

No. 692,728.

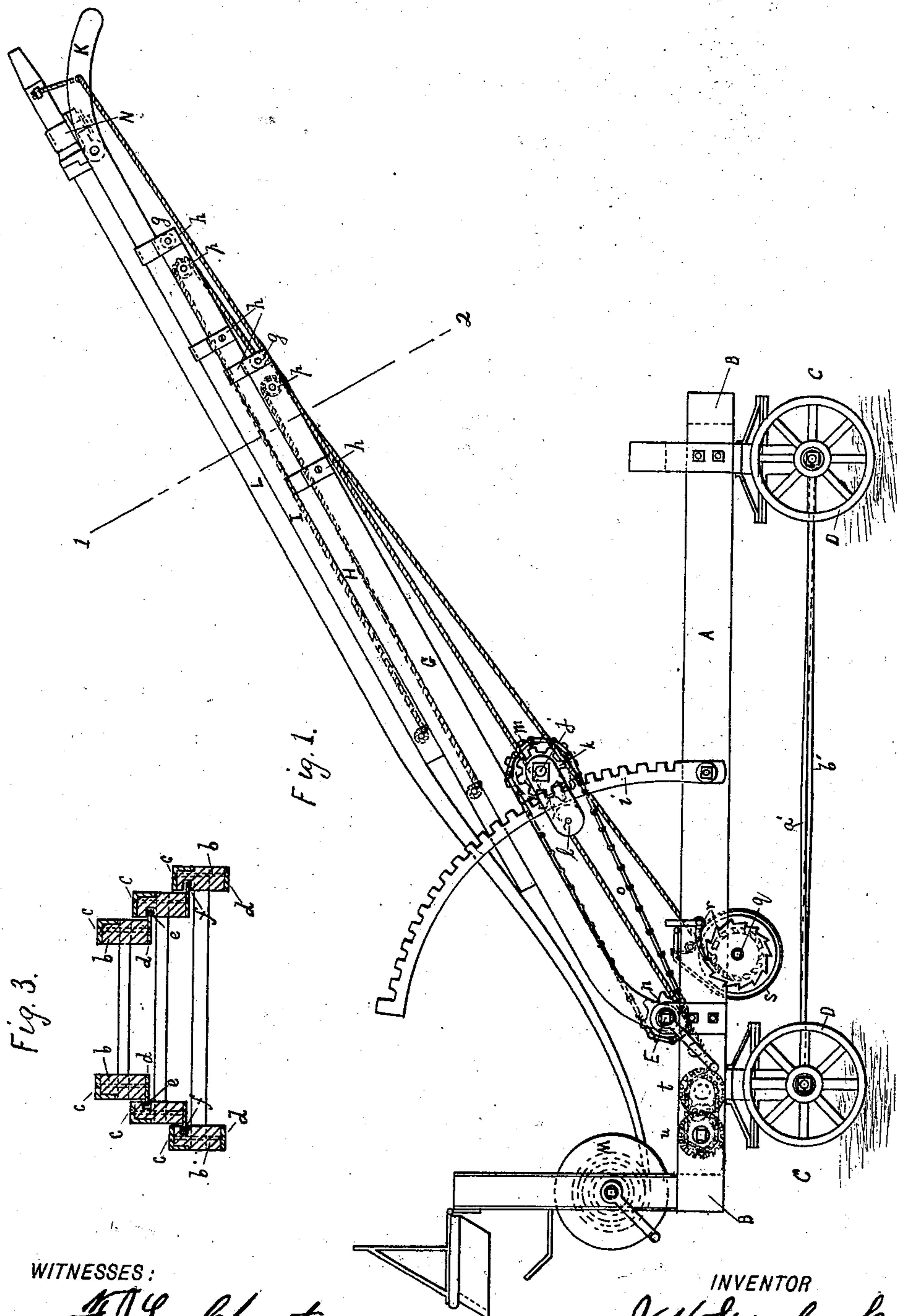
J. H. STAINBROOK.
FIRE LADDER.

(Application filed Aug. 20, 1900.)

Patented Feb. 4, 1902.

(No Model.)

