

No. 672,998.

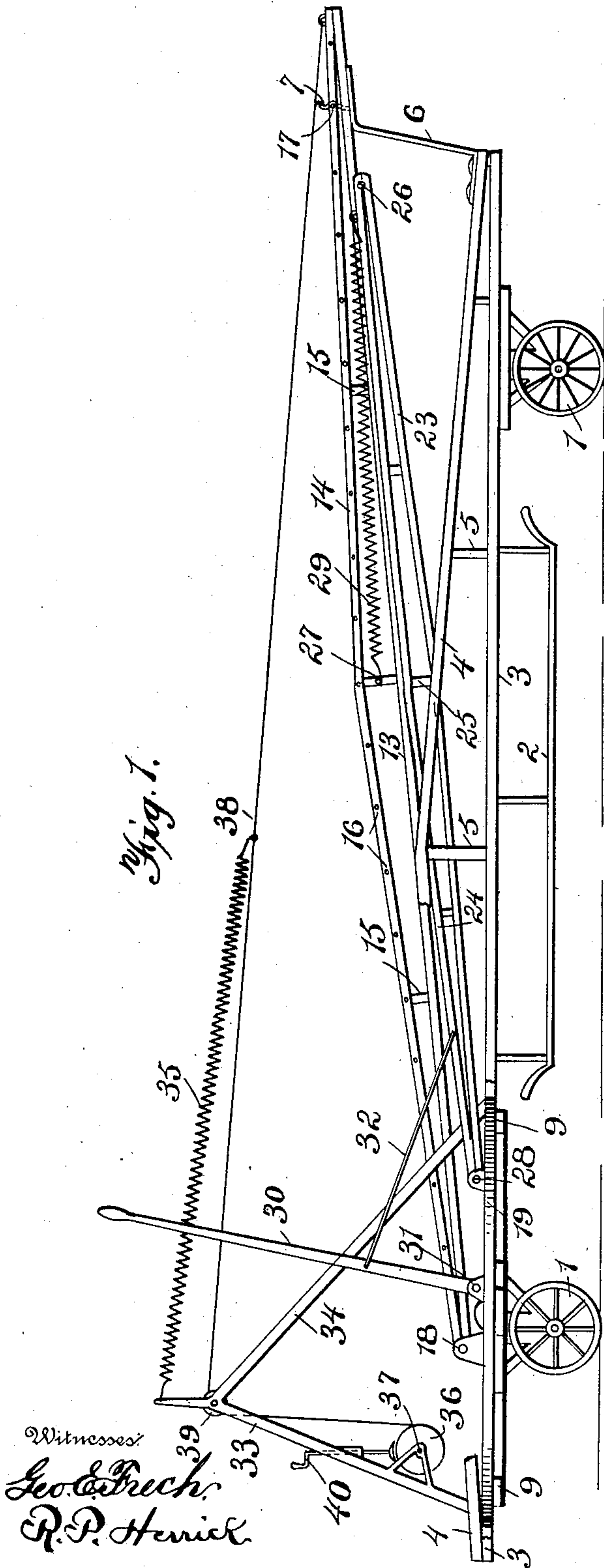
Patented Apr. 30, 1901.

B. B. BRIGGS.
FIRE ESCAPE.

(Application filed Mar. 27, 1900.)

