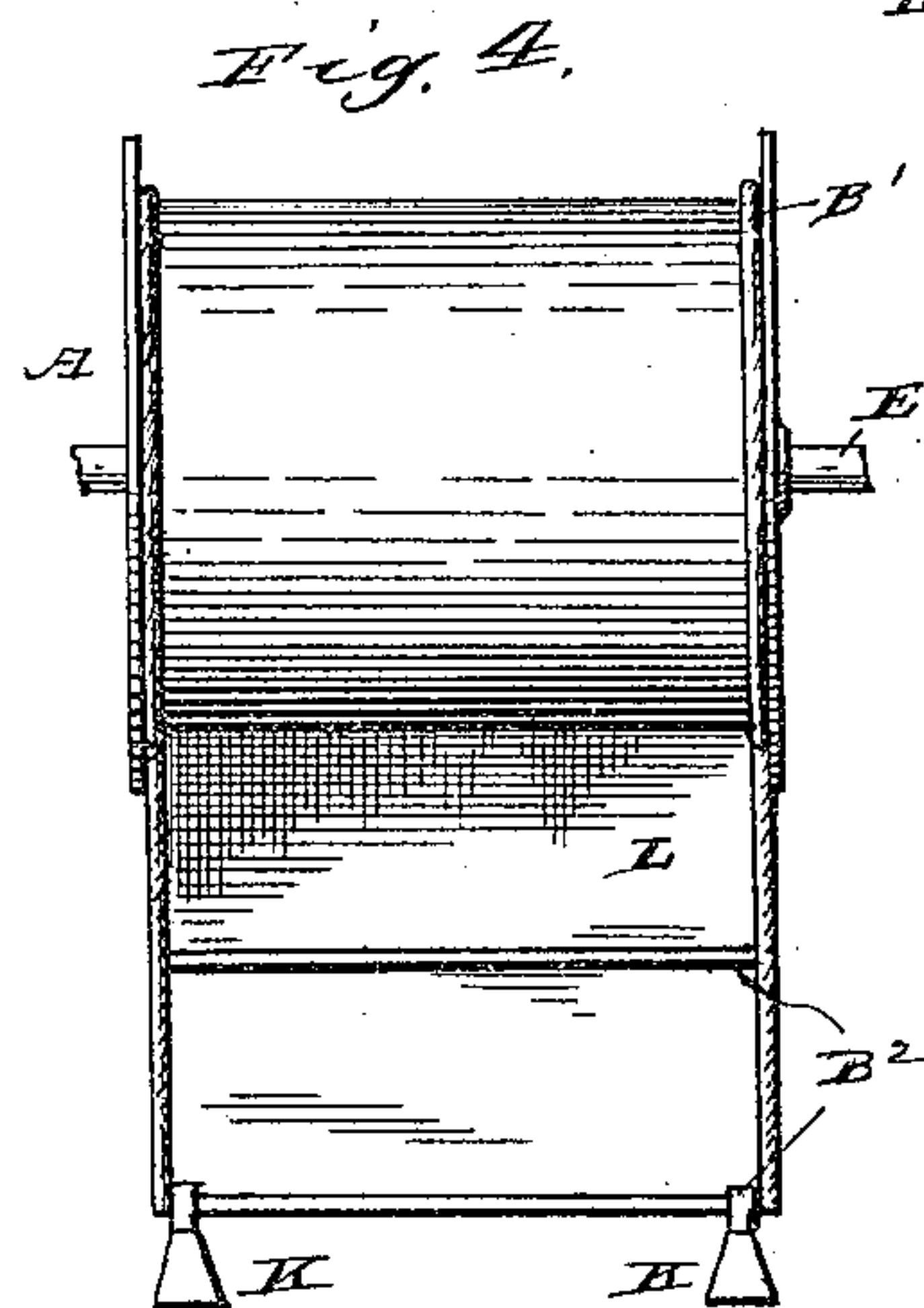
