke of the arm 44, and more resistance being presented to the unwinding of the cable.

In Fig. 4 of the drawings, there is illustrated a means of mounting the mechanism, hereinbefore described, in a satchel or suit case. The mechanism when held in a satchel or suit case is adapted for use in lowering one person at a time from a burning building, and if but a single drum is employed, the automatic re-wind and the clutch mech-

anism associated therewith being omitted, and the crank-handle being secured at one end of the drum shaft and lying beyond one end of the satchel or suit case whereby the
 5 cable may be rewound upon the drum. Aside from the differences mentioned above, this mechanism is identical with that previously described. In order that the retarding mechanism may be rendered inoperative
 10 during the time the cables are being re-wound on their respective drums, a dog and ratchet clutch 35^a is provided for connecting the spools 6 and the respective gears 35 for rotation in unison in one direction and for per-
 15 mitting rotation of the spools in the opposite direction independently of the said gears.

What is claimed is:—

1. In a fire-escape, a shaft, a winding drum upon the shaft, a cable connected with
 20 the drum and adapted to be wound thereon, said drum being loose upon the shaft, a fly-wheel adapted to be clutched with the drum, a winding spool, pawl and ratchet connections between the spool and the fly-wheel,
 25 and a cable wound upon the spool, and a re-wind spring operatively connected with the spool.

2. In a fire-escape, a drum shaft, a drum fastened upon the shaft, a cable connected
 30 with the drum and wound thereon, a fly-wheel upon the shaft adapted to be clutched with the drum, a spool upon the shaft and a pawl and ratchet connection between the spool and the fly-wheel, a cable wound upon
 35 the spool, a lever having connections with the clutch and with the second cable, and means for re-winding the cable upon the spool.

3. In a fire escape, a shaft, drums loose
 40 upon the shaft, clutch members carried at the opposing ends of the drums, an inde-

pendent re-winding mechanism for each drum, cooperating clutch members upon each drum and an element of the respective re-winding mechanism, and means which may
 45 be actuated by the actuation of either re-winding mechanism to separate the clutch members between the drums and cause engagement between the clutch member of one drum and the corresponding member of the
 50 re-winding mechanism.

4. In a fire-escape, a shaft, a winding drum upon the shaft, a cable connected with the drum and adapted to be wound thereon, said drum being loose upon the shaft, a fly-
 55 wheel adapted to be clutched with the drum, a winding spool, pawl and ratchet connection between the spool and fly-wheel, a cable wound upon the spool, and means engaged by the cable and controlled thereby for
 60 clutching the fly-wheel with the drum.

5. In a fire escape, a shaft, a pair of winding drums mounted upon the shaft and adapted to be mutually clutched, a fly-wheel mounted upon the shaft, one outwardly of
 65 each of the drums, a winding spool upon the shaft adjacent each fly-wheel, pawl and ratchet connections between the fly-wheel and the corresponding spool, a cable upon the spool, means acting to normally wind
 70 the cable upon the spool, means engaged by the cable and controlled thereby for clutching either fly-wheel with the corresponding drum, and for clutching and separating the
 75 drums.

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

JOHN H. THORNBURG.

Witnesses:

C. F. PRITCHARD,
 F. PENNINGTON.