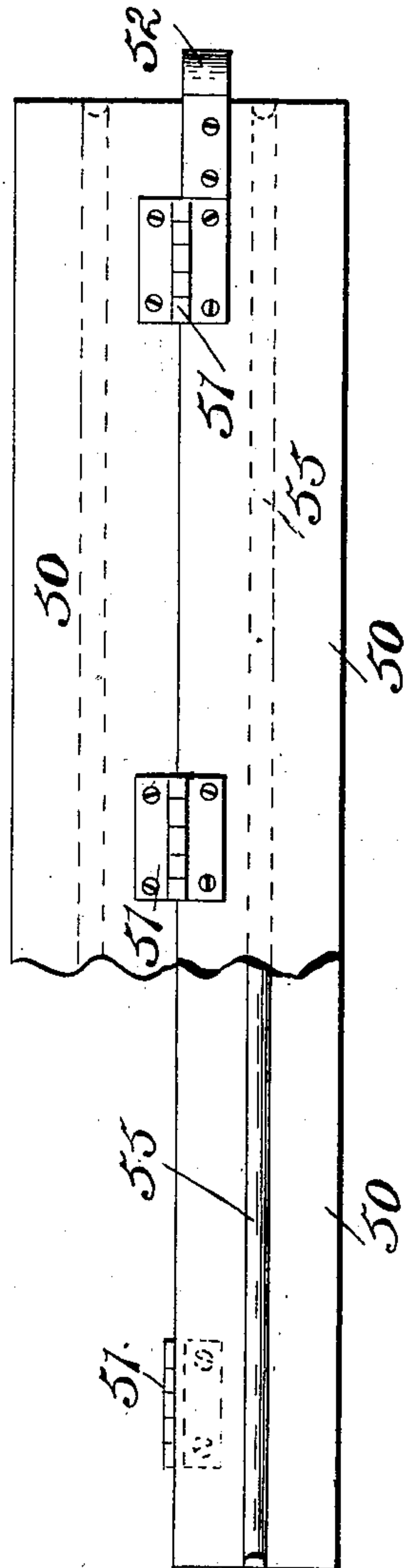
(No Model.)

3 Sheets—Sheet 1.



Witnesses:
Geo. E. Trech.
R. P. Henick

Fig. 4.



Inventor:
Burdett B. Briggs,
by *Collamer & Co.,*
Attorneys

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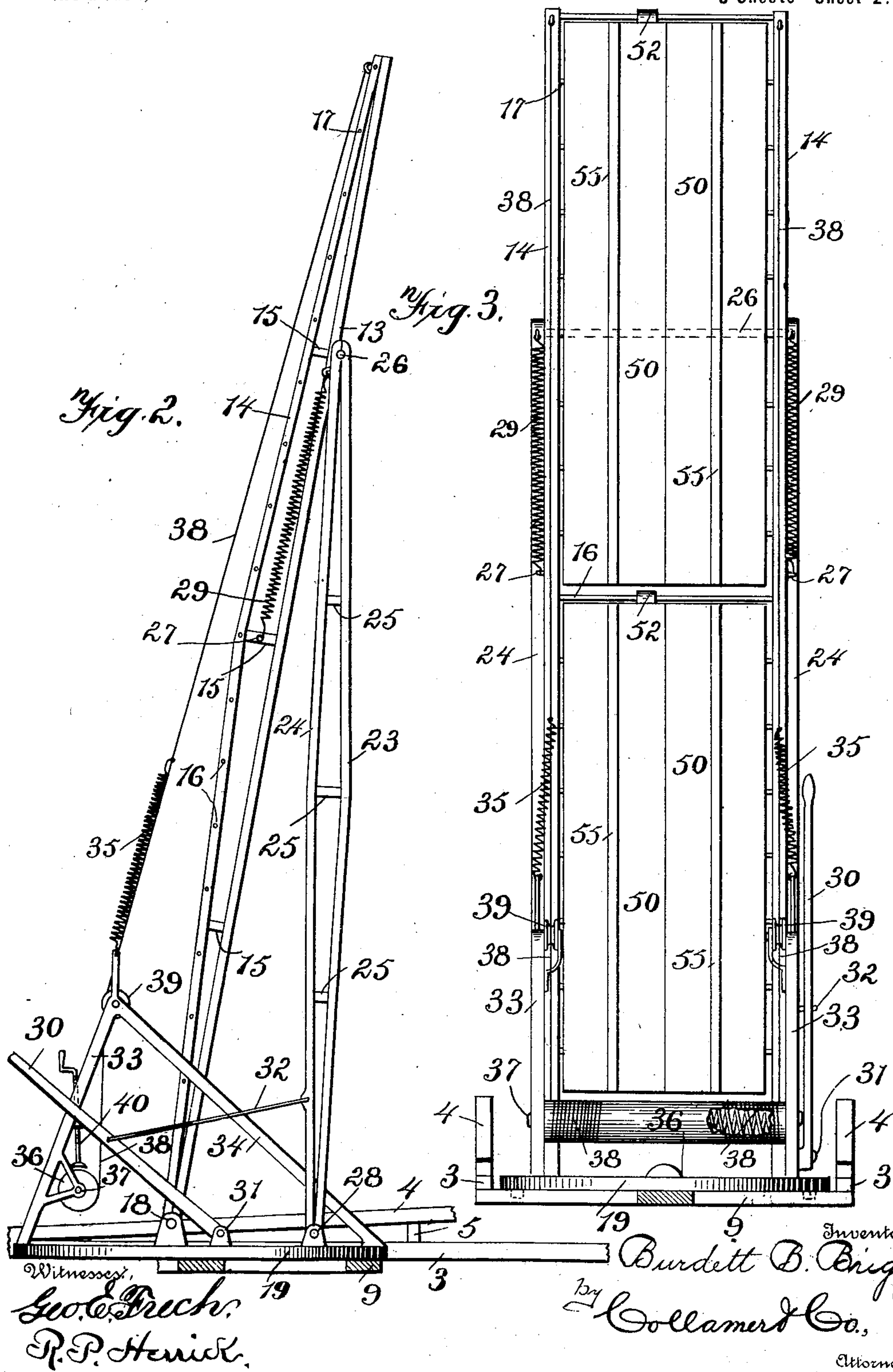
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3 Sheets—Sheet 2.



