(No Model.) 2 Sheets—Sheet 1.

K. E. KRITCH.

SAFETY ATTACHMENT FOR ELEVATORS.

No. 360,776. Patented Apr. 5, 1887.

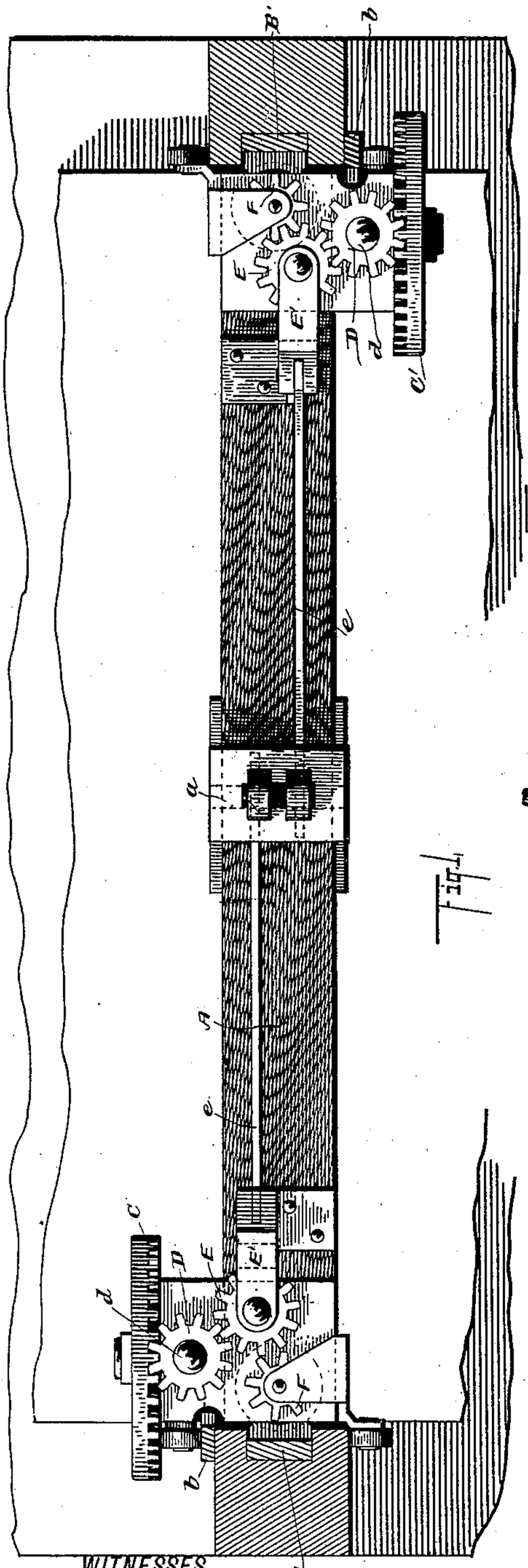

Fig. 1.

