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Patented Jan. 16, 1900.

F. S. STEWARD.  
INCLINED ELEVATOR.

(Application filed Feb. 20, 1899.)

(No Model.)

2 Sheets—Sheet 1.

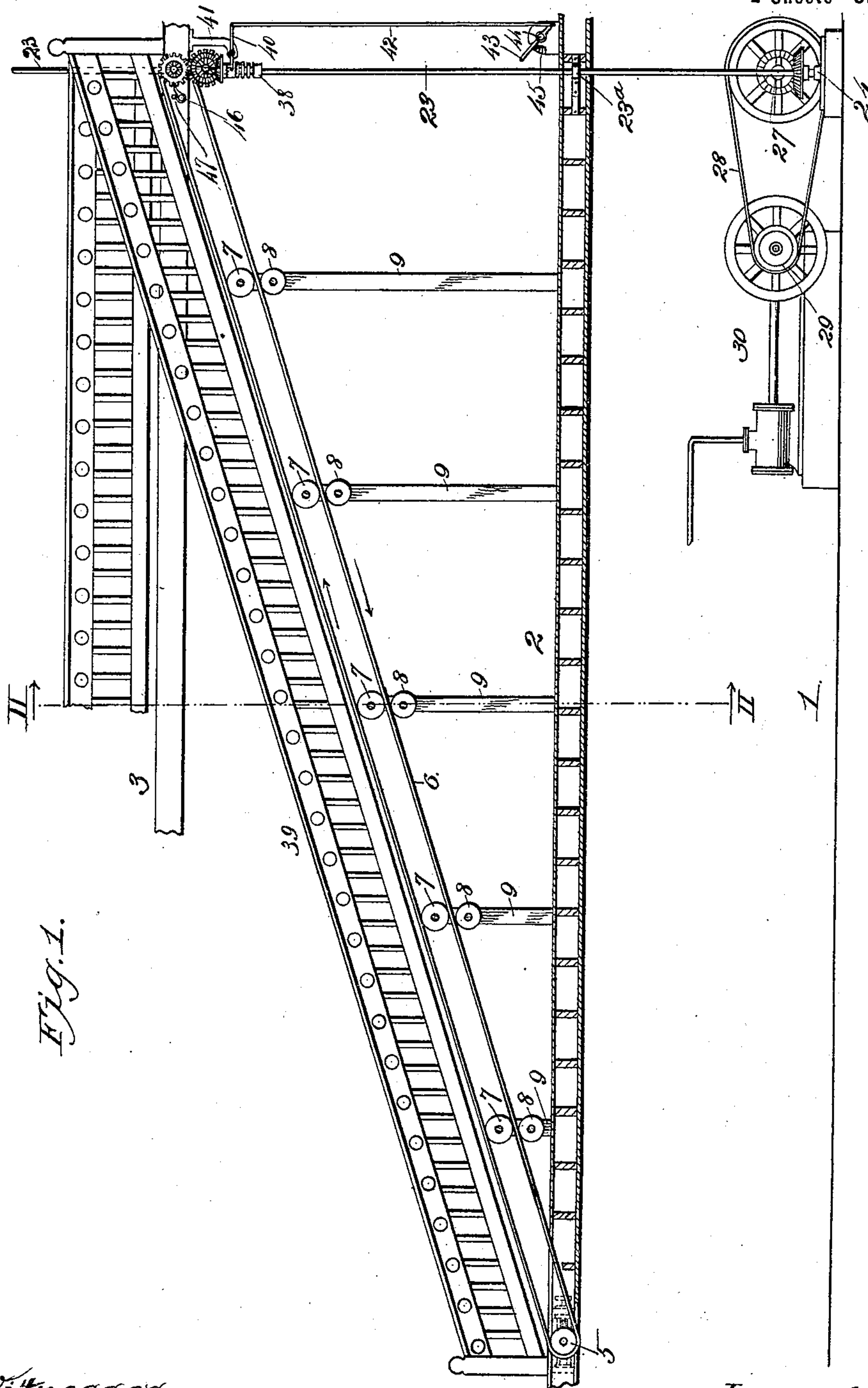


Fig. 1.