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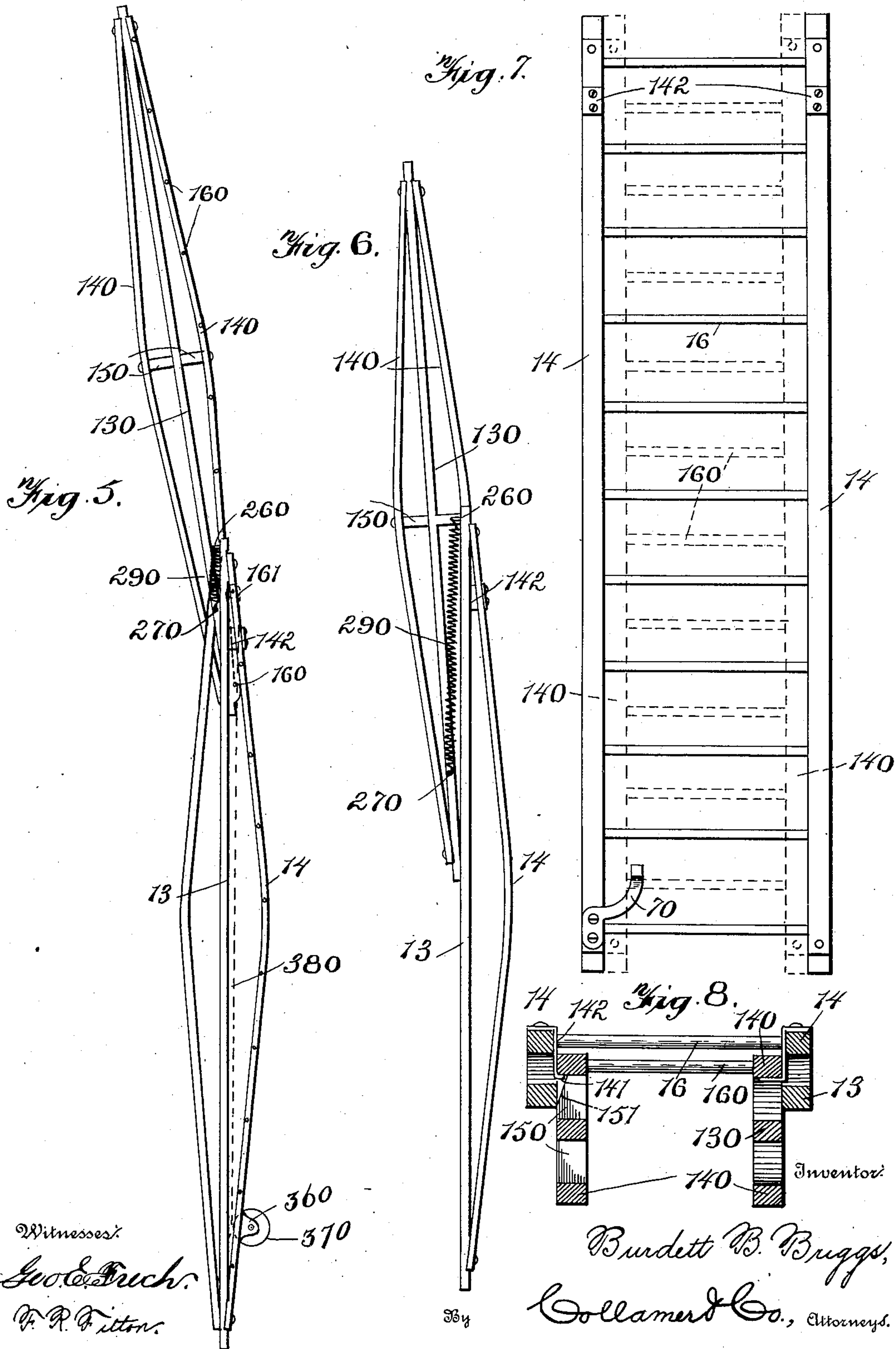
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3 Sheets—Sheet 3.



