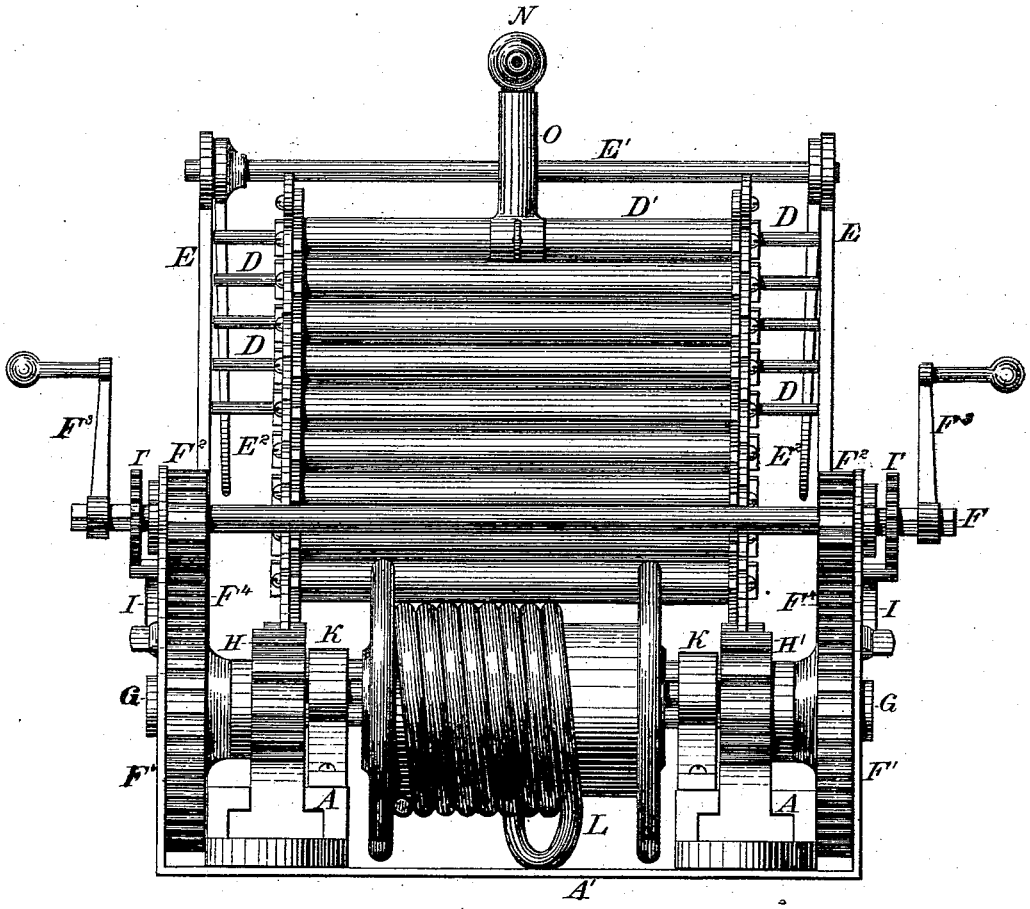
S. KONZ.

Firemen's Extension-Ladder.

No. 167,342. Patented Aug. 31, 1875.

Fig. 1.