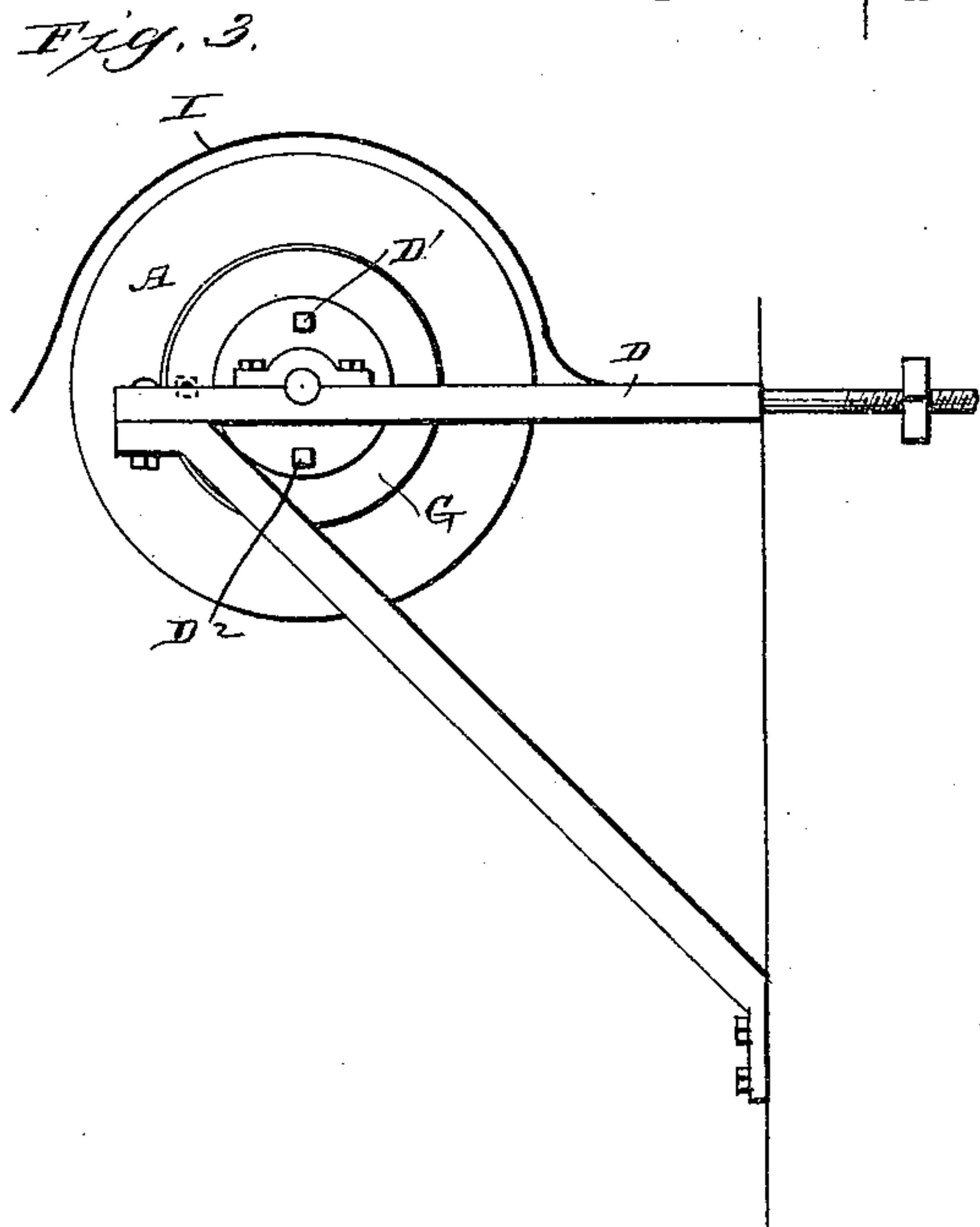
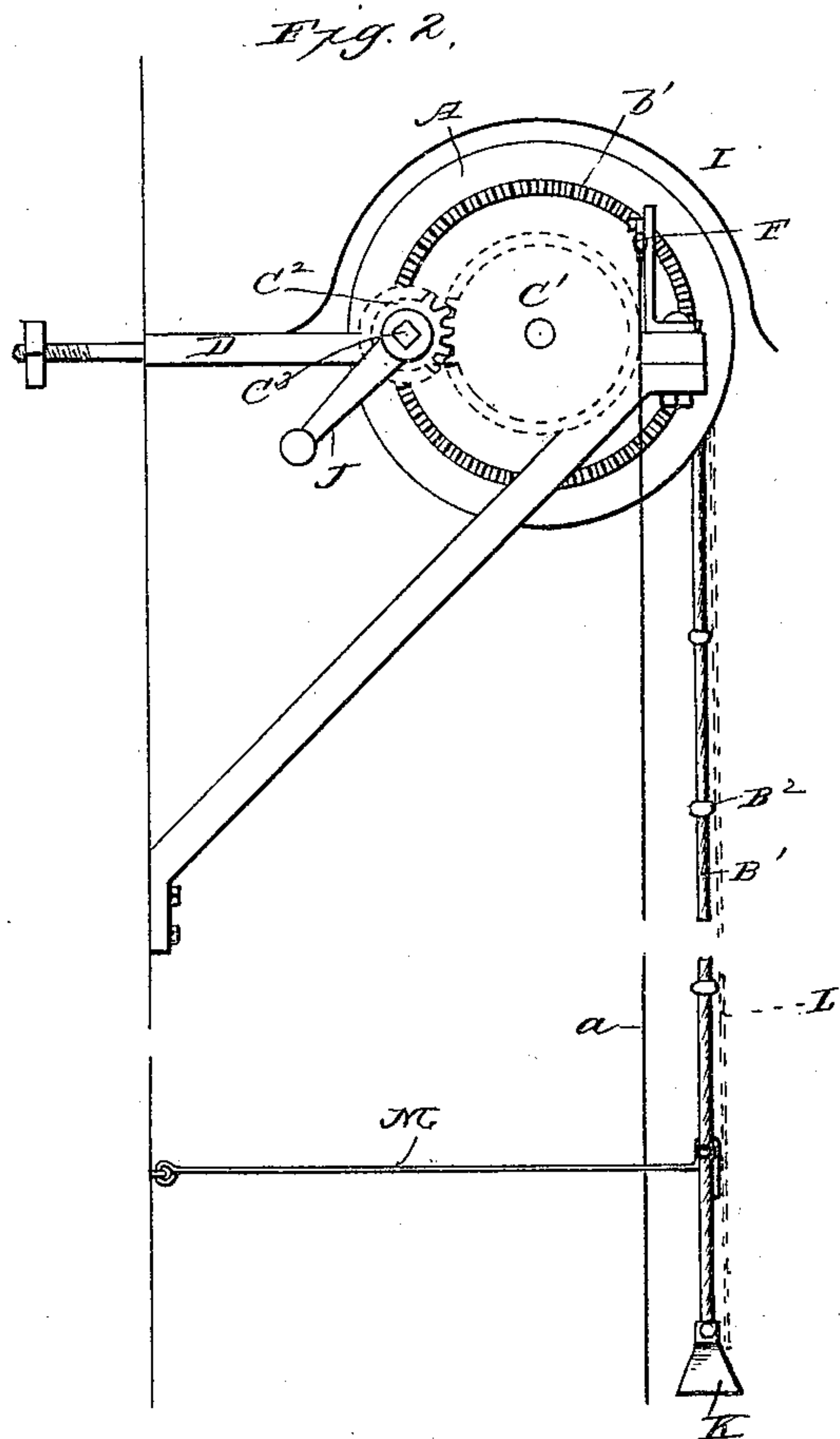