2 Sheets—Sheet 1.



WITNESSES:

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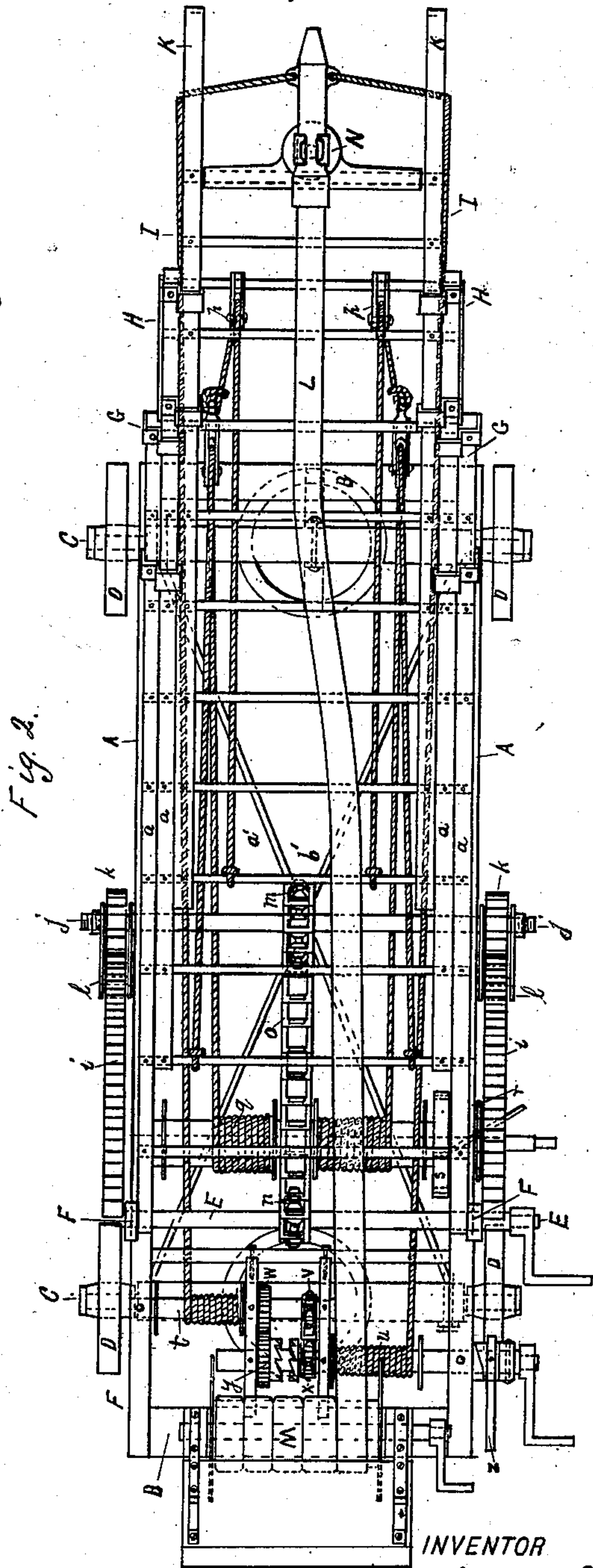
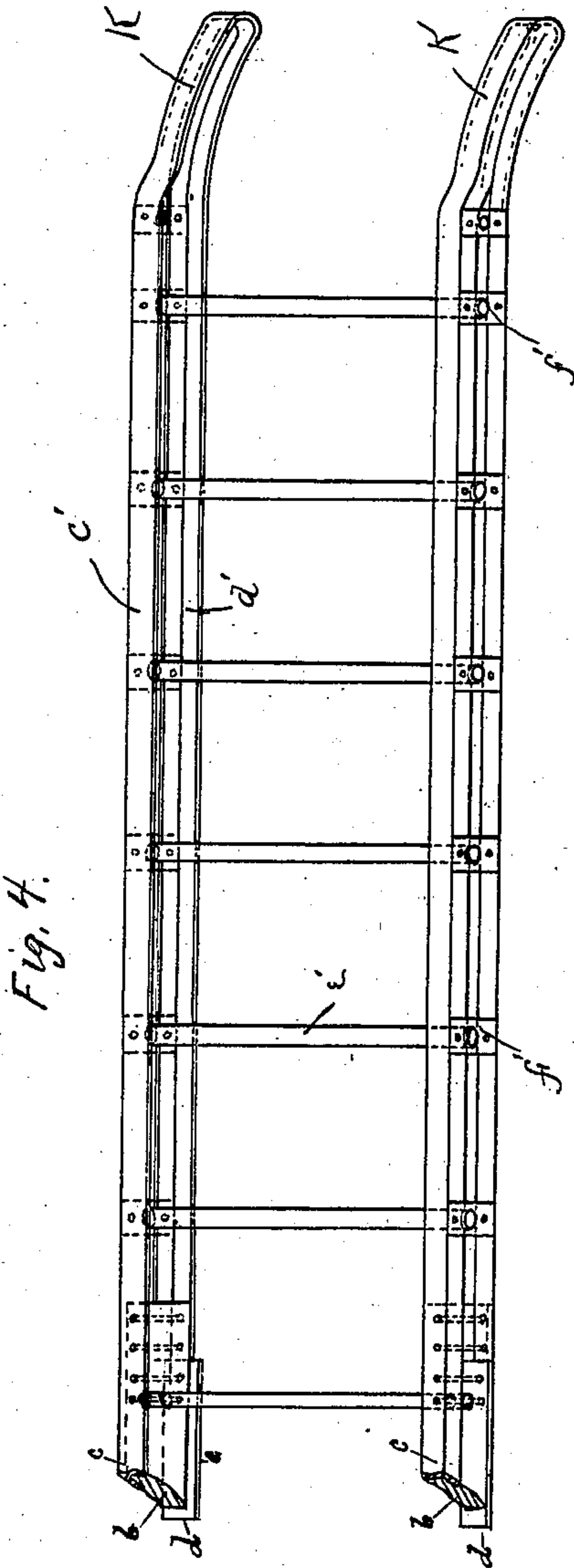
Patented Feb. 4, 1902.