UNITED STATES PATENT OFFICE.

BURDETT B. BRIGGS, OF CRESTON, IOWA.

FIRE-ESCAPE.

SPECIFICATION forming part of Letters Patent No. 672,998, dated April 30, 1901.

Application filed March 27, 1900. Serial No. 10,381. (No model.)

To all whom it may concern:

Be it known that I, BURDETT B. BRIGGS, a citizen of the United States, and a resident of Creston, Union county, State of Iowa, have
5 invented certain new and useful Improvements in Fire-Escapes; and my preferred manner of carrying out the invention is set forth in the following full, clear, and exact description, terminating with claims particularly specifying the novelty.

10 This invention relates to ladders, more especially to that kind which are mounted on trucks; and the object of the same is to produce an improved fire-escape of this general character.

15 To this end the invention consists in the details of construction hereinafter more fully described and claimed and as shown in the accompanying drawings, wherein—

20 Figure 1 is a left side elevation of the entire device, the ladder being lowered upon the truck. Fig. 2 is a left side elevation of the truck-frame removed from its running-gear and the brace and ladder raised, certain parts
25 being in section. Fig. 3 is a front elevation of the device with the ladder raised and the chute hung thereon, the truck and truck-frame being omitted. Fig. 4 is a detail of the back of the chute, showing the lower end of
30 one wing broken and folded over onto the other. Fig. 5 is a side elevation showing my improved ladder in two sections which are distended and illustrating a spring-drum mounted on the main section and a rope lead-
35 ing thence to the upper section. Fig. 6 is a similar view with the upper section partially housed within the lower. This view shows the raising-spring on the near side as partially distended. Fig. 7 is a plan view of
40 these two sections housed or nested. For the sake of clearness of illustration the drum and raising ropes and springs are omitted from this view and the smaller or inner section is shown in dotted lines. Fig. 8 is a sectional
45 detail showing the manner in which the upper section is guided within the lower.