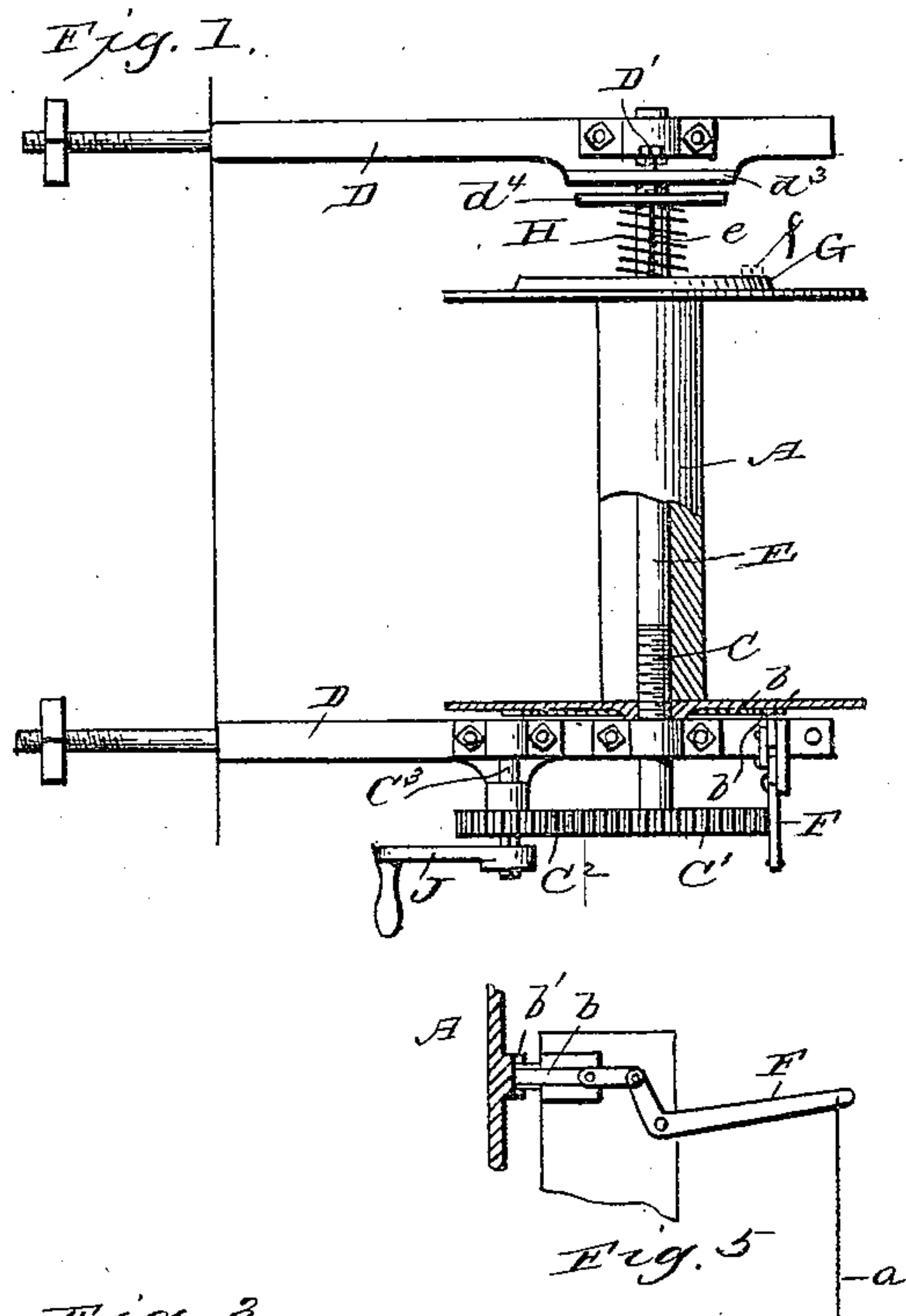