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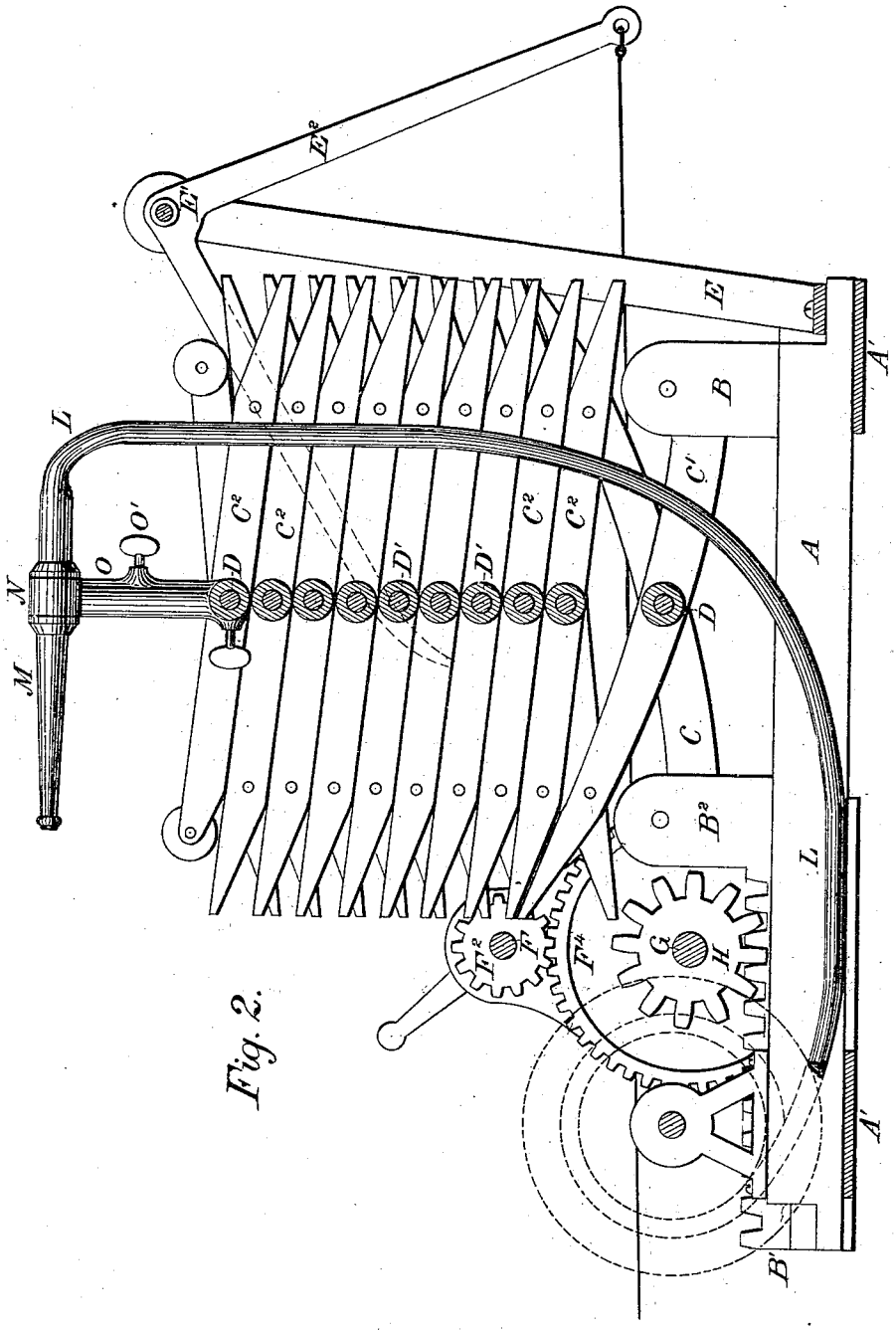

Fig. 2.

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Fig. 4.

