

(No Model.)

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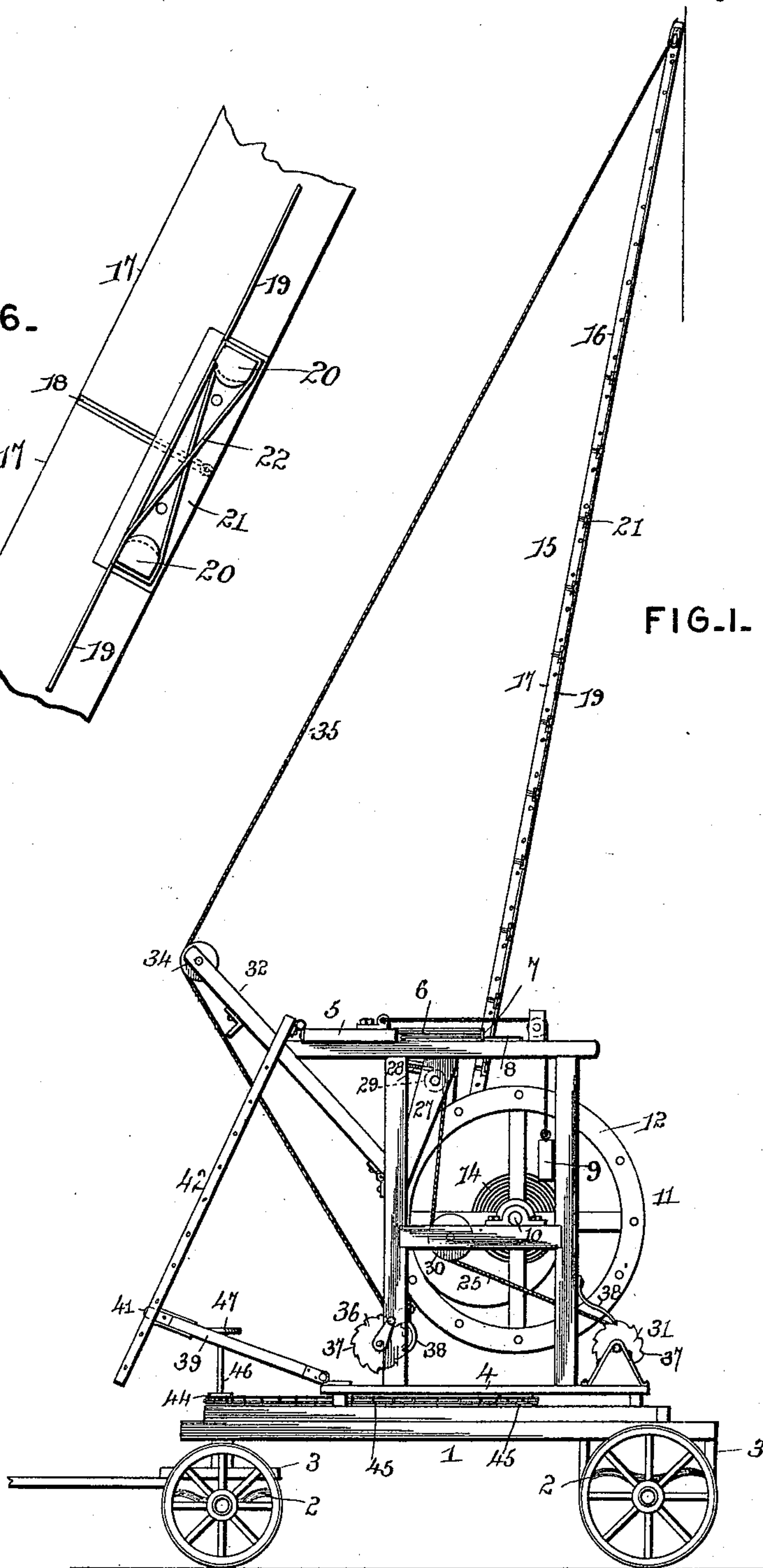
W. O. ELLIS.
FIRE ESCAPE LADDER.

No. 519,499.

Patented May 8, 1894.

FIG. 6.

FIG. 1.



