

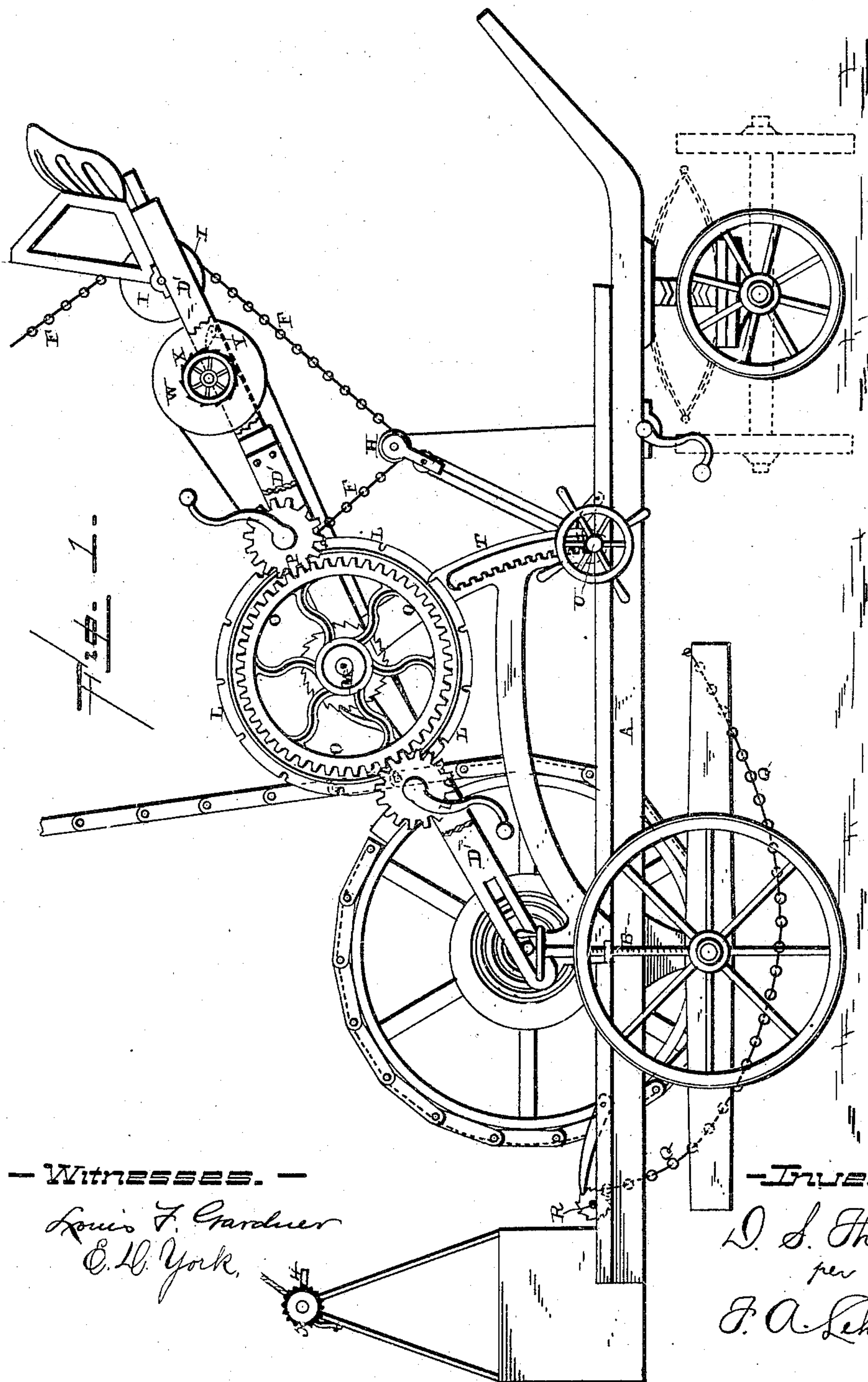
(No Model.)

3 Sheets—Sheet 1.

D. S. THOMAS.
FIRE ESCAPE.

No. 314,628.

Patented Mar. 31, 1885.