J. H. STAINBROOK.
FIRE LADDER.

(Application filed Aug. 30, 1900.)

No Model.)

2 Sheets—Sheet 2.



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UNITED STATES PATENT OFFICE.

JAMES H. STAINBROOK, OF KANSAS CITY, MISSOURI, ASSIGNOR OF ONE-HALF TO MYRON L. REID, OF KANSAS CITY, MISSOURI.

FIRE-LADDER.

SPECIFICATION forming part of Letters Patent No. 692,728, dated February 4, 1902.

Application filed August 30, 1900. Serial No. 28,547. (No model.)

To all whom it may concern:

Be it known that I, JAMES H. STAINBROOK, a citizen of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented a new and useful Fire-Ladder, of which the following is a specification.

My invention relates to improvements in portable and extensible fire-ladders; and the object of my invention is to provide a ladder having a simple, efficient, and powerful raising device, a strong, durable, and light extension-ladder, a simple and efficient extending device, and having the end or last ladder-section fireproof and fitted with a battering-point.

My invention relates more especially to the following elements: first, a truck-frame for supporting and transporting the ladder and hose; second, an extension-ladder of two or more sections adapted to normally lie in a horizontal position on the truck-frame; third, a mechanism for raising the ladder from its normally horizontal position to or almost to a vertical position; fourth, a mechanism for extending the ladder, being adapted to any number of sections.

I attain the objects enumerated above by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a vertical view of my ladder and tower, showing ladder partly raised from its normal or horizontal position and partly extended. Fig. 2 is a top view of my ladder as in Fig. 1. Fig. 3 is a sectional view of my ladder on line 1 2 of Fig. 1, showing construction of same. Fig. 4 is a view of the upper end of the last section, showing its fireproof construction.

Similar letters refer to similar parts throughout the several views.

The truck-frame.—The side rails A, the ends or cross-bars B, the axles C, and the wheels D form the principal members of the truck-frame. The axles C, both front and rear, are pivotally attached to the framework made up of the side rails A and the cross-bars B. The front end of the truck-frame supports the hose-reel and the foot of the ladder.

The extension-ladder.—The extension-ladder, consisting of a number of ladders sliding within each other, is pivoted to the truck-frame by having the shaft E running loosely

through the side rails of the base-section at its lower end and supported in bearings F, attached to the side rails A. Near the foot of the base-section is a device or mechanism for raising the ladder from its normally-horizontal position to, or nearly to, a vertical position. The ladders slide one within the other from the base-section to the last or top section, and the number of sections is not limited by the principle of construction. The sections are all similar; but the base-section G and the top section I differ from each other and from the intermediate sections in minor respects. The intermediate sections, as represented by section H, have the rails *a* made of a central wood member *b*, bound on its outer face and top edge by the angle-steel *c* and on its bottom edge or face by the flat strap-steel *d*, which projects beyond the outer face, as at *e*. The rounds of the ladder enter the wood section of each rail and are fastened therein by rivets, bolts, or screws passing through the two steel members, the wood section, and the end of the round. Near the rounds and slightly above them in the wood, on the inner face, is cut a longitudinal groove *f*. The base-section G is made like the intermediate sections, except that the strap-steel *d* does not project beyond the outer face. The last or top section below the fireproof part is constructed the same as the intermediate sections, except that it has no groove formed in its inner faces. The ladders are put together one within and above the other successively from the base-section to the top section. The projecting edge *e* of the steel plate *d* slides in the groove *f*. Rollers *g* at the top of all sections except the top section support and make a rolling surface for the rails *a*, while the guide-loops *h* at the top of all sections except the top section partly surround the rails *a* and reinforce the steel plate *d* and the grooves *f* when the ladders are extended by taking part of the strain. The upper or fireproof part of the last section is made by stopping off the wood member *b* and the steel plate *d* and continuing the angle-steel *c* to the end and doubling it back upon itself, forming the lower edge *d'*, similar to the top edge *c'*, and continuing it back to the end of the wood member *b*. The end of the section is bent downwardly and is curved, projecting beyond the end of the hose-nozzle, forming the battering-point

K for breaking in doors and windows and for making openings in walls to admit the water from the hose-nozzle. The rounds e' of the fireproof portion are of steel and are rigidly fastened into the straps f' , which connect the angles forming the upper and lower edges d' and c' of the rails.