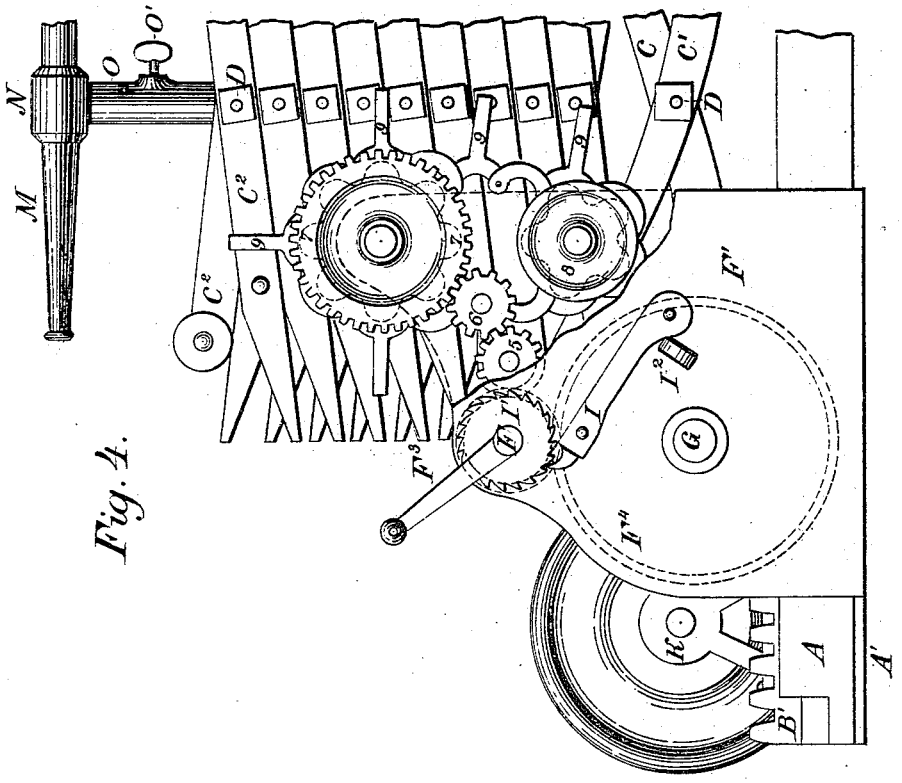
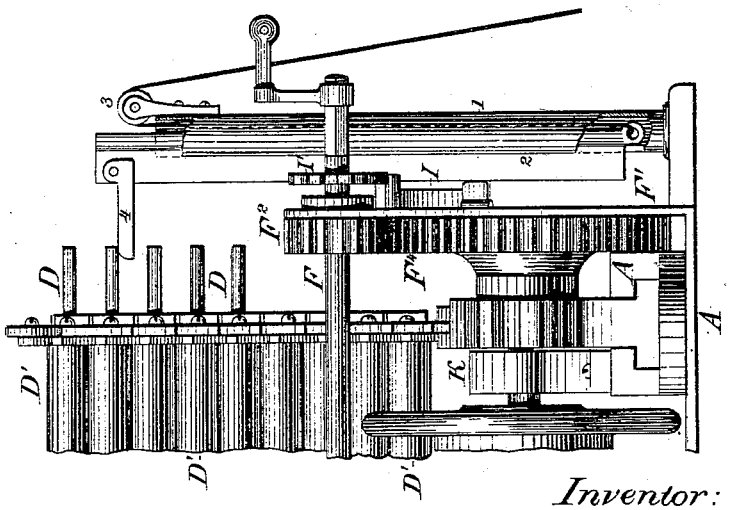


Fig. 3.



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UNITED STATES PATENT OFFICE.

SEBASTIAN KONZ, OF LOUISVILLE, KENTUCKY.

IMPROVEMENT IN FIREMEN'S EXTENSION-LADDERS.

Specification forming part of Letters Patent No. **167,342**, dated August 31, 1875; application filed May 7, 1875.

To all whom it may concern:

Be it known that I, SEBASTIAN KONZ, of Louisville, in the county of Jefferson and State of Kentucky, have invented certain new and useful Improvements in Extension-Ladders; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification—

Figure 1 being an end elevation, showing the ladder in its lowest or folded position, the gearing for elevating the same, the grooved guides in which the geared racks move, the hose-reel, the adjustable socket for attaching the hose to the ladder, and a series of levers for use in starting the ladder from its closed position. Fig. 2 is a side elevation, partly in section, showing the beveled bars which compose the ladder, the elastic tubes which inclose the rungs thereof, the sliding and stationary brackets to which the lower ends of the ladder-bars are attached, a portion of the gearing for moving the same, the hose-reel, the hose in position, the adjustable socket which secures the hose to the ladder, and the lever for aiding in starting the ladder from its closed position. Fig. 3 is a portion of a front elevation, showing some of the parts above enumerated, and in addition thereto a modified form of device for starting the ladder from its closed position; and Fig. 4 is a portion of a side elevation, partly in section, showing a pawl and ratchet for securing the ladder in its elevated position, and another modified form of apparatus for aiding in starting the ladder.

Corresponding letters denote corresponding parts in the several figures.

This invention relates to extension-ladders; and it consists in the construction, combination, and arrangement of the parts of which it is composed, as will be more fully explained hereinafter.