Inventor

Witnesses

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By *J. H. McLaughlin* Attorneys.

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Cash & Co.

(No Model.)

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FIG. 2.

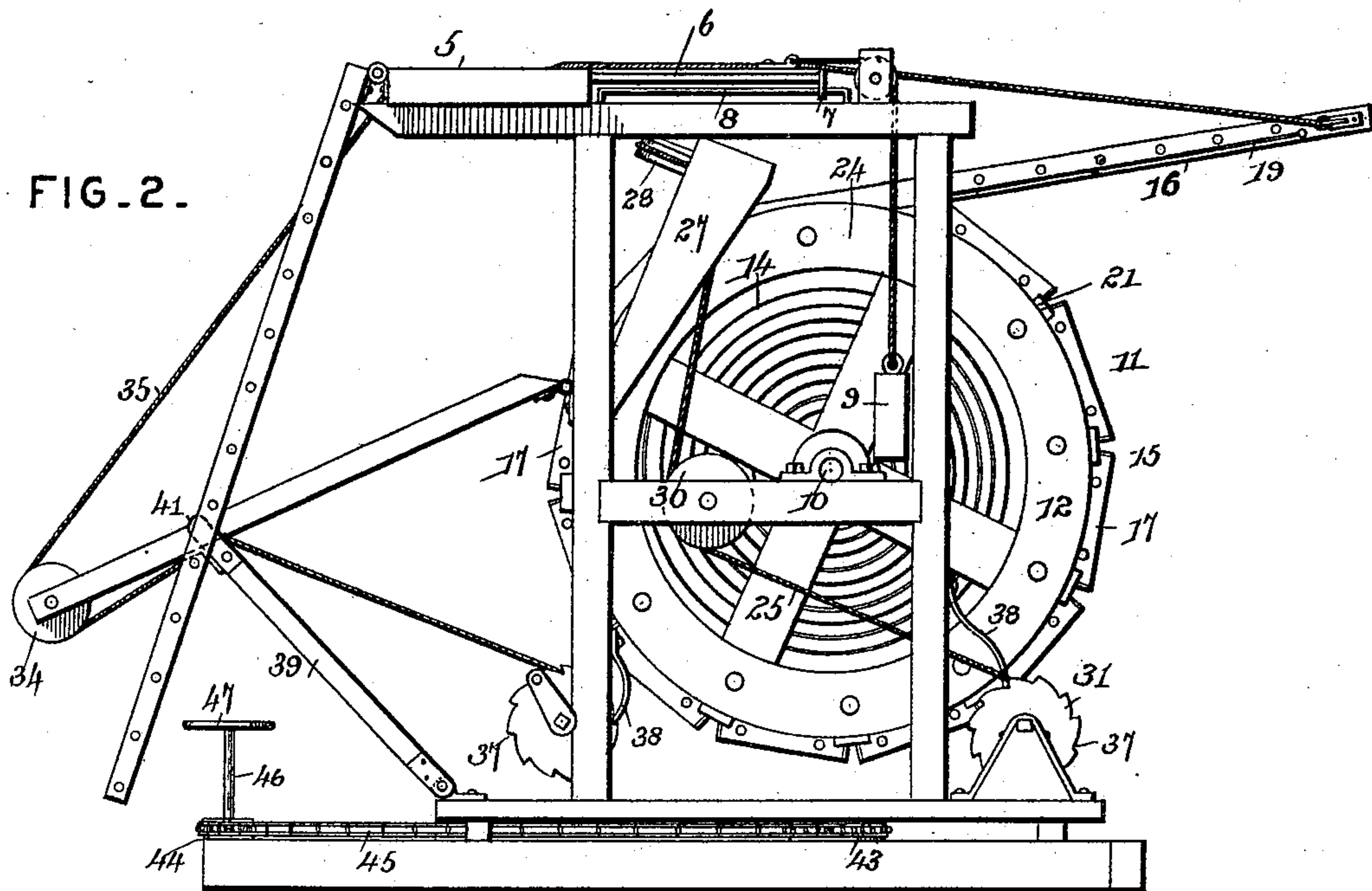
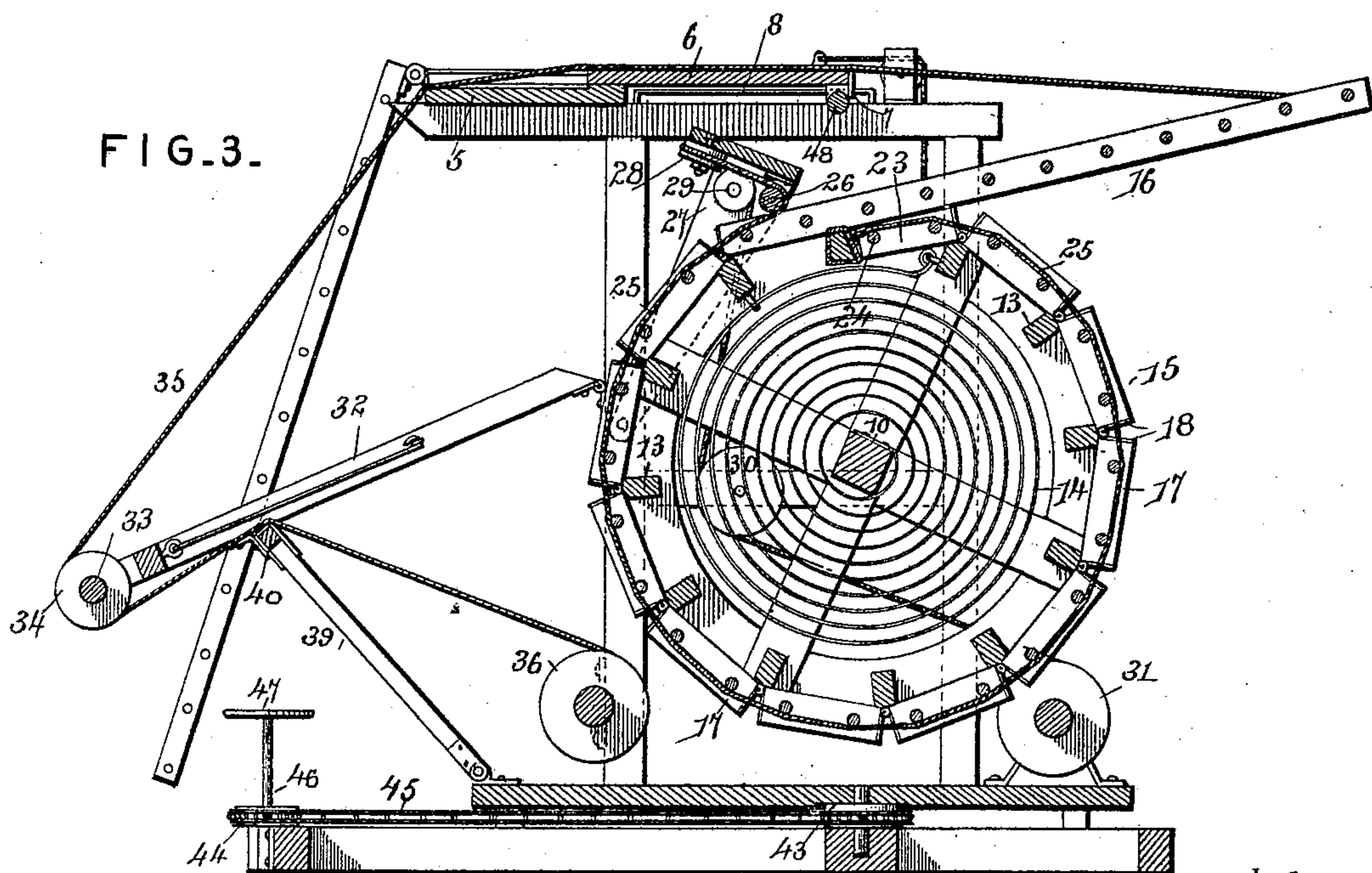