— Witnesses. —

Louis F. Gardner
E. H. York,

— Inventor. —

D. S. Thomas,
per
F. A. Lehmann,
Atty

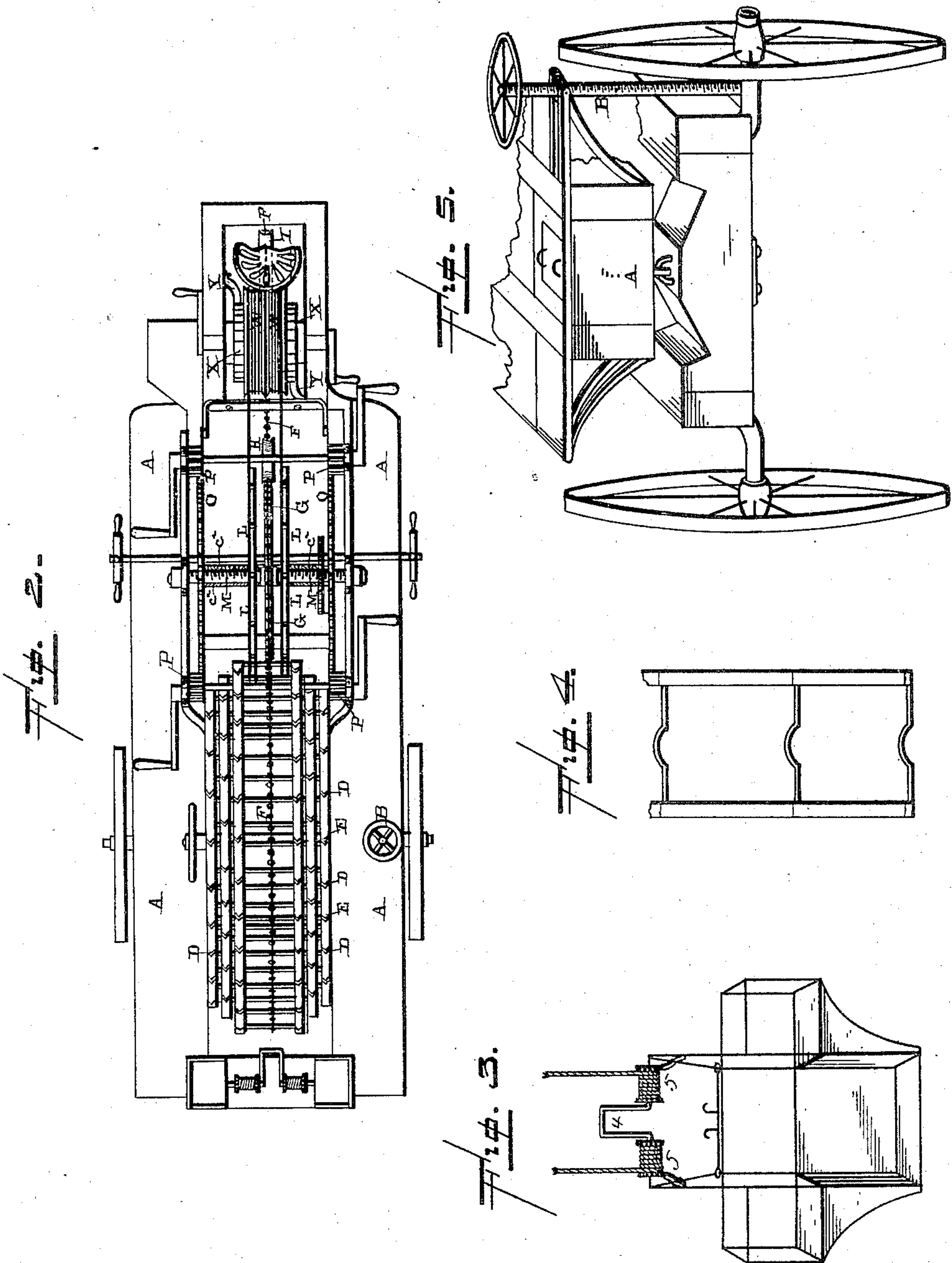