In constructing devices of this character I provide a frame, which may consist of sills and cross-bars, which will adapt it to the reception of wheels for facilitating its transportation. Upon the frame alluded to, but not shown, there are placed two longitudinal grooved bars, A, which are of such length as to adapt them for the reception and support of the other portions of the device, they being held at proper distance apart by bars or rods A′, as shown. In the upper surfaces of these bars grooves are formed, which are wider at their bottoms than at their tops, as shown in Fig. 3. Upon the front end of the bars A projections B are formed or bolted, which are bifurcated to adapt them to the reception of the lower outer end of one of the lower bars of which the ladder is composed. In the groove in the bar A, rearward from the fixed projections B, there is placed a sliding rack, B^1, which has upon its front end a projection, B^2, which is similar in construction to the one, B, just alluded to, and which receives and holds the lower outer end of the other lower bar of the ladder, as shown in Fig. 1. To the bifurcated projections B and B^2 are pivoted the lower outer ends of bars C C^1, which form a portion of a series, C^2 C^2, which constitute the extension portion of the ladder or escape. The series of the extension-bars just alluded to have rods D D extending through their centers and across from one of the series to the other, which are furnished with nuts upon their outer portions for securing them within the bars. Upon the rods D, and between the two series of bars, rubber tubes D′, or tubes of some other elastic material, are placed for the purpose of preventing the operator from slipping when ascending or descending, and also for preventing to some extent the formation of ice thereon. For the purpose of facilitating the first movement of the folded bars C^2, when they are in positions shown in Figs. 2 and 4, the ends of rods D are made to project outward beyond said bars, in order that they may be acted upon by some suitable mechanism for starting them in their upward movement, and thus relieve the strain upon the gearing which elevates them, as the amount of force required to move them at that time is much greater than it is after they have been carried up some distance, owing to the angle at which they are placed with reference to the projections B and B^2.

For operating the sliding racks B^1 B^1 and projections B B^2, there is a shaft, F, mounted

in pedestals F^1 F^1, which carries upon it pinion-gears F^2 F^2 and cranks F^3 F^3, the latter furnishing the means for giving motion to the shaft F and its pinions, and through them to the gear-wheels F^4, which are mounted upon a shaft, G, upon which, and between the wheels F^4, are secured two other wheels, H H′, which mesh into and move the racks B^1 B^1, which operation causes the projections B B^2 to be moved horizontally, thus elevating or depressing the ladder according to the direction in which the gear-wheels are rotated. In ladders of this description it is important that provision should be made for holding them at any desired degree of elevation, and in order that this may be accomplished, there are placed upon each of the pedestals F^1 a dog, I, the outer end of which engages with a ratchet-wheel, I^1, placed upon the shaft F. This dog is so arranged that its own weight will cause its end to come in contact with the ratchet-wheel, when it is liberated from the control of a keeper, I^2, which is secured to the side of the pedestal, and which is so made that when it is desirable to lower the ladder it is turned into such a position as to cause it to throw down the end of the dog, which engages with the wheel and thus allow the ladder to be lowered; but which, when the ladder is to be elevated, is turned in another direction, which causes its eccentric portion to come in contact with the outer end of the dog and thus keep its inner end in contact with the wheel, and so the ladder will be retained at any point desired.

For facilitating the management and the carrying of a hose in connection with a ladder of this description, there is combined therewith a hose-reel and an adjustable socket for holding the discharge-nozzle, the reel being placed in bearings K K, attached to the bars A, or to the frame upon which the device rests. Upon this reel the hose L is wound in such a manner that as the ladder is elevated it will be unwound therefrom. The opposite end of hose L is provided with a discharge-nozzle, M, which is attached to a socket, N, in which it turns freely, said socket having its opposite end fitted to another socket, O, through the inner end of which the upper rod D of the ladder passes, said socket turning freely thereon and being provided with a set-screw, O′, for securing it in any desired position.

It will be seen that owing to the fact that the hose is attached to the upper rung of the ladder and to the reel upon the machine, it is always in place and is always raised with the ladder, its lower end being ready to have attached to it other sections of hose; and, further, that owing to the construction of the adjustable socket, which attaches the hose to the ladder, it is firmly held thereto, and that it may be turned in any direction by the operator, while he is relieved from the necessity of supporting any part of the weight of the hose. In order that the device may be tilted in such a manner as to give the ladder an inclination toward the building, for facilitating the entering thereof through any of its upper windows or doors, rollers are placed in the upper outer ends of the highest of the series of bars C^2, so that if in elevating it, while in its inclined position, the ends should come in contact with the building, it would not be stopped in its movements by catching under window sills or caps.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In combination with the connecting-bolts D D of an extension-ladder, the elastic tubes D′, substantially as and for the purpose set forth.

2. In combination with the rung of an extension-ladder, the adjustable socket N O, the parts being arranged substantially as shown, whereby the discharge-nozzle M is rendered capable of having imparted to it a vertical movement, a movement horizontally through the arc of a circle, and of being placed at any required angle to the rung of the ladder, as and for the purpose set forth.

3. The combination of the reel, the hose, the adjustable socket, and the discharge-nozzle, substantially as and for the purpose set forth.

In testimony that I claim the foregoing as my own invention I affix my signature in presence of two witnesses.

SEBASTIAN KONZ.

Witnesses:

THOMAS W. COLE SCOTT,

W. C. CONDEN.