FIG. 3.



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FIG. 4.

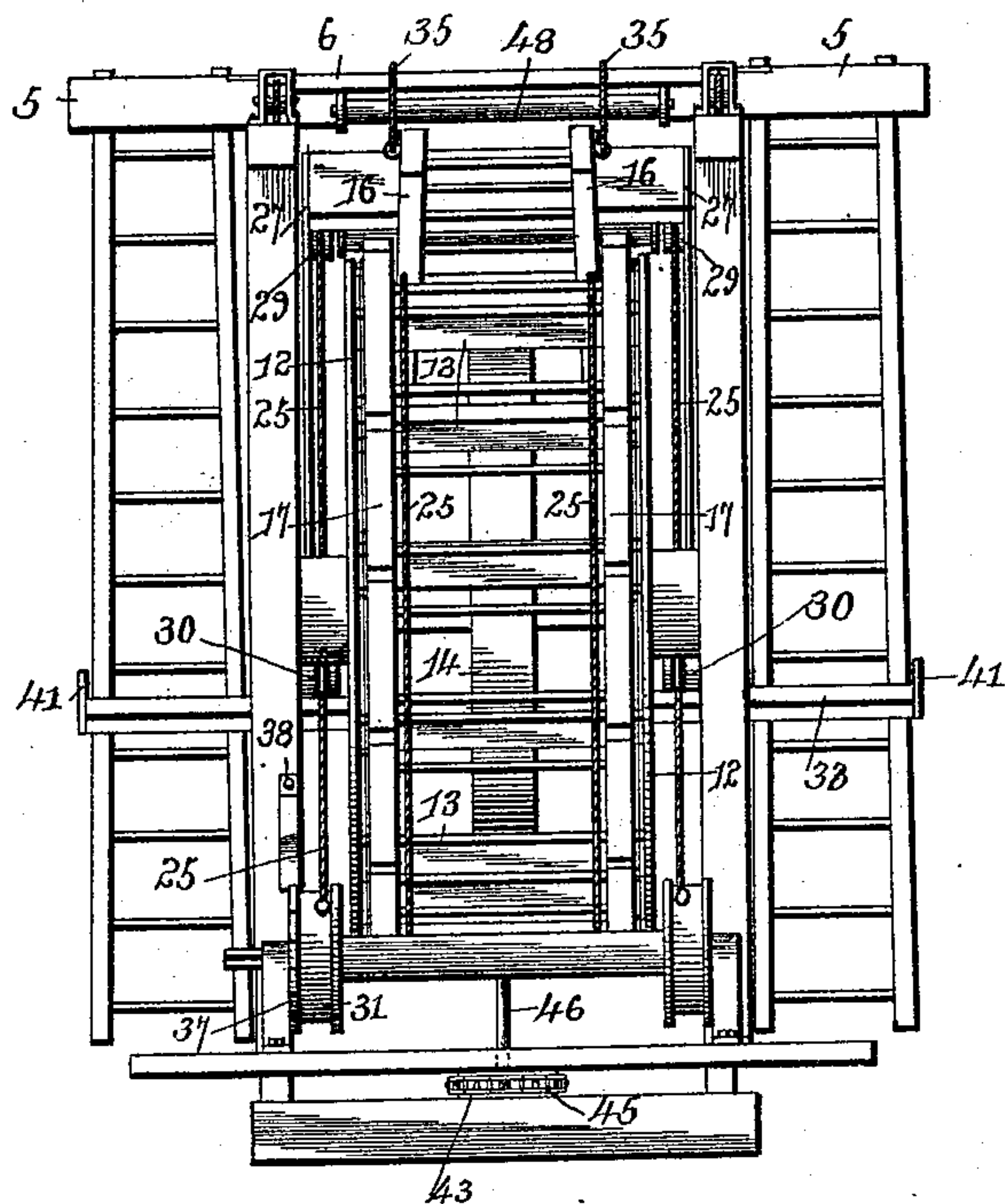
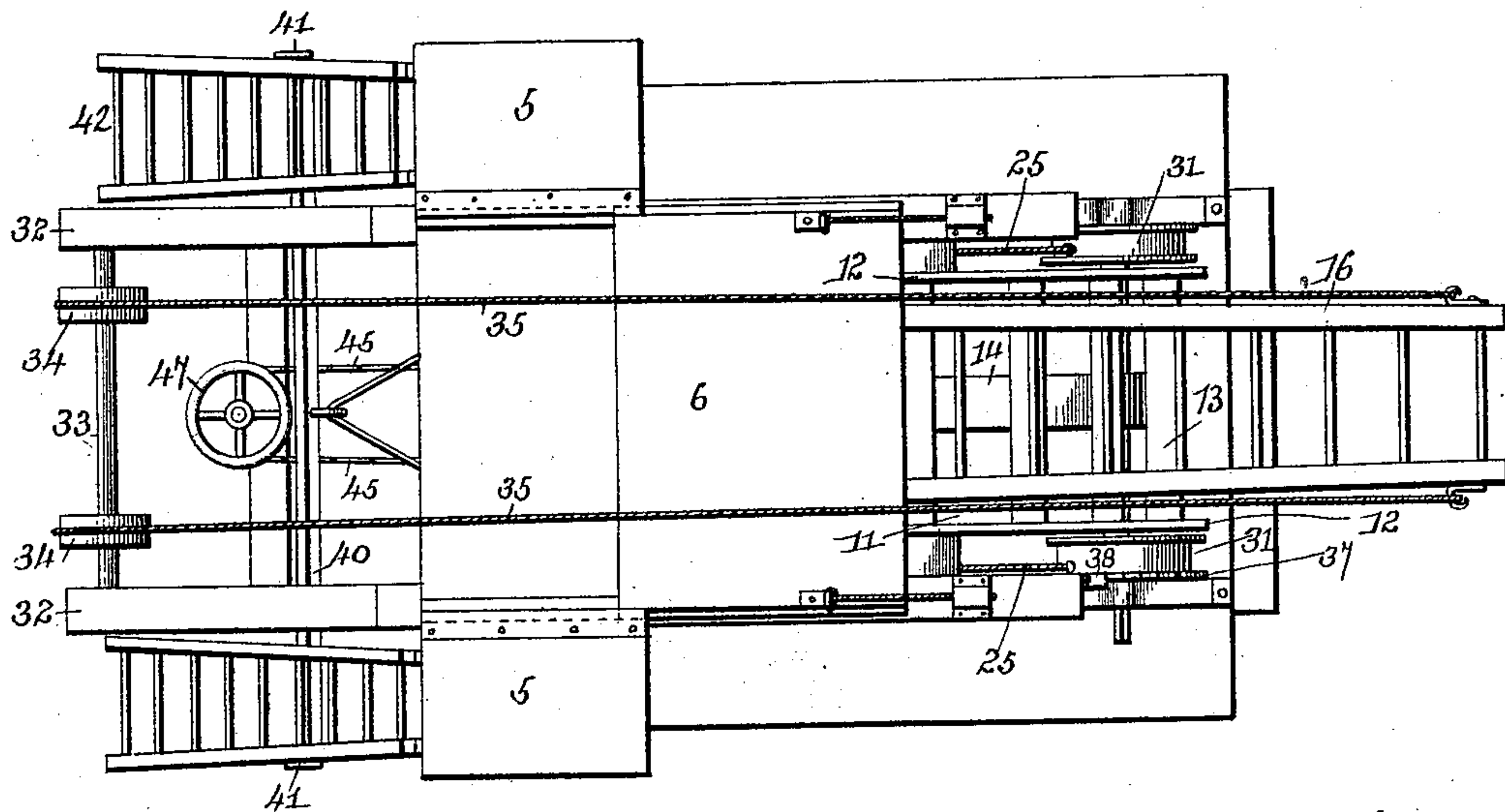