(No Model.)

J. S. BURRIS & M. BIERLINE.
FIRE ESCAPE.

No. 438,224.

Patented Oct. 14, 1890.



Witnesses
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By their Attorneys
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UNITED STATES PATENT OFFICE.

JAMES SALTERS BURRIS AND MICHAEL BIERLINE, OF ST. PAUL,
MINNESOTA.

FIRE-ESCAPE.

SPECIFICATION forming part of Letters Patent No. 438,224, dated October 14, 1890.

Application filed January 14, 1890. Serial No. 336,915. (No model.)

To all whom it may concern:

Be it known that we, JAMES SALTERS BURRIS and MICHAEL BIERLINE, citizens of the United States, residing at St. Paul, in the county of Ramsey and State of Minnesota, have invented certain new and useful Improvements in Automatic Fire-Escapes; and we do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the letters of reference marked thereon.

Our invention has for its object to provide a fire-escape for buildings, which upon being tripped will automatically descend into position for use and afford a convenient and safe avenue of egress from or ingress to the building.

Referring to the accompanying drawings, Figure 1 represents a plan view of our invention partially in section; Figs. 2 and 3, views of opposite ends of the same. Fig. 4 is a rear view showing the application of the hanging covering or curtain to the rear of the ladder. Fig. 5 is a detail view of the drum-locking device.

Similar letters of reference in the several figures indicate the same parts.

The letter A represents a drum or reel, to which is connected and on which is wound a flexible ladder consisting, preferably, of cable-wire ropes B' and rounds of steel B², said rounds being preferably covered with asbestos, rubber, or other non-conducting material that will afford protection against heat, cold, or sleet. The drum A is mounted upon a shaft E, and is connected to said shaft through screw-threads C, formed upon said shaft, engaging with a corresponding female screw-thread in said drum.

