J. T. BOUFFORD.

LOWERING DEVICE.

APPLICATION FILED FEB. 25, 1913.

1,071,502.

Patented Aug. 26, 1913.

Fig. 1.

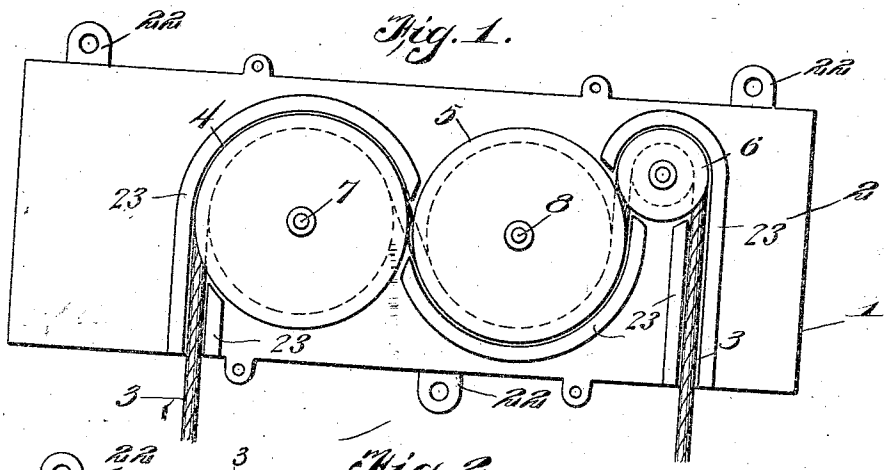


Fig. 2.

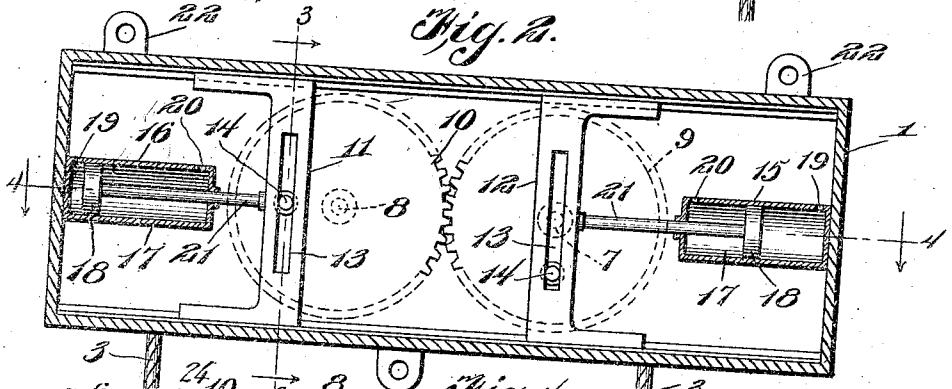


Fig. 4.

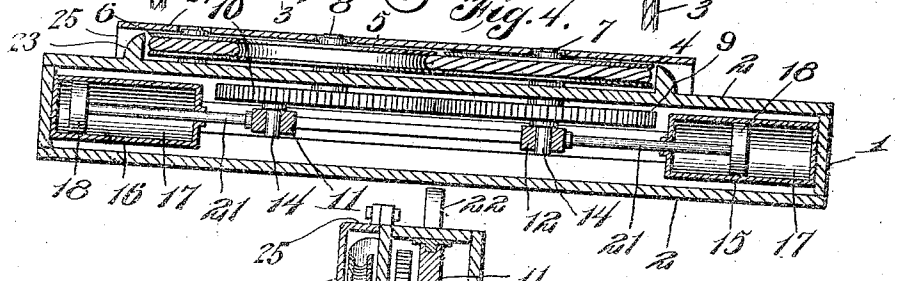
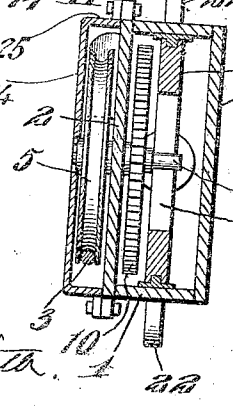


Fig. 3.



WITNESSES

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LOWERING DEVICE.

1,071,502. Specification of Letters Patent. Patented Aug. 26, 1913.

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To all whom it may concern:

Be it known that I, JOSEPH T. BOUFFORD, a subject of the King of Great Britain, residing at Linwood, in the county of Worcester and State of Massachusetts, have invented new and useful Improvements in Lowering Devices, of which the following is a specification.

This invention relates to lowering devices, the device of this invention being especially designed for use as a fire-escape to enable persons to lower themselves from high places to the ground in perfect safety, and at a speed which may be regulated to suit the desire of the manufacturer. The apparatus hereinafter described is also adapted for use in connection with elevators for handling passengers and freight of all kinds, the device being so combined with an elevator that in case the operating supporting cables of the elevator break, said device will be thrown into action and allow the elevator to descend at a limited and safe rate of speed.