FIG. 5.



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UNITED STATES PATENT OFFICE.

WIATT ORVILL ELLIS, OF TEKOA, ASSIGNOR TO DAVID B. KEAGY, OF
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FIRE-ESCAPE LADDER.

SPECIFICATION forming part of Letters Patent No. 519,499, dated May 8, 1894.

Application filed August 31, 1893. Serial No. 484,494. (No model.)

To all whom it may concern:

Be it known that I, WIATT ORVILL ELLIS, a citizen of the United States, residing at Tekoa, in the county of Whitman and State of Washington, have invented a new and useful Fire-Escape Ladder, of which the following is a specification.

My invention relates to an improved fire-escape ladder, and it contemplates the provision of a jointed ladder adapted to be wound upon a drum which operates automatically to reel the same; furthermore, the provision of means whereby the entire fire-escape may be rotated to enable the upper end of the ladder to be adjusted without altering the positions of the trucks; furthermore, the provision of an automatically-adjustable landing which is held in operative relation to the jointed ladder in all positions of the latter; and furthermore, the provision of simple and efficient means for transporting, operating and bracing the parts of the improved fire-escape.

Further objects and advantages of the invention will appear in the following description, and the novel features thereof will be particularly pointed out in the appended claims.

In the drawings: Figure 1 is a side view of a fire-escape ladder embodying my invention, the ladder being extended. Fig. 2 is a similar view with the ladder reeled. Fig. 3 is a central vertical section of the device with the ladder reeled. Fig. 4 is a rear view. Fig. 5 is a plan view. Fig. 6 is a detail view of two connected sections of the ladder.

Similar numerals of reference indicate corresponding parts in all the figures of the drawings.

1 designates a supporting framework, which is connected by means of springs 2, to the trucks 3, and upon said framework is swiveled the rotary platform 4. Carried by this platform is a vertical frame or structure provided at its top with a fixed landing 5, and a slidable or adjustable portion 6, which overlaps an intermediate portion of the fixed landing, and is provided with eyes 7 fitted upon parallel guides 8. Connected to this movable portion of the landing are adjusting weights 9, whereby said adjustable portion is normally drawn toward the front of the structure.

Rotatably mounted upon a shaft 10, carried by the vertical frame or structure, is a drum 11, consisting of the circular side plates 12, connected by the transverse bars 13. Within this drum is arranged an actuating spring 14, which is fastened at its inner end to the shaft 10, and at its outer end to the bars 13, the tendency of such spring being to turn the drum in a direction to reel the jointed ladder 15 thereupon. Such ladder comprises an extended terminal section 16, and a series of connected shorter sections 17, the contiguous ends of which are connected by means of hinges 18. To strengthen the construction of the ladder I have also provided tension cables 19, arranged respectively upon the outer sides of the side-bars of the sections and extending continuously from one end of the ladder to the other. The cables are preferably of wire, and at each joint between connected sections it is cross-looped around laterally-projecting studs 20, carried respectively by contiguous ends of the sections. The studs 20 are carried by plates 21, secured to the side-bars close to their meeting ends, and the cross-loops 22, above referred to, are formed by carrying the cable across the joint between the sections, around the stud 20 carried by the far section, backwardly across the joint, and around the near stud and again across the joint to the succeeding ladder section. In this way each joint between the connected sections forming the ladder is tied, thus relieving the strain upon the hinges or other pivotal connections and guarding against accident in case of injury to any of these connections. It will be noted that the interval between the cross-bars 13, of the drum correspond with the lengths of the sections 17, whereby when the ladder is reeled it folds compactly around the drum. The inner terminal section 23 is pivotally connected to the drum by means of a pivot-rod 24, whereby the drum forms the base for the ladder, and being located below the plane of the landing, is out of the way of those ascending and descending, as will be clearly understood when the invention is more fully explained.

25 represents an operating cable, which is reeled around the drum upon the outer side

of the ladder, whereby it serves to hold the same in contact with the drum. This cable, after leaving the drum, passes around a transversely-disposed roller 26, which is carried 5 by a pivoted or swinging yoke 27, thence around an idle pulley 28, which is disposed in a horizontal position and is carried by the upper end of the yoke, a second vertically-disposed idle pulley 29 also carried by the 10 yoke, and a guide-pulley 30, which is mounted upon the upright frame of the ladder, and is connected to a windlass 31. This cable being reeled upon the drum in the same direction as the ladder, and in an opposite direction to the spring, it will be understood that 15 by reeling the opposite end of the cord by means of the windlass the drum will be turned against the tension of the spring and the ladder will be extended. The operating cable is preferably duplicated upon opposite sides of 20 the drum, as shown.