Witnesses.  
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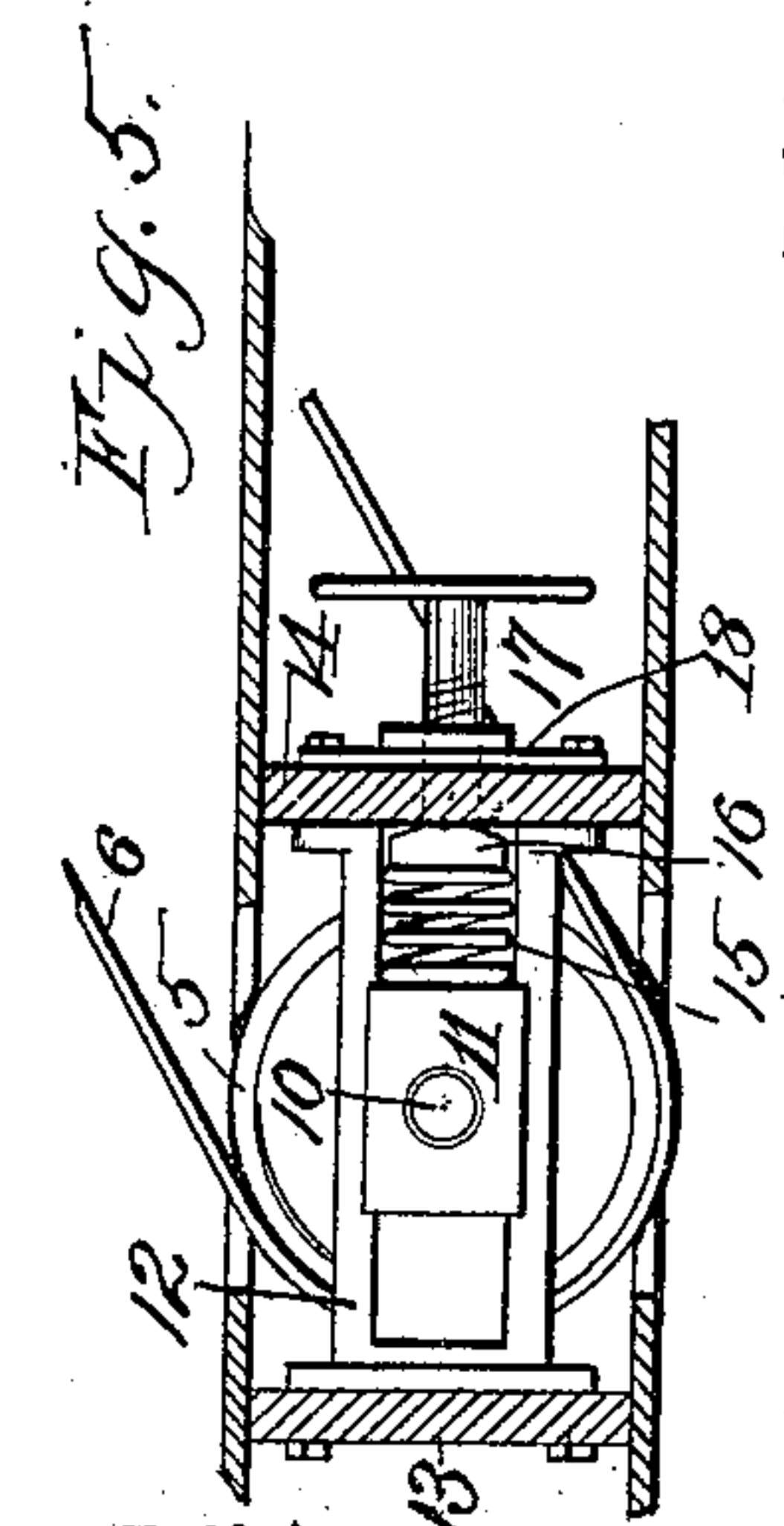
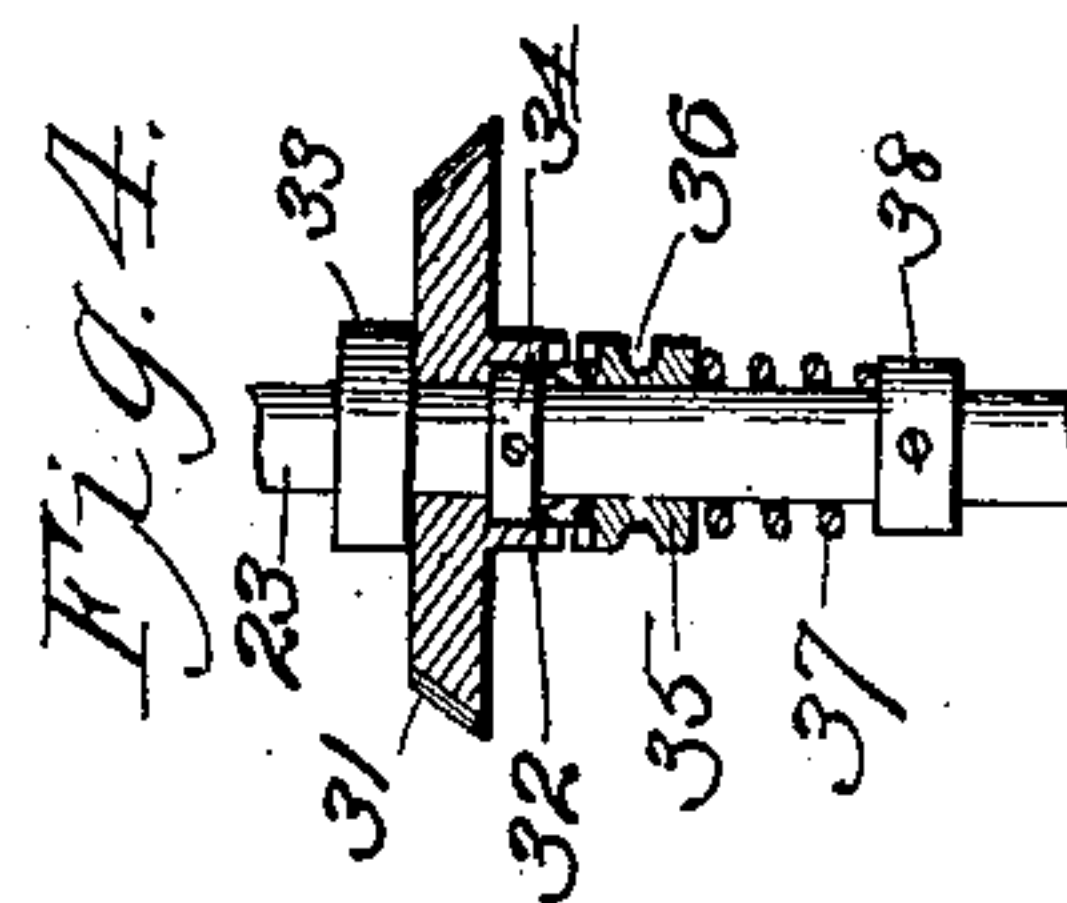