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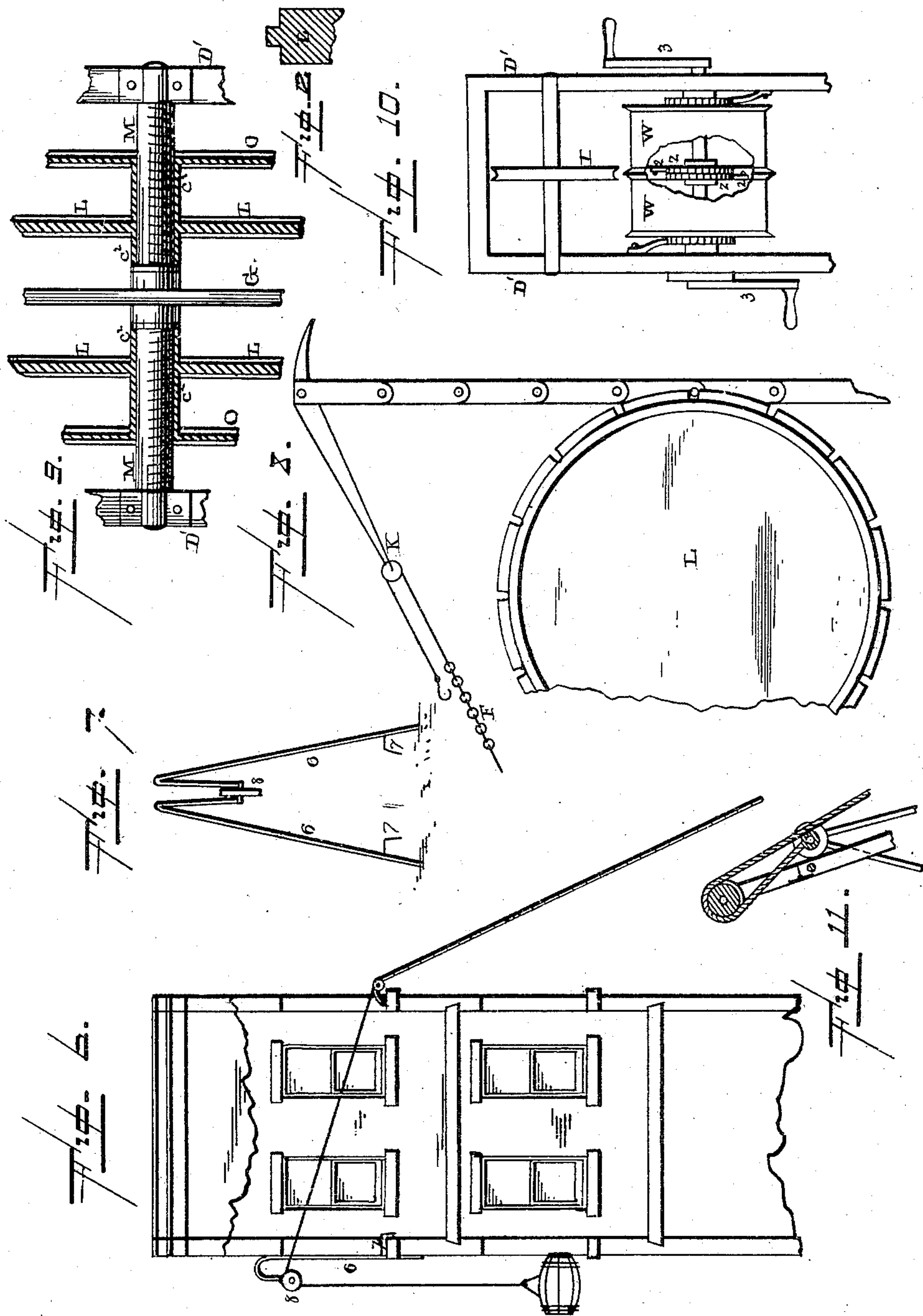
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UNITED STATES PATENT OFFICE.