Referring to the drawings, 1 1 designate the wheels of a truck, such as usually forms part of the fire equipment of large cities, and the
50 only detail of this truck shown herein is the footboard 2. I construct the truck body and frame in what I consider an improved man-

ner. Each side consists of a straight sill 3 at the bottom, an upwardly-bowed truss 4, connected at its extremities to the ends of the
55 sill, and a series of struts 5, holding these members apart. The two sills are connected by occasional cross-rods or braces 9 in a manner which will be clear, and the rear end of the entire truck-frame carries a support 6,
60 having a spring-catch 7 for engaging the ladder when lowered, as described below. It will be clear that between the trusses 4 the ladder and its brace can lie within the truck-frame, as seen in Fig. 2, thus economizing in
65 space and weight and yet preventing sagging of the truck-frame.

The main ladder is constructed very much like the truck-frame. It has at each side a straight tie-rod or tie-bar 13 at the bottom,
70 whose ends are connected with the extremities of an upwardly-bowed leg 14, held away from the bar by interposed struts 15. There is one important difference, however, and that is that the rungs 16 connect the upper parts
75 of the sides instead of the lower. This makes the strain on the straight tie-bars or tie-rods a longitudinal pull instead of a transverse breaking strain. One of the upper rungs 17
80 itself engages the catch 7 or may have a keeper for this purpose. The lower end of the ladder is hinged, as at 18, to a turn-table 19, supported in any suitable manner by the truck-frame at a point about above the front axle.
85 The brace is constructed in a somewhat similar manner. Each side piece is in two members 23 24, connected at their extremities and both deflected at their centers out of a true straight line between said extremities, one or
90 more struts 25 being interposed to preserve the elongated diamond shape. The two sides of the brace need not be connected, as the outer ends are joined by a cross-rod 26, sliding under the straight lower edge of the ladder, and their inner ends are pivoted, as at
95 28, to the turn-table at points somewhat remote thereon from the pivot 18 of the ladder, as seen in Fig. 2. The brace as a whole is wider than the ladder, so that the side pieces of the two members do not interfere with each
100 other.

29 represents springs connecting the outer ends of the braces (or the cross-rod 26) with eyes 27 in the outer faces of the sides of the

ladder and located at such points that the springs will be under tension when the ladder is down and the cross-rod is slipped outward beneath it; but this tension will decrease as the ladder rises and the rod slips inward toward said eyes.

The springs last mentioned form one of several different means cooperating with each other to assist in raising the ladder; but the positive means for this same purpose, as well as for lowering the ladder when desired, is a hand-lever 30, pivoted at 31 to any suitable support on the turn-table and having a rod 32 connecting it with the corresponding brace. Only one of these is shown in the side elevation in Fig. 1; but it is clear there could be another hand-lever at the other side.

33 and 34 are parts of uprights rising from the turn-table and having pulleys 39 at their upper ends.

36 is a drum mounted in bearings 37 on the turn-table or upright and containing a spring which turns the drum in the direction tending to wind up ropes 38, which lead over pulleys 39 and alongside the ladder to its outer end, and, finally, a fourth means assisting in raising this ladder consists of a pair of springs 35, secured at one extremity to the upright and at their other extremities to such points on said ropes 38 that the springs will be under tension when the ladder is down and will contract as it is raised. It should be noted that as the ladder rises and its effective weight grows less and less the two sets of contractile springs become less effective, while the coiled spring in the drum also becomes less effective, but the hand-lever increases in efficiency.

40 is a brake of any suitable pattern, which may be employed to retard the drum if it should have a tendency to wind too rapidly. Means well known may be employed for regulating the tension of the spring in the drum. I have shown the drum partially in section in Fig. 3 and lay no claim to this drum, except in conjunction with the other devices, as it is clear that a drum operated by a windlass mechanism might be employed. However, I prefer a drum which will wind automatically.

In Figs. 3 and 4 I have shown a chute which consists of two wings 50, hinged together edge to edge on their backs, as at 51, and one of them having on its back at its upper end a hook 52, facing to the rear and adapted to pass over the upper end of the other wing as the latter is folded to bring the whole into small compass. Down the front of each wing leads a rib or rail 55, as best seen in Fig. 3. When this chute is hooked upon the ladder, as therein shown, and the ladder stands at a considerable incline, domestic goods can be slid down the chute or an insensible person could be lowered down it by a rope. There are twice as many sections of the chute as there are sections of the ladder on account of the fact that the rungs 16 are not all in per-

fect alinement, but are arranged in two banks slightly oblique to each other.