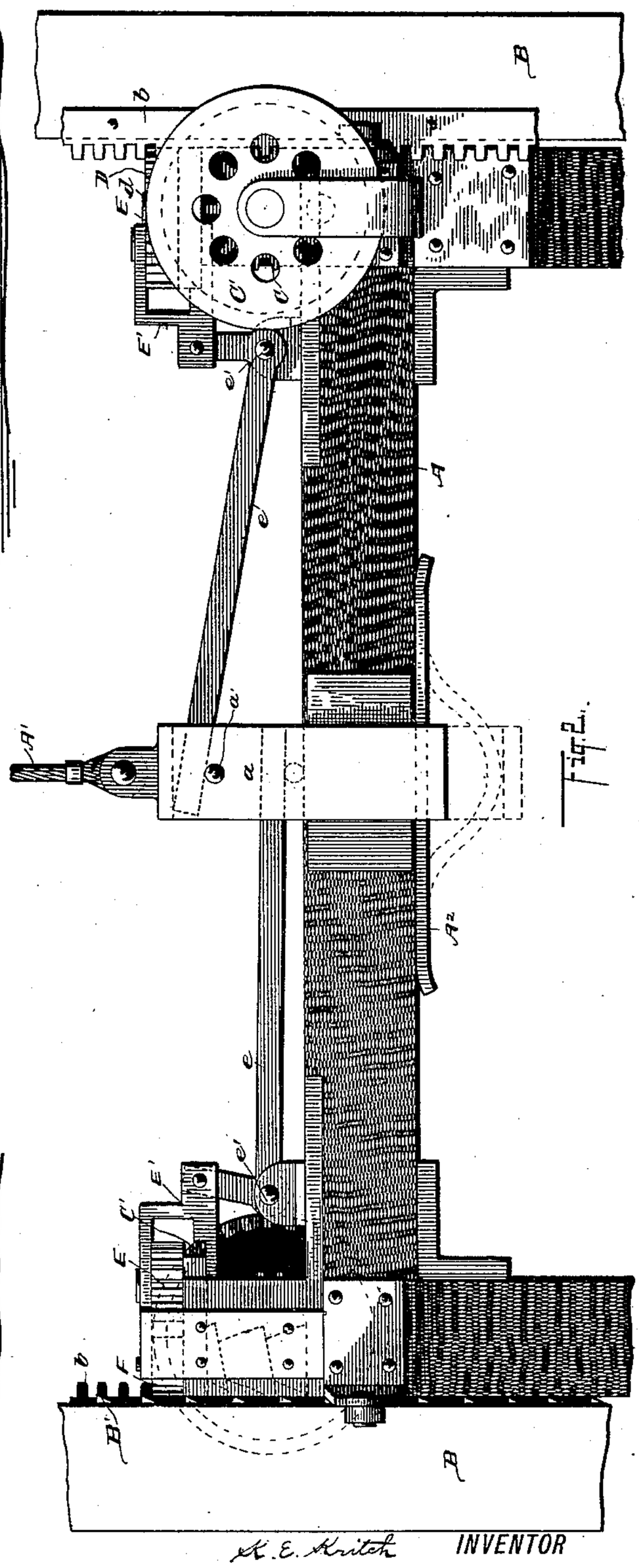

Fig. 2.

WITNESSES
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Attorneys

(No Model.) 2 Sheets—Sheet 2.

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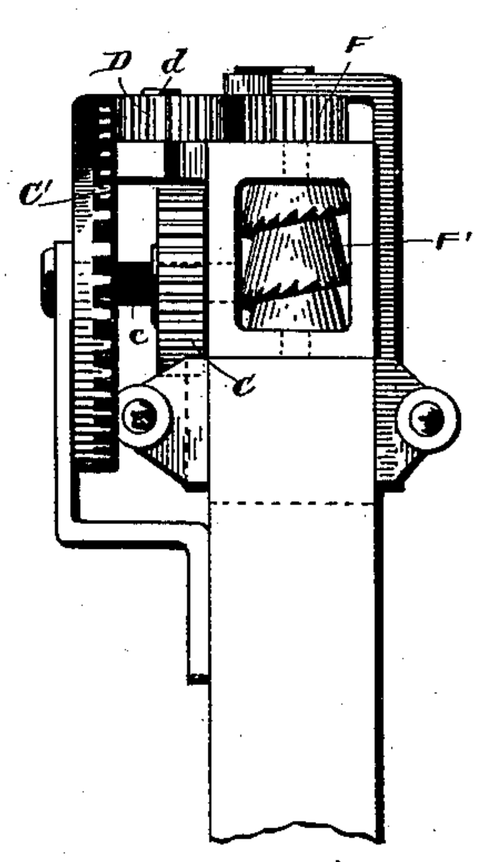

Fig. 3.