DAVID SHELDON THOMAS, OF NORTH PLATTE, NEBRASKA.

FIRE-ESCAPE.

SPECIFICATION forming part of Letters Patent No. 314,628, dated March 31, 1885.

Application filed February 3, 1883. Renewed March 3, 1885. (No model.)

To all whom it may concern:

Be it known that I, DAVID S. THOMAS, of North Platte, in the county of Lincoln and State of Nebraska, have invented certain new and useful Improvements in Fire-Escapes; 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 it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to an improvement in fire-escapes, and is intended especially as an improvement upon the patent granted to me July 5, 1881, No. 243,994; and it consists, first, in the combination of the reel, the ladder, which is made tapering in width, the elevating-wheels, which catch over the rounds of the ladder, the toothed wheels and sleeves for connecting them with the elevator-wheels, the shaft provided with right and left threads, and the operating-pinions; second, the combination of the reel, the ladder, the chain which supports the ladder, two wheels provided with pawls and ratchets, and the ropes which extend therefrom, as will be more fully described hereinafter.

Figure 1 is a side elevation of my invention complete. Fig. 2 is a plan view of the same. Figs. 3, 4, 5, 6, 7, 8, 9, 10, 11, 12 are detail views of the same.

A represents the frame or carriage, which is supported upon two trucks, which are made independent of each other, so that the front one can be turned at right angles at any time, for the purpose of bracing the machine in position. In order to lift the frame in case the machine should be standing upon uneven ground, the frame is pivoted or otherwise loosely attached upon the axles, and the screw rod or shaft B is then passed down through a rolling nut on one side of the frame and swiveled at its lower end to a suitable collar or other device which is secured to the rear axle. By turning this screw-shaft the frame will be raised or lowered upon this side, at the will of the operator, until a perfectly level position is obtained. For the purpose of allowing this frame to thus rock upon the axles the tops of the axles are recessed, as shown. This screw-rod holds the frame rigidly in any position in

which it may be adjusted, and thus prevents any tilting or turning of the frame upon its pivots. The reel around which the ladder is wrapped has the spirals formed upon its ends, and is operated in the same manner as shown and described in my former patent. The ladder is also made in sections and made to wrap around the reel, and instead of having the ladder the same width from one end to the other it is made wider at its lower end and to taper regularly toward its upper one. In order to prevent the ladder from being wrapped upon the reel in such a manner as to form a great thickness and thus take up unnecessary room, the end of the ladder that is secured to the reel is let in the thickness of one of the sections, and then as the ladder is wound upon the reel the sections wrap one within the other, as shown in Fig. 2, and do not occupy as much room as they would do if the ladder were made of the same width all the way along. Each section of the ladder has a V-shaped notch, D, formed in one end, and a corresponding projection, E, formed upon its other end, and when these ends come together as the ladder is raised into position the projections fit into the V-shaped notch, and thus act as braces to strengthen and bind the different parts of the ladder securely together.

Wrapped around the reel with the ladder, as described in my former patent, is the chain F, which supports the ladder in position as it is raised upward. This chain F passes up over the top of the grooved last pulley, G, down under the pulley H, which is used to take up all slack in the chain, and then forward under the guiding-pulley I upon the front end of the pivoted support, extends upward and has connected to its other end the connecting cords, wires, or chains K, by means of which the upper end of the chain can be readily connected to and disconnected from the ladder, so as to let out the chain so that it can all be let down or all wound up.

The ladder is raised into position by means of two toothed flanged disks, L, which catch over the rounds of the ladder and raise it upward when the disks are made to revolve. These disks form a part of or are secured in any suitable manner to suitable sleeves, c^2 , which fit upon the right and left screw-threads

of the rod M, which is secured rigidly at its ends to the support D'. To the outer ends of the collars or sleeves c^2 , which are placed upon this screw-rod, are the gear-wheels O, which mesh with the wide pinions P. These pinions are placed upon shafts, which are journaled in the support, and which are provided with cranks upon each of their ends. When these two shafts, or either one, are made to revolve, motion is communicated to both the gear and toothed wheels, and the sleeves then move in or out upon the screw-rod, according to the direction in which the pinions are turned. As one of the threads upon the rod runs to the right and the other to the left, one gear and one toothed wheel move in one direction, while the other gear and other toothed wheel move in the opposite one. This reverse movement is given to these parts for the purpose of making the toothed wheels accommodate themselves to the various widths of the sections which form the ladder. The upper end of the ladder being quite narrow, the toothed wheels, when the ladder is wound upon its reel, will be quite close together; but as the ladder is forced upward the toothed wheels are gradually carried outward, so as to correspond to the increasing width of the ladder. As the gear-wheels move with the toothed wheels, the pinions are made of a width corresponding to the amount of movement which is given to the gear-wheels. These gear-wheels will be placed either inside or outside of the support, as may be preferred, as I do not limit myself to the precise location here shown. The toothed wheels will have the teeth in them so formed as to catch over the rounds of the ladder, and when the wheels are turned in one direction will lift the sections of the ladder upward, and when turned in the opposite direction will force the ladder downward, so that it will be wrapped upon its reel.

In order to prevent the ladder from becoming loose upon its reel, suitable cords, wires, or chains, Q, are fastened to the front end of the truck, and then extend backward underneath the reel, and are fastened at their rear ends to a shaft, R, that is placed upon the frame. This shaft is provided with a pawl and ratchet, so as to hold the cords or chains at any tension at which they may be turned. As these cords, wires, or chains bear against the under side of the ladder when tightened by the shaft, it will be readily seen that the ladder is clamped tightly against the reel, so that it cannot work loose nor rattle, so as to make an unpleasant noise.