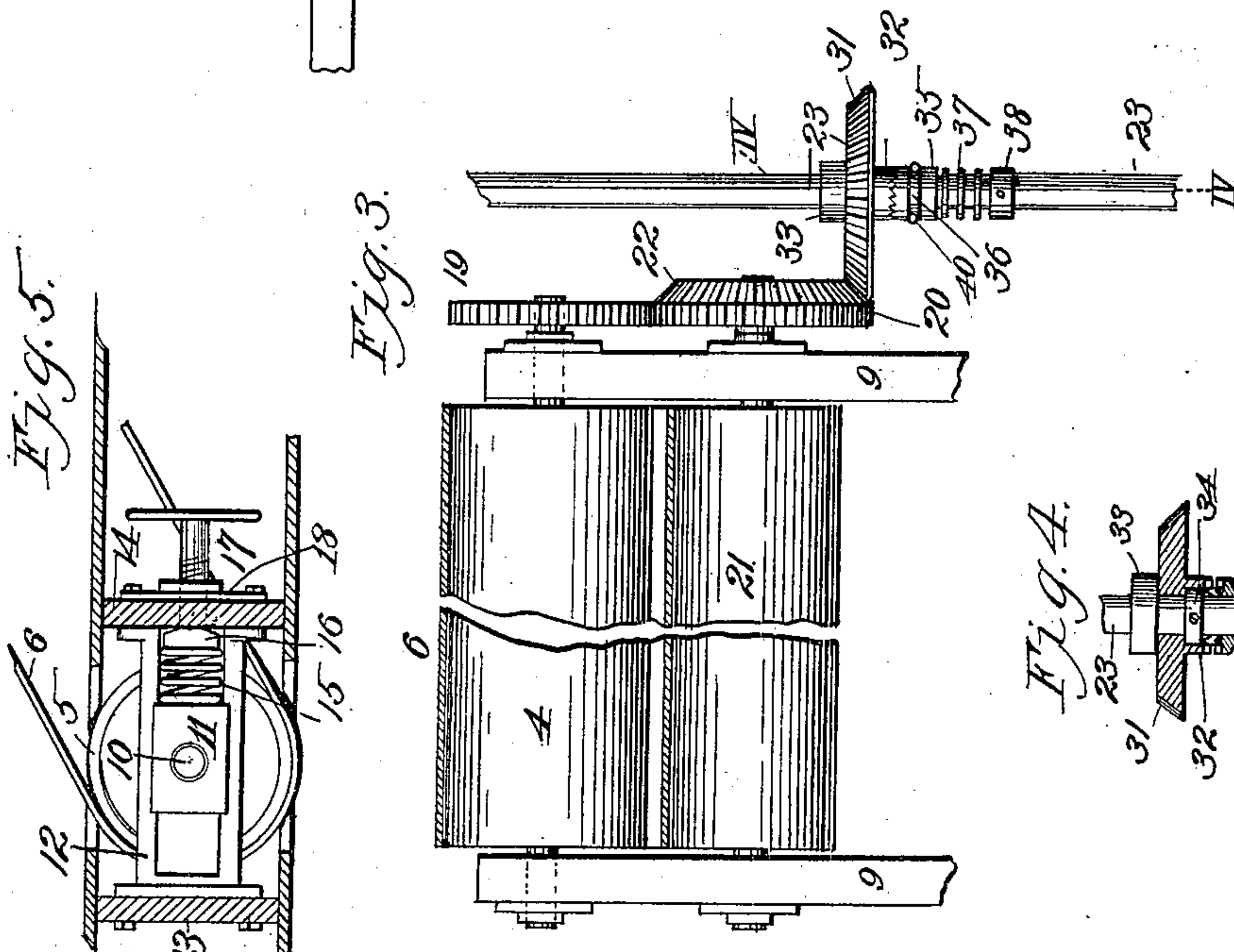
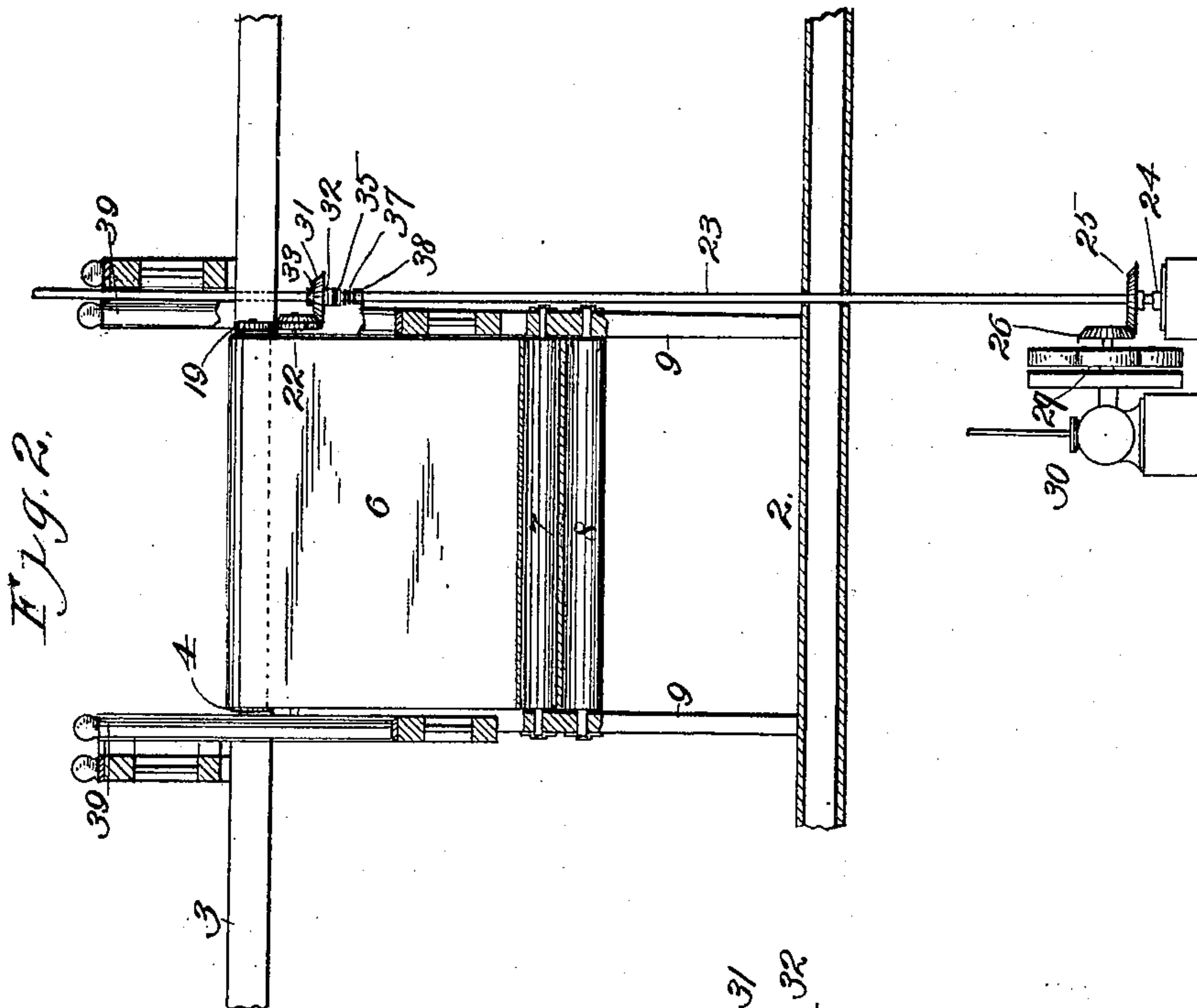
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# UNITED STATES PATENT OFFICE.