Pivotally connected to the rear standards of the upright frame is a stretcher-frame 32, provided with suitable braces 33, and carrying 25 guide-pulleys 34, around which extend the guy-ropes 35, connected at their upper ends to the free extremity of the terminal section 16 and reeled at their lower ends upon the windlass 36. The windlasses 31 30 and 36 are provided with ratchets 37 and engaging-pawls 38, to prevent them from turning in a direction to unreel the cords wound thereupon. The stretcher-frame is adapted to incline upwardly toward its free end and 35 bear against the end of the landing 5, when the ladder is in its operative position.

Pivotally connected to the rotary platform at its rear end is a brace 39, provided at its free end with a cross-timber 40, provided with 40 terminal studs 41, and ground-ladders 42 are hinged to the rear edge of the landing and are held in an inclined position by the said brace, as clearly shown in Fig. 1.

The rotary platform is provided concentric 45 with its pivot with a sprocket-wheel 43, around which and a corresponding sprocket 44 at the rear end of the supporting framework 1 extends a chain 45, the sprocket 44 being carried by a vertical spindle 46, provided with a 50 hand-wheel 47. By this means the rotary platform, with the superstructure above described, can be rotated freely by an operative to arrange the top of the ladder in the desired position with relation to a building without altering the position of the trucks upon 55 which the supporting framework is mounted.

With the parts in the folded position, shown in Fig. 2, the ladder may be extended by 60 slacking the guy-ropes and reeling the operating cables upon the windlass 31. As the ladder ascends its inclination may be adjusted by tightening or loosening the guy-ropes, and the adjustable section 6 of the landing, which is provided with an anti-friction roller 65 48, will maintain contact with the ladder and thus form an unbroken communication between the same and stationary part of the

landing. To reel the ladder the guy-ropes should be slackened slightly and the windlass 31 released in order to enable the actuating spring to rotate the drum. The slack 70 of the guy-ropes must be taken up by means of the windlass 36 as the ladder descends.

Various changes in the form, proportion, and the minor details of construction may be 75 resorted to without departing from the principle or sacrificing any of the advantages of this invention.

Having described the invention, what is 80 claimed is—

1. The combination with a supporting framework, of a rotary platform, an elevated landing carried by said platform, ground-ladders depending from the landing, an extensible ladder arranged adjacent to the landing, 85 and means for operating the ladder, substantially as specified.

2. The combination with a platform, of an elevated landing provided with an adjustable section, means connected to said section to 90 extend the same, a drum, a sectional ladder reeled upon the drum, and means for operating said parts, substantially as specified.

3. The combination with an upright framework, of a drum, a sectional ladder connected 95 to said drum to be reeled thereon, an actuating spring connected to the drum to rotate the latter in a direction to reel the ladder, and means for rotating the drum in an opposite direction and for bracing the ladder in 100 its extended position, substantially as specified.

4. In a fire escape, the combination of a spring-actuated drum, a jointed ladder connected to the drum to be reeled thereon, and 105 operating and bracing devices connected to said parts, substantially as specified.

5. The combination with a framework, an elevated landing, an extensible ladder terminating at said landing, and means for extending 110 and folding the ladder, of ground-ladders pivotally connected at their upper extremities to the said landing, and a brace 39 adjustably connected to the framework and adapted to engage said ladders near their 115 lower ends to hold them in inclined or operative positions, substantially as specified.

6. A sectional ladder having the contiguous ends of its sections hinged together, and a tension cable secured to the side-bars of the 120 sections and cross-looped over the said joints or connections, substantially as specified.

7. A sectional ladder having its sections hinged together, lateral studs carried respectively by the contiguous ends of connected 125 sections, and a continuous tension cable arranged upon each side of the ladder and cross-looped around said studs at each joint, substantially as specified.

8. The combination with a supporting 130 frame, of a rotary drum provided with an actuating spring, a jointed ladder reeled upon said drum, bracing devices connected to the ladder, a swinging yoke carrying a roller to

bear against the ladder as it leaves the drum,
an operating cable carried around guide-pul-
leys upon said yoke and connected to the
drum, and means for reeling and unreeling
5 the operating cables, substantially as speci-
fied.

In testimony that I claim the foregoing as

my own I have hereto affixed my signature in
the presence of two witnesses.

WIATT ORVILL ELLIS.

Witnesses:

DAVID B. KEAGY,
GUST. RENDSCHMIDT.