The support D', which is pivoted to the frame at its rear end, and which forms the bearing for the pulleys and other parts of the machine, has toothed slots made down through its legs T, and meshing with the teeth of these slots are pinions, which are placed upon a shaft, U, which extends across the frame. This shaft is provided with a pawl and ratchet, and is thus held at any point to which it may be adjusted. By turning this shaft the support

is raised or lowered, so as to adjust the inclination of the ladder according as the house is a tall or a low one, or the purpose for which the ladder is being used.

Upon the front end of the support, just in the rear of the guiding-pulley, and under which the chain passes, are two spools or drums, W, journaled upon the same shaft. These spools are both placed loosely upon the shaft, and each has a separate and independent rope wrapped around it. Each spool has a ratchet, X, formed on its outer end, the teeth of which run in opposite directions, and with each of which a pawl, Y, engages. These pawls are secured to the frame, and serve to prevent one spool from turning back when the other spool is being operated.

Secured to the center of the shaft on which the two spools are placed are two ratchets, Z, the teeth of which are turned in opposite directions, and with which engage the two pawls 2, which have their outer ends formed into levers which extend outward, so that they can be operated by hand. When one or both cranks 3 are turned in one direction, one of the spools is turned, and when the motion of the shaft is reversed the other spool is turned. When it is desired that either one of the spools shall not operate, its pawl is thrown out of gear.

One of the spools has a rope or chain wrapped around it for the purpose of raising the elevator, and the other one has a similar rope or chain wrapped around it to be used for lowering objects from the building, and these two ropes or chains may move in opposite directions. While one is being wound upon its spool the other is being unwound. These ropes pass backward to the base of the ladder under suitable pulleys, and thence up to the top of the ladder over pulleys on the top round. The one that operates the elevator passes down and is fastened to the slide that moves upon the front of the ladder, as shown and described in my former patent. To this slide is suspended the elevator by means of suitable ropes, and in order to enable the elevator to be raised and lowered by a person or persons in it, the elevator is provided with a crank-shaft, 4, which is provided with one or more spools, 5. By operating this crank-shaft 4, which should be provided with suitable ratchets, the elevator can be raised and lowered along the front of the building at will.

The rope which passes around the other spool is intended to be used for lowering objects from a burning building, in connection with a derrick, 6, which is to be placed in a window on the opposite side of the house or on the same side. This derrick 6 is provided with suitable hooks, 7, to catch over the window-sill, and with a pulley, 8, at its top, over which the rope passes. This derrick having been placed in position in a window, articles of all kinds can be lowered to the ground by operating the spool W as long as it is safe to do so, and then the operator can descend upon either the ladder in the elevator, or by the rope which

passes over the derrick. Should the heat become too great to work the fire-escape with the ladder up to the wall, the ladder can be raised into a vertical position and the rope
5 operate just as well with the upper end of the ladder at a distance from the wall.

If so desired, the rope connected to the elevator may be disconnected therefrom and used to lower articles down the front of the building, and then the two ropes may be made to
10 operate in connection, one upon the front and the other upon the rear of the building, the two ropes always moving in opposite directions, so as to have them operate one at a
15 time, and thus never have such heavy loads that the persons turning the cranks on the spool-shaft cannot manage them.

It will be seen that when the support is raised up so that the ladder is resting against the
20 building the cranks on the spool-shaft will be so high they cannot be reached from the foot-board, so there will be a foot-board on each side secured directly to the support, on which the operator can stand, and these boards of
25 course rise and fall with the support.

By forming flanges on both sides of the two elevating-wheels the flanges bear against the sections of the ladders, and thus brace and
30 strengthen them while being raised into position.

Having thus described my invention, I claim—

1. In a fire-escape, the combination of the reel upon which the ladder is wound, the jointed tapering ladder, toothed elevating-
35 wheels L, which catch over the rounds of the ladder, the pinions P, spur-wheels O, and the screw-shaft upon which the wheels O L are placed, and the connecting-sleeves, substantially as shown. 40

2. In a fire-escape, the combination of the reel upon which the ladder is wound, the jointed tapering ladder, the spur-wheels O and operating-pinions P, the elevating-wheels
45 L, which catch over the rounds of the ladder, the screw-shaft provided with right and left threads, and the sleeves c^2 , substantially as shown.

3. In a fire-escape, the combination of the reel, the ladder, and the chain F, with the two
50 reels W W, and their ratchets and pawls, and the ropes which extend therefrom, substantially as specified.

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

DAVID SHELDON THOMAS.

Witnesses:

E. M. DAY,

H. H. BLAKESLY.