FREDRICK S. STEWARD, OF KANSAS CITY, MISSOURI.

## INCLINED ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 641,414, dated January 16, 1900.

Application filed February 20, 1899. Serial No. 706,106. (No model.)

*To all whom it may concern:*

Be it known that I, FREDRICK S. STEWARD, of Kansas City, Jackson county, Missouri, have invented certain new and useful Improvements in Inclined Elevators, of which the following is a specification.

My invention relates to inclined elevators for use in stores and other places where great crowds congregate and where time is secondary to the personal safety of those whose business requires their presence on different floors of the establishment, my object being to produce an inclined elevator whereby shoppers may be enabled to go from one floor to another with comfort and convenience, without exertion, and in perfect safety, a further object being to produce an elevator which is of simple, strong, durable, and inexpensive construction.

To this end the invention consists in certain novel and peculiar features of construction and combinations of parts, as will be hereinafter described and claimed, and in order that the invention may be fully understood reference is to be had to the accompanying drawings, in which—

Figure 1 represents a vertical section of a building, showing the first and second floors and the basement, with an inclined elevator extending from the first to the second floor and with an engine or other motor located in the basement and geared to the elevator in accordance with my invention. Fig. 2 is a cross-section taken on the line II II of Fig. 1. Fig. 3 is an enlarged vertical section showing the upper end of the elevator and the gearing by which movement is imparted to the same. Fig. 4 is a vertical section taken on the line IV IV of Fig. 3. Fig. 5 is an enlarged section showing the mechanism for adjusting the roller at the lower end of the inclined elevator and thereby tensioning the latter.

In the said drawings, 1 designates the basement, 2 the first floor, and 3 the second floor, of a building—such, for instance, as a large trading or department store—it being in houses of this character where a slowly-moving and entirely safe elevator can be used to the greatest advantage and where such a device is especially desirable owing to the immense crowds which frequent such places.

4 designates a roller which is suitably journaled with its upper side in the same plane as the adjacent floor, and 5 a similar roller which is located with its upper side in the same horizontal plane as the floor immediately below, and said rollers are connected by an endless elevator 6, of leather, rubber, canvas, or any other suitable material which possesses the requisite strength.

At suitable intervals throughout the length of the endless elevator are the vertically-alined rollers 7 and 8, journaled in suitable standards 9, the rollers 7 supporting the upper strand of the belt and the rollers 8 the lower strand, so that said strands shall extend in substantially parallel lines, and thereby render the tensioning of the elevator less difficult than it would otherwise be. The shaft 10 of the roller 5, hereinbefore referred to, is journaled in sliding boxes 11, dovetailed or otherwise mounted in the slotted guides 12, said guides being secured at their opposite ends to the stationary timbers 13 and 14.

15 designates heavy coiled springs of the expansive type, which are interposed between the rear ends of the sliding boxes 11 and the heads 16 of the adjusting-screws 17, said screws being mounted in castings 18, secured to the cross-timber 14. These boxes 11, springs 15, screws 17, and plates 18 are of course in duplicate, though only one of each appears in the drawings. (See Fig. 5.) By this arrangement it is obvious that the proper manipulation of the screws 17 will force the boxes 11 forward, and thereby tension the elevator by thus increasing the distance between rollers 4 and 5, as will be readily understood, and it will also be noticed that the springs 15 will yield to accommodate any exceptional weight which the elevator may be forced to sustain, and thereby practically obviate all chance of injury to the latter.

There will of course be as many of these elevators, less one, as there are floors in the building, and in order that they may be operated with the least possible expense they should be arranged vertically one above the other, with their rollers 4 in vertical alinement, and mounted upon the corresponding ends of the shafts of said rollers are gear-wheels 19, (see Figs. 1, 2, and 3,) which mesh



with the peripheral teeth of a bevel-gear 22, secured upon the shaft of the roller 21, arranged vertically below each roller 4, as shown in Fig. 3.

23 designates a vertical shaft which by preference extends from the basement to the top-most floor, where it is journaled in any suitable manner. At its lower end it is preferably journaled or stepped in the journal-box 24 and carries near the same a bevel gear-wheel 25, which meshes with a similar wheel 26, mounted upon a shaft suitably journaled, which shaft also carries a belt-wheel 27, connected by the belt 28 with the belt-pulley 29 of the motor 30. The motor may be in the form of a steam-engine, as shown, or of any other suitable type whereby motion may be conveniently imparted to the vertical shaft 23, it being understood, of course, that the special type of gearing described to transmit motion from the motor to said shaft is not essential.

31 designates bevel gear-wheels, in number corresponding to and continuously engaging the bevel gear-wheels 22, hereinbefore described, and each wheel 31 is formed with a depending clutch member 32 and is held at the proper point upon the shaft by means of the collars 33 and 34. (See Fig. 4.)