With the above and other objects in view, the invention consists in the construction, combination and arrangement of parts, as will be hereinafter more fully described, illustrated in the accompanying drawings, and pointed out in the claims hereunto appended.

In the drawings: Figure 1 is a side elevation of the lowering device of this invention. Fig. 2 is a vertical longitudinal section through the same. Fig. 3 is a vertical cross section on the line 3—3 of Fig. 2. Fig. 4 is a horizontal longitudinal section on the line 4—4 of Fig. 2.

The lowering device contemplated in this invention comprises a frame 1, consisting, in the preferred embodiment of the invention, of a pair of oppositely located housing or casing plates 2 which are spaced at a suitable distance apart, and tied and braced together in any suitable manner, so as to accommodate the gearing and other mechanism, hereinafter particularly described, thereby protecting such mechanism and rendering the device comparatively weather and dirt proof.

3 designates an endless flexible cable, such as a rope, which passes in opposite directions around a pair of actuating pulleys 4 and 5, as shown in Fig. 1, the cable 3 also passing around a guiding sheave 6 which causes the cable to pass for a sufficient distance around the circumference of the adjacently lying actuating pulley 5 to insure the proper frictional engagement of the cable with said pulley. In this way, the endless cable 3 is adapted to drive both of the actuating pulleys 4 and 5.

The actuating pulleys 4 and 5 are mounted fast on parallel shafts 7 and 8 which also have mounted fast thereon a pair of intermeshing spur gear wheels 9 and 10 of the same size and number of teeth, in order that both of the shafts 7 and 8 may be driven at equal speeds in opposite directions. By reason of the construction just referred to, a slight slippage of the cable 3 on either of the pulleys 4 and 5 will make no difference in the operation of the device as a whole, as one pulley is adapted to drive the other under the arrangement described.

Mounted within the frame is a pair of oppositely arranged sliding cross heads 11 and 12, the same being movable lengthwise of the frame, as shown in Fig. 2, and each of said cross heads being provided with a slot 13 extending perpendicularly to the path of movement of the cross heads, the slot 13 receiving a wrist pin 14 projecting from one side of the respective gear wheel 9 or 10 and working back and forth lengthwise of such slot, whereby the rotary motion of each gear wheel 9 and 10 is imparted to the corresponding sliding cross head 12.

Arranged in opposition to each other and at opposite ends of the frame are pneumatic checks 15 and 16, each of which comprises an air cylinder 17 and a piston 18, working therein, the cylinder 17 being provided adjacent to its opposite ends with small perforations 19 and 20, so that in the reciprocatory movement of the piston therein, air will be admitted to and expelled from the cylinder, the size of the perforations 19 and 20 being governed by the load to be imposed upon the cable 3 and the desired rate of speed at which it is proposed to have the load descend on the cable. The pistons 18 of the opposed cylinders are connected by rods 21 to the sliding cross heads 12, as clearly shown in Fig. 2, whereby the movements of the cross heads are resisted by the pneumatic checks just described.

Under the preferred embodiment of this invention, the wrist pins 14 are arranged at a quarter revolution apart, so that a non-synchronous movement will be obtained for the pistons 18, this being important for the

reason that when the wrist pin 14 of one of the wheels 9 and 10 is about midway of the slot 13, in which it travels, there will be comparatively no resistance to the rotation of said wheel. At such a time, the wrist pin 14 of the other wheel is moving in the end portion of the slot of its cross head, where the greatest resistance to the rotation of that wheel will be obtained. This overcomes any irregular and jerking motion to which the load on the cable 3 would be subjected were the pins 14 so located with respect to the wheels 9 and 10 as to arrive at the central portions of the slots 13 simultaneously.

The frame 1 is shown as provided with attaching lugs 22, by means of which it may be secured to or suspended from any suitable fixed support.

What is claimed is:

1. In a lowering device, a frame, an endless cable, pulleys around which said cable passes in opposite directions, and pneumatic checks operatively geared to said pulleys and each embodying an air cylinder and piston, the pistons being geared to the pulleys so as to operate out of synchronism.

2. In a lowering device, a frame, double opposed sliding cross heads mounted to reciprocate in said frame and guided thereby, oppositely arranged pneumatic checks each embodying an air cylinder and a piston working therein, rods connecting said pistons with the cross heads, an endless cable, pulleys around which said cable passes, parallel shafts on which said pulleys are fastened, intermeshing gear wheels also fast on said shafts, and wrist pins on said gear wheels engaging the cross heads.

3. In a lowering device, a frame, double opposed sliding cross heads mounted to reciprocate in said frame and guided thereby, oppositely arranged pneumatic checks each embodying an air cylinder and a piston working therein, rods connecting said pistons with the cross heads, an endless cable, pulleys around which said cable passes, parallel shafts on which said pulleys are fastened, intermeshing gear wheels also fast on said shafts, and wrist pins on said gear wheels engaging the cross heads and arranged approximately at a quarter of a revolution apart.

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

JOSEPH T. BOUFFORD.

Witnesses:
ROSANNA BOUFFORD,
J. EARLE BROWN.