The raising mechanism.—At a point between the front and rear axle on each side one end of a rack-gear i is pivoted to the side rail A. The base-section supports a shaft j , bearing pinions k and carrying movable guide-rollers l , held between cheek-plates pivoted on the shaft j , so as to swing freely upon it, the pinions working in the racks i , the guide-rollers l working opposite the pinions and against the racks or segments i and holding them in mesh with the pinions k . The shaft j carries a sprocket-wheel m , rigidly fastened to it in the middle. The shaft E, pivoting the foot of the ladder, supports a sprocket-wheel n at its middle and in line with the sprocket-wheel m , and the two sprocket-wheels are connected by a sprocket-chain o , so that when the shaft E is turned the motion is communicated through these elements to the pinions k , and the latter will move up or down the rack i , carrying the ladder with them, thus raising it from its horizontal position on the truck-frame

The extending device.—Each ladder-section, except the last or top section, carries near its top end a sheave-pulley p , having a rope paying over it, one end fastened to the top of the ladder preceding and the other end being attached to the bottom of the ladder-section following. The base-section G has one end of the rope passing over its pulley fastened to a windlass q at its base. The windlass q has a ratchet and automatic detent r for catching and supporting the ladders as they are extended, and a friction band brake S for regulating the descent of the ladders, and a crank for operating the windlass. When the crank is turned, the rope winds upon the drum of the windlass q . The end of the rope attached to the bottom end of the second section is drawn toward the pulley p at the top of the base-section, and thereby moves the second section upward along the base-section. The rope of the third section being fastened at one end to the top of the first section and at the other end to the base of the third section and passing over a pulley at the top of the second section as the latter is raised by the first rope and the top advances, the third section will be extended. The additional sections are connected like the third and will advance in like manner as the windlass is turned and the first rope is wound up.

Owing to a division of this application being required, the mechanism for operating the hose-nozzle from the foot of the ladder shown in the drawings is withheld to form the subject-matter of a future application, as is also the universal joint for supporting the hose-nozzle in place at the top of the ladder,

permitting the hose-pointing mechanism to direct or point the nozzle at the will of the operator.

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

1. In a fire extension-ladder the side rails A, the bearings F, fastened to the said side rails, the shaft E, resting in the said bearings F, the sprocket-wheel n , fixed on the said shaft E, means for rotating the shaft E, the toothed segments i , pivoted at one end to the side rails A, in combination with the ladder G, pivoted on the said shaft E, the shaft j , mounted on the ladder G, having the sprocket-wheel m , fixed upon it, the spur-gears k , mounted upon the ends of said shaft j and meshing with the toothed segments i , the movable guide-rollers l , and the sprocket-chain o , connecting the said sprocket-wheels m , n .

2. In a fire extension-ladder, the rails A, the bearings F, fastened to the said rails A, the shaft E, the sprocket-wheel n , mounted on the shaft E, means for rotating the said shaft E, the toothed segments i , pivoted at one end to the rails A, the windlass q , mounted on the rails A, between the bearings F, and the segments i , bearing on its shaft outside the rail A, a ratchet and detent r , and on the inside of said rails A, a friction band-brake S, in combination with the ladder G, pivoted on the said shaft E, the shaft j , mounted on the ladder G, the sprocket-wheel m , on said shaft j , the spur-gears k , mounted on the ends of the said shaft j and meshing with the toothed segments i , the movable rollers l , the sprocket-chain o , connecting the said sprocket-wheels m , n , the ladder H, telescoping the ladder G, ropes from the windlass q , passing over pulleys at the top of the ladder G to the base of the ladder H, the ladder I, telescoping the ladder H, ropes attached to the top of the ladder G passing over a pulley at the top of the ladder H and attached to the base of the ladder I.

3. In a fire extension-ladder, the windlass q , the ratchet and detent r , the friction band-brake S, in combination with the ladder G, the ladder H, telescoping the ladder G, ropes from the windlass q , passing over pulleys at the top of the ladder G to the base of the ladder H, the ladder I, telescoping the ladder H, ropes attached to the top of the ladder G, passing over a pulley at the top of the ladder H, and attached to the base of the ladder I, the lower part of the said ladder I, having the rails a , made of the wood member b , the angle-steel c , and the strap-steel d , the upper part of the ladder I, formed by continuing the angle-steel c , forming the upper edge c' , the battering-point K, and the lower edge d' , the plates f' , connecting the upper edge c' with the lower edge d' , and the steel rounds e' .

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Witnesses:

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