In Figs. 5 to 8 I have shown how my improved ladder may be made in telescoping sections, each of which possesses the details of construction above set forth. In these views the inner or upper section of the ladder consists of a straight bar 130, here shown as having two legs 140, connected at their extremities with the bar and with their centers possibly held away from the same by struts 150, while the rungs 160 connect the upper pair of legs. The latter slide under the rungs 16 of the lower section and between its sides, and they move over hooks 141 at the lower ends of guides 142, secured upon the legs 14 of the lower section, and the upper struts 150 (if employed) are notched, as at 151, to permit the hooks to pass them. The curvature of the legs 14 and 140 is about the same, so that as the upper ladder-section descends from the position shown in Fig. 5 past that shown in Fig. 6 and to that shown in Fig. 7 any given point at the lower end of the bar 130 of the upper section will travel straight down alongside the bar 13 of the lower section. At such point 270 at each side of the upper section is attached one end of a contractile spring 290, whose upper end is attached at a point 260 beneath the upper extremity of the lower ladder-section, from which construction it will be apparent in Fig. 6 that as the upper ladder-section descends the spring will be brought under tension.

While any suitable means may be employed for raising or distending the upper ladder section or sections, I have indicated in Fig. 5 a spring-drum 360, preferably journaled in bearings 370 on the legs 14, from which drum lead ropes 380, which pass upward and over pulleys 161 at the upper end of the lower ladder-section and thence downward and are attached to the lower rung 160 of the upper ladder-section. The contractile tendency of the springs 290 added to the power of this drum will perhaps all but raise the upper ladder-section and but little manual assistance need be employed. When the entire ladder is down, as seen in Fig. 1, the upper section would be automatically and undesirably distended, and I therefore preferably employ a spring-catch 70 for engaging one of its rungs to hold it in nested position.

In the views on Sheet 3 illustrative of the upper ladder-section I have shown the lower or main section following the construction of Fig. 2, though it will be clear that each side of this section might consist of a straight tie-bar or tie-rod with two outwardly-bowed legs 14, the second of which is shown in Fig. 5; but it will be clear that one of the legs 140 thereof might be omitted. Although the view illustrates but two telescoping ladder-sections, it will be clear that there could be more. Especial merit is claimed herein for making each part of this entire device, such as the ladder-

sections or the brace, of a straight tie-bar or tie-rod with one or two outwardly-bowed legs and with or without interposed struts. It will be clearly seen from Fig. 5 that when the various sections of a telescoping ladder made in this manner are distended and the rungs connect the legs instead of the straight members the ladder in side elevation has a certain curvature which adapts it especially to use in fires when the truck cannot be brought very close to the burning building and the ladder itself must span the intervening space. Again, in housing or nesting the various sections when thus constructed each upper section moves within the one next below in the manner described above, and this permits the use of raising-springs, which is especially desirable.

I do not confine myself to the sizes, shapes, proportions, or materials of parts nor limit myself to the precise construction herein.

What I claim as new is—

1. In a fire-escape apparatus, the combination with the truck and its frame, a turn-table carried by one end thereof, and a support at its other end having a catch; of a ladder hinged on the turn-table and adapted to engage said catch when the ladder is down, a brace pivoted at one end to the turn-table and having a cross-rod at its other end moving under the ladder, a hand-lever pivoted to the turn-table, a rod connecting this lever with the brace, and three additional independent mechanisms for assisting in raising the ladder, all as and for the purpose set forth.

2. The combination with a support, a ladder hinged at one point thereto; a pair of braces each hinged at one end at another point to the support, a cross-rod connecting their other ends and standing beneath the ladder, and springs attached to the outer ends of the braces and to the ladder at points to bring them under tension when the ladder is down, said springs standing substantially parallel with the ladder; of manual and independent automatic means carried by the support for assisting said springs in raising the ladder, all substantially as described.