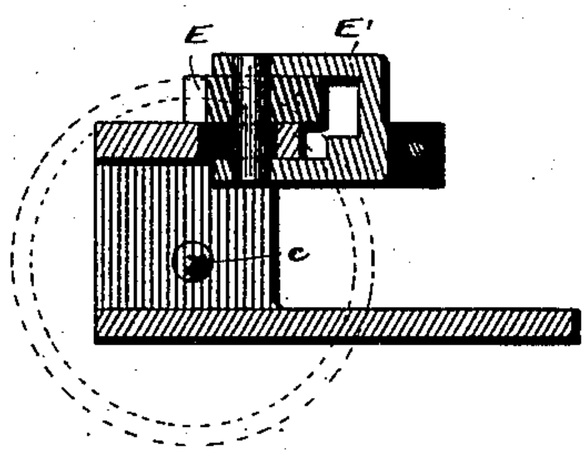

Fig. 4

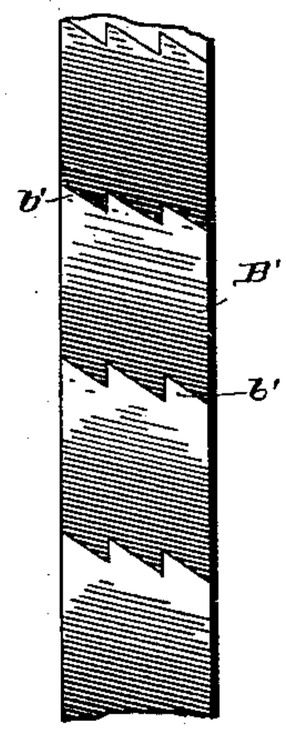

Fig. 6.

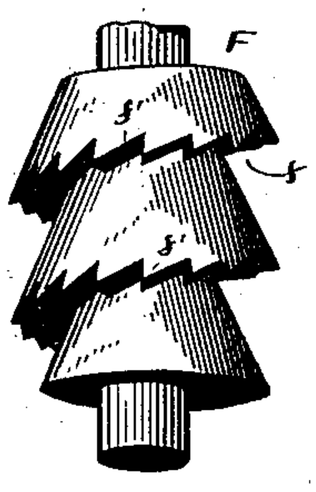

Fig. 5.

WITNESSES

C. S. Amstutz

Chas. A. Wooster

K. E. Kritch INVENTOR

By Leggett & Leggett Attorneys.

UNITED STATES PATENT OFFICE.

KARL E. KRITCH, OF CLEVELAND, OHIO, ASSIGNOR OF ONE-HALF TO THOMAS MAHER, OF SAME PLACE.

SAFETY ATTACHMENT FOR ELEVATORS.

SPECIFICATION forming part of Letters Patent No. 360,776, dated April 5, 1887.

Application filed January 4, 1887. Serial No. 223,368. (No model.)

To all whom it may concern:

Be it known that I, KARL E. KRITCH, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Safety Attachments for Elevators; 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 pertains to make and use the same.

My invention relates to improvements in safety attachments for elevators, such safety attachment consisting, essentially, of a worm and worm-rack, the latter being usually secured along the face of the posts of the elevator-shaft, while the worm is mounted on the elevator. A second rack is secured to each post, to give motion to a train of gears connected with the worm to revolve the latter with the movement of the elevator, the arrangement of gearing being such that the worm, although always in mesh with the teeth of the worm-gear, does not engage the latter when the elevator is in operation, the worm-thread being always kept midway of the teeth of the worm-gear while the elevator is in motion. One of the intermediate gears is mounted on a sliding bearing and held in mesh by the draft of the cable. If the cable breaks, this gear is thrown out of mesh, causing the worm to stop revolving and to engage the teeth of the worm-rack and arrest the descent of the elevator. The engaging surfaces of the worm-thread and the teeth of the worm-rack are serrated, forming teeth that engage each other and prevent the worm from turning when brought in contact with the rack, to the end that, the worm being always in mesh with the worm-rack, the elevator can only fall the limited distance equal to the clearance between the worm-thread and the teeth of the worm-rack, such distance being too slight to cause any damage.

In the accompanying drawings, Figure 1 is a plan view, and Fig. 2 a side elevation, showing elevator mechanism embodying my invention. Fig. 3 is an end elevation. Fig. 4 is a side elevation in section, the sliding box for one of the gear-spindles. Figs. 5 and 6 are enlarged views, respectively a perspective and end elevation, of the worm and a portion of the worm-rack.