35 designates a clutch which is geared to slide but not to rotate upon the shaft 23, and said clutch member is provided with the usual annular groove 36 and is held normally in engagement with the clutch member 32 by means of the spiral expansion-spring 37, which encircles shaft 23 and bears at its lower end upon the collar 38, secured upon said shaft. When the vertical shaft 23 is in operation and said clutches in engagement, motion is imparted to the wheels 31 and, through the interposed gearing, to the endless elevators, as will be readily understood, this motion being adapted to cause the elevator to travel in the direction indicated by the arrows, Fig. 1, so that a person stepping upon the lower end of the elevator will be carried gradually upward and deposited upon the landing of the floor above, there being inclined railings 39 at the opposite sides of the elevator, which may be grasped lightly by the person upon the elevator in order that an upright position may be easily maintained, it being understood, of course, that it will be unnecessary to grasp the railing after one becomes accustomed to riding upon the elevator. These elevators of course are provided for purposes of ascent only, as walking downstairs or down a stationary incline at a suitable angle would require no special exertion, and, furthermore, a stairway or stationary incline could be built at much less expense than an inclined elevator for purposes of descent.

The movement of all the elevators of course may be controlled by the engineer in charge by stopping the engine or throwing the vertical shaft 23 out of gear therewith, or the elevator running to any particular floor may be

stopped when desired by means of mechanism constructed as follows:

40 designates a forked lever which is pivoted to a bracket 41, secured to the frame of the building in any suitable manner, (see Fig. 1,) with the fork of said lever engaging the annular groove 36 of clutch-segment 35 in order that the vertical operation of said lever shall slide said clutch-segment up or down, and therefore in or out of gear with the clutch 32 above without interfering with its rotatable action. This vertical movement may be imparted to said lever through the medium of the tie-rod 42 by the lever 43, pivoted to a plate 44, provided with a series of radial teeth 45, with one or another of which said lever is adapted to engage, and thereby lock the clutch member 35 in the required position, as will be readily understood, and to eliminate any possible chance of back rotation of the roller 4, and therefore of the endless elevator when not driven by the shaft 23, I employ a gravity-dog 46, which engages the successively-presented teeth of wheel 19 without interfering in the least with the rotation of said wheel in the proper direction, and in order to maintain this dog in the proper position for reliable engagement with said wheel a pin 47 is provided, which limits the distance which the dog may swing outward from the wheel.

From the above description it will be apparent that I have produced an inclined elevator for conveying passengers from one floor to another floor without any possible danger of an accident to the passengers and which, furthermore, embodies the advantageous features enumerated in the statement of invention, and it is to be understood that I reserve the right to make all changes which properly fall within the spirit and scope of the invention.

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

An inclined passenger-elevator extending from one floor of a building to another, comprising an inclined endless belt 6, a roller 5 engaged by said belt at its lower end, a drive-roller 4 engaging the upper end of the belt, a series of intermediate rollers 7 8 supporting the belt between said end rollers, a roller 21 below the drive-roller, intermeshing cog-wheels 19 20 secured upon the shafts of the drive-roller and roller 21 respectively, a beveled cog-wheel formed integral with cog-wheel 20, a driven shaft 23, a beveled cog-wheel 31 journaled thereon and meshing with the first-named beveled cog-wheel 22, a collar 33 upon the shaft above said journaled cog-wheel, a collar 34 upon the shaft below said cog-wheel, a clutch member 32 formed integral with said wheel, a companion clutch member 35 adapted to slide upon and rotate only with said shaft, and provided with an external groove 36, a collar 38 below the sliding clutch member, a spring 37 encircling the shaft and bearing against said collar and said sliding clutch



member, a bifurcated lever 40 engaging the  
groove of said sliding clutch member, a  
toothed sector 45, a lever 43 pivoted thereto  
and adapted to engage one or another of the  
5 teeth of the sector, and a link-rod 42 connect-  
ing said lever with the clutch member, sub-  
stantially as described.

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

FREDRICK S. STEWARD.

Witnesses:

M. R. REMLEY,  
HELEN RODGERS.