Upon one end of the shaft E is secured a gear-wheel C', with which meshes a pinion C², mounted upon a shaft C³, secured to the bracket or frame D, in which the said shaft E has its bearings. A crank or handle J is applied to the pinion-shaft C³, and is made use of in winding up the ladder again after use, as will be further on explained. Mounted also upon the shaft E at the opposite side of

the ladder is a friction-disk G, the same being connected to the shaft by a spline-and-groove connection e, which causes it to rotate when the shaft rotates, but permits it to have an independent movement longitudinally of the shaft. Surrounding the shaft behind the friction-disk G is a spring H, which tends to press forward the disk G, and the tension of which can be regulated by means of set-screws D' D², which work through a stationary bearing d³ and bear against a collar or washer d⁴, interposed between them and the spring H.

F is a pivoted lever connected at its inner end to a pin b, which is adapted to move into and out of engagement with suitable teeth or perforations b' on the outside of one end or head of the drum A, as shown in Fig. 5. The outer end of this lever F has connected to it a small wire hand rope or chain a, which extends down to or nearly to the ground within convenient reach of persons in either story of the building or of the firemen on the ground.

On the lower ends of the ladder are fixed weights K for the purpose of initiating the unwinding of the ladder when released or tripped.

The operation of our invention is as follows: Let it be supposed that the apparatus is located at the upper story of the building and that the ladder is wound upon the drum ready for use. To lower the ladder it is only necessary to pull upon the hand-rope a, whereupon through the operation of the lever F the pin b will be withdrawn from engagement with the drum, and the latter, under the influence of the weights K, will immediately commence to revolve and pay out the ladder. Inasmuch as the resistance offered to the rotation of the shaft E in its bearings is greater than that offered to the rotation of the drum A upon said shaft E, the said drum at first rotates independently of the shaft, but as its velocity increases its screw-connection C with said shaft causes it to move laterally and into contact with the friction-disk G, which thereafter operates to retard its rotation in a degree regulated by the adjustment which has been given the spring H by means of the adjusting-nuts D' D². When the ladder is fully

lowered, it may be steadied by means of hooks M, hinged to the side of the building at intervals and adapted to engage with the rungs of the ladder, as shown in Fig. 2. For the purpose of winding up the ladder again the pin *f* (see Fig. 1) is employed to connect the friction-disk G with the adjoining head or end of the drum, after which the crank J is turned until the ladder is entirely wound up. It will be noted that the shaft should be turned enough to bring the drum back to its normal position before the pin *f* is inserted.

A canvas or asbestos cloth L, Fig. 4, is preferably secured to the ladder on the outside by ropes, straps, or otherwise, so as to be wound up or be unwound with the ladder and perform both the function of a curtain to prevent persons unaccustomed to the use of a ladder from becoming dizzy and falling.

A sheet-iron cover I fits over the frame, as shown in Figs. 2 and 3, and protects both drum and ladder from the weather.

We claim as our invention—

1. The combination, with the shaft E and the drum A, having the screw-connection with the shaft, as described, of the ladder secured to the drum, and the means, substantially as described, for locking and unlocking the drum, whereby upon the release of the drum the same will revolve upon the shaft and move longitudinally thereupon, and a disk secured on the shaft for arresting the longitudinal movement of the drum and locking the drum and shaft together, substantially as described.

2. The combination, with the drum and the ladder connected thereto, of the shaft E, connected to the drum by a screw-connection,

and the friction-disk G, mounted on the shaft so as to turn therewith, substantially as described.

3. The combination, with the drum, of the ladder secured thereto and the shaft connected by the screw-connection to the drum, the friction-disk mounted on the shaft so as to turn therewith, its spring, and the means for adjusting the spring, substantially as described.

4. The combination, with the drum and the ladder connected thereto, of the shaft upon which the drum is mounted, the crank and gears for rotating the shaft, the friction-disk mounted on the shaft, and the pin for connecting the said friction-disk to the drum to wind up the ladder, substantially as described.

5. The combination, with the drum and the ladder, of the independent flexible cloth suspended adjacent to the ladder and winding up and unwinding with the same, substantially as described.

6. The combination, with the drum and the ladder connected thereto, of the shaft upon which the drum is mounted and to which it is connected by the screw-connection, the friction-disk, its spring, and the adjusting-screws, and the pin *b*, lever F, and hand-rope *a*, substantially as described.

In testimony whereof we have hereunto set our hands in presence of two subscribing witnesses.

JAMES SALTERS BURRIS.
MICHAEL BIERLINE.

Witnesses:

LOUIS FEESER, Jr.,
P. W. FARICY.