3. The combination with a support, a ladder and a brace hinged thereon at different points, the outer end of the brace moving under the ladder; of manual and automatic means for assisting the rise of the brace and with it the ladder, uprights on the support, pulleys thereon, a drum also carried by the uprights, ropes leading thence over said pulleys to the upper end of the ladder, and springs connecting the uprights with points on the ropes which will keep them under tension when the ladder is down, all substantially as described.

4. The combination with a support, a ladder and a brace hinged thereon at different points, the outer end of the brace moving under the ladder; of manual and automatic means for assisting the rise of the brace and with it the ladder, uprights on the support,

pulleys thereon, a spring-drum, a brake for controlling it, and ropes leading around the drum, thence over said pulleys, and to the remote end of the ladder, all substantially as described.

5. A fire-escape ladder, of which the sides have each a straight lower tie-rod or tie-bar, upwardly-bowed legs connected at their ends with the ends of said bar, and several interposed struts; and the rungs connecting said legs, all substantially as described.

6. A fire-escape ladder comprising two sides each consisting of a straight bar, two legs connected at their ends therewith and having their centers bowed oppositely outward therefrom, and interposed struts; and transverse rungs between one pair of legs, substantially as described.

7. A fire-escape consisting of a ladder; combined with a chute made in sections detachably connected with the ladder and having longitudinal ribs on their faces, as and for the purpose set forth.

8. A fire-escape consisting of a ladder; combined with a chute made in sections detachably connected with the ladder, each section being hinged on a longitudinal medial line, substantially as described.

9. A fire-escape consisting of a ladder; combined with a chute comprising two wings having flat backs hinged at their meeting edges, the back of one wing having a hook projecting above the chute, and the face of both wings having longitudinal ribs or rails, as and for the purpose set forth.

10. In a fire-escape, the combination with a ladder pivotally mounted on a support, uprights rising from the support, pulleys mounted thereon, a drum journaled in bearings on said uprights, means for turning it automatically in one direction, and ropes wound on the drum and passing over pulleys and connected with the ladder; of independent mechanisms for positively raising and for assisting in raising the ladder, all substantially as described.

11. In a fire-escape, the combination with a ladder pivotally mounted on a support, a drum also thereon, and ropes leading from the drum to the ladder for raising it; of springs connecting fixed points on the support with points in said ropes and adapted to assist in the elevation of the ladder, all substantially as described.

12. A fire-escape ladder comprising several sections movable one upon the other and all adapted to be housed within the length of one; combined with a spring-drum mounted in bearings on one section, ropes leading from this drum over pulleys on this section and attached to another, and means for automatically assisting the distention of the sections, as and for the purpose set forth.

13. A fire-escape ladder comprising a plurality of sections movable one upon another and adapted to be housed within the length of one; combined with a raising-spring inter-

posed between each two contiguous sections and connected at its extremities thereto so as to be under tension when the sections are housed, substantially as described.

- 5 14. A fire-escape ladder comprising a plurality of sections which have at each side a straight tie-bar, an upwardly-bowed leg connected at its extremities to the tie-bar, and rungs connecting the legs, the legs of an upper section sliding beneath the rungs of a section next below whereby points on the upper section move alongside the tie-bars of the lower, and contractile springs connecting said points with the upper end of the lower
10 section, substantially as described.

15 15. In a fire-escape apparatus, the combination with the truck; of the ladder pivot-

ally supported thereon and consisting of sections each having at each side a straight tie-bar and an upwardly-bowed leg attached at its ends thereto, and rungs connecting said legs, means for distending said sections whereby the rungs will be brought into a curved path from the bottom to the top of the ladder, and means for raising and lowering the latter, substantially as and for the purpose set forth. 20 25

In testimony whereof I have hereunto subscribed my signature this the 24th day of March, A. D. 1900.

BURDETT B. BRIGGS.

Witnesses:

JOHN G. WERREN,
WM. REDRUP.