The elevator may be of any ordinary construction, and is therefore not shown, except the cross-bar A, to which the cable A′ is attached, and on which the movable parts of my improved device are mounted. The cable attachment consists of a band, *a*, that embraces the cross-piece A, the band having considerable vertical play, so that in case the cable breaks the band can drop a few inches, and a spring, A^2, that is held compressed by the weight of the elevator.

B are the posts of the elevator-shaft, the same being utilized in the usual manner as ways for the elevator to travel on. To the opposing faces of the posts B are secured worm-racks B′, and on the one side of each post is secured a rack, *b*, for engaging a gear, C, the latter being mounted on a stud, *c*, that extends laterally from the cross-piece A, or from a plate or other attachment of the latter.

C′ are crown-wheels that are connected with the respective gears C, so that they move in unison. The two may be cast together; or the crown-wheel may be mounted on the hub of the gear; or they may be attached in any suitable manner. Each crown-wheel engages a pinion, D, that is mounted on the stationary upright spindle *d*. The pinion D engages a pinion, E, the spindle of which is journaled in the sliding block E′. This block has limited movement lengthwise of the cross-bar A, and is held at the one or the other extreme of its throws by a bell-crank lever, *e*, the sliding block being connected with the short upright arm of the lever. The lever is pivoted at *e′*, and the long arm thereof rests on a pin, *a′*, of the band *a*. So long as the cable remains intact the long arms of these levers are held elevated and the blocks E′ are held in position thrust outward toward the adjacent posts B, in which position the pinions E respectively engage the pinions F, the latter being mounted on the spindle of the worm F′. (See right-hand side, Figs. 1 and 2.)

By means of the rack *b*, engaging gear C, and intermediate gearing, the worm F is revolved in the one direction or the other, as the elevator travels up or down.

If the cable breaks, the recoil of the spring A^2 causes the band *a* and the long arm of the levers *e* to descend instantly, disconnecting

the gears E and F. The thread *f* of the worm F′ is set midway of the teeth of the worm-rack B′, and the combination of gearing is such that the worm is given a revolution while the elevator travels a distance equal to the pitch of the worm-thread. For instance, if the pitch of the worm-thread be six inches, the worm is made to revolve once while the elevator travels six inches. The worm-thread therefore always retains its relative position midway of the teeth of the worm-rack; consequently the worm that is always in mesh with the worm-rack never comes in contact with the rack in operating the elevator. Only a slight clearance vertically between the thread and the teeth of the worm-rack is necessary. Now, if the cable breaks and the pinions E and F are separated instantly, as aforesaid, the worm stops revolving, and the thread thereof comes in contact with the teeth of the worm-rack as soon as the elevator descends the slight distance equal the aforesaid clearance, this distance being so small that hardly a jar is felt on the elevator-platform. Owing to the sharp pitch of the worm-thread, the worm would revolve while carrying the weight of the elevator, and consequently would allow the elevator to descend with an accelerated motion, to prevent which the under side of the worm-thread and the top surface of the teeth of the worm-rack are serrated, forming engaging teeth, respectively, *f′* and *b′*. The engagement of these teeth prevents the worm from turning, the result being that the elevator is held stationary.

What I claim is—

1. In a safety attachment for elevators, the combination, with a worm mounted on the elevator, of a stationary worm-rack, the teeth of which are in mesh with the worm, and suitable gearing actuated by rack-bars on the standards or posts for revolving the worm with the movement of the elevator to hold the worm-threads separated from the teeth of the worm-rack, substantially as set forth.

2. The combination, with a worm, worm-rack, and gearing for revolving the worm by the movement of the elevator, substantially as indicated, of an intermediate gear mounted on a sliding bearing, said gear being held in mesh by the draft of the elevator-cable, substantially as set forth.

3. The combination, with worm, worm-gear, and mechanism for operating the same, substantially as indicated, of teeth made on the engaging surfaces, respectively, of the worm-thread and worm-rack, to prevent the worm from turning while engaging the rack, substantially as set forth.

In testimony whereof I sign this specification, in the presence of two witnesses, this 6th day of December, 1886.

KARL E. KRITCH.

Witnesses:
CHAS. H. DORER,
ALBERT E. LYNCH.