J. W. POGUE.

ELEVATOR MECHANISM.

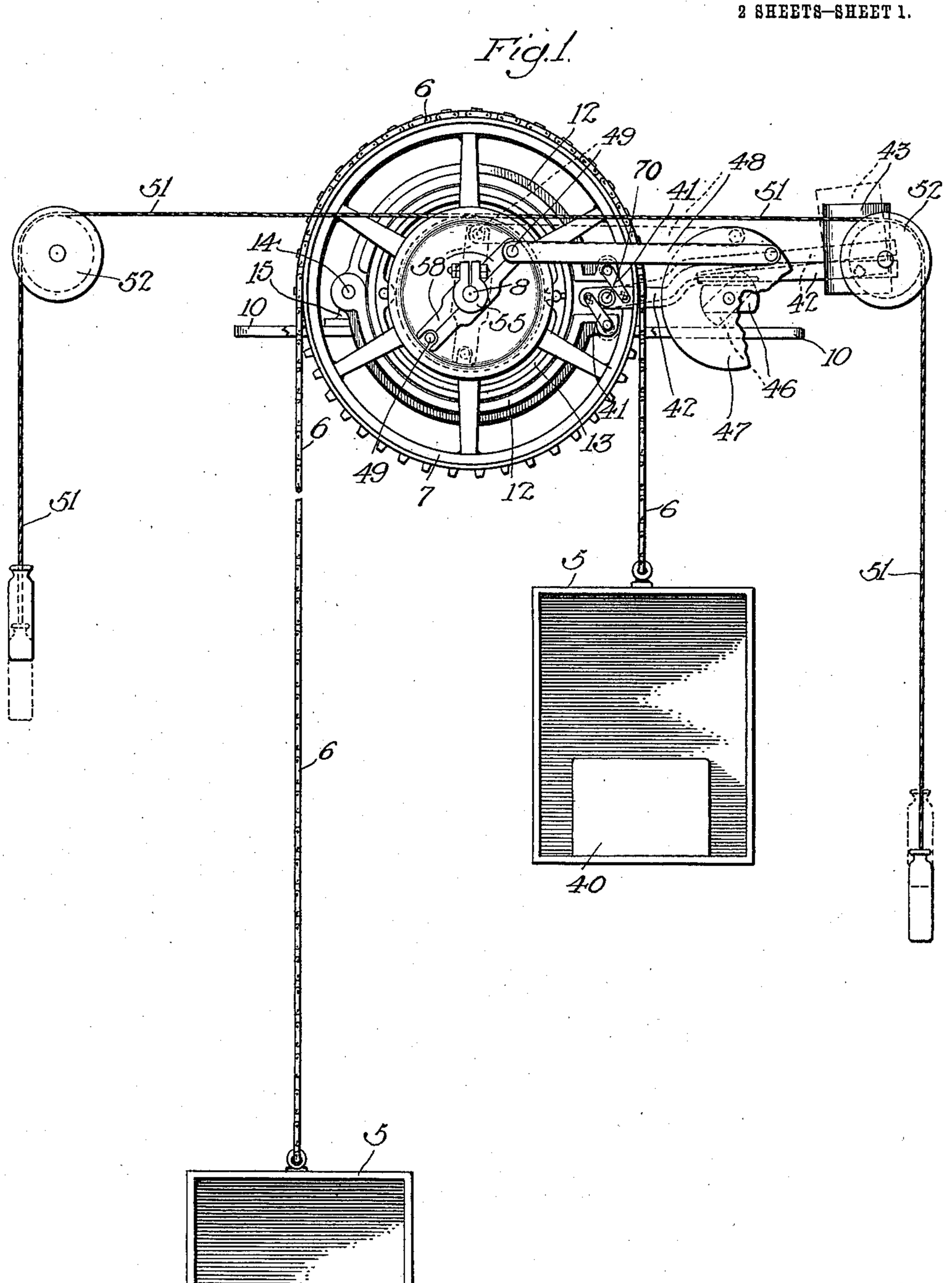
APPLICATION FILED SEPT. 7, 1909.

974,914.

Patented Nov. 8, 1910.

2 SHEETS—SHEET 1.

Fig. 1.



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2 SHEETS—SHEET 2.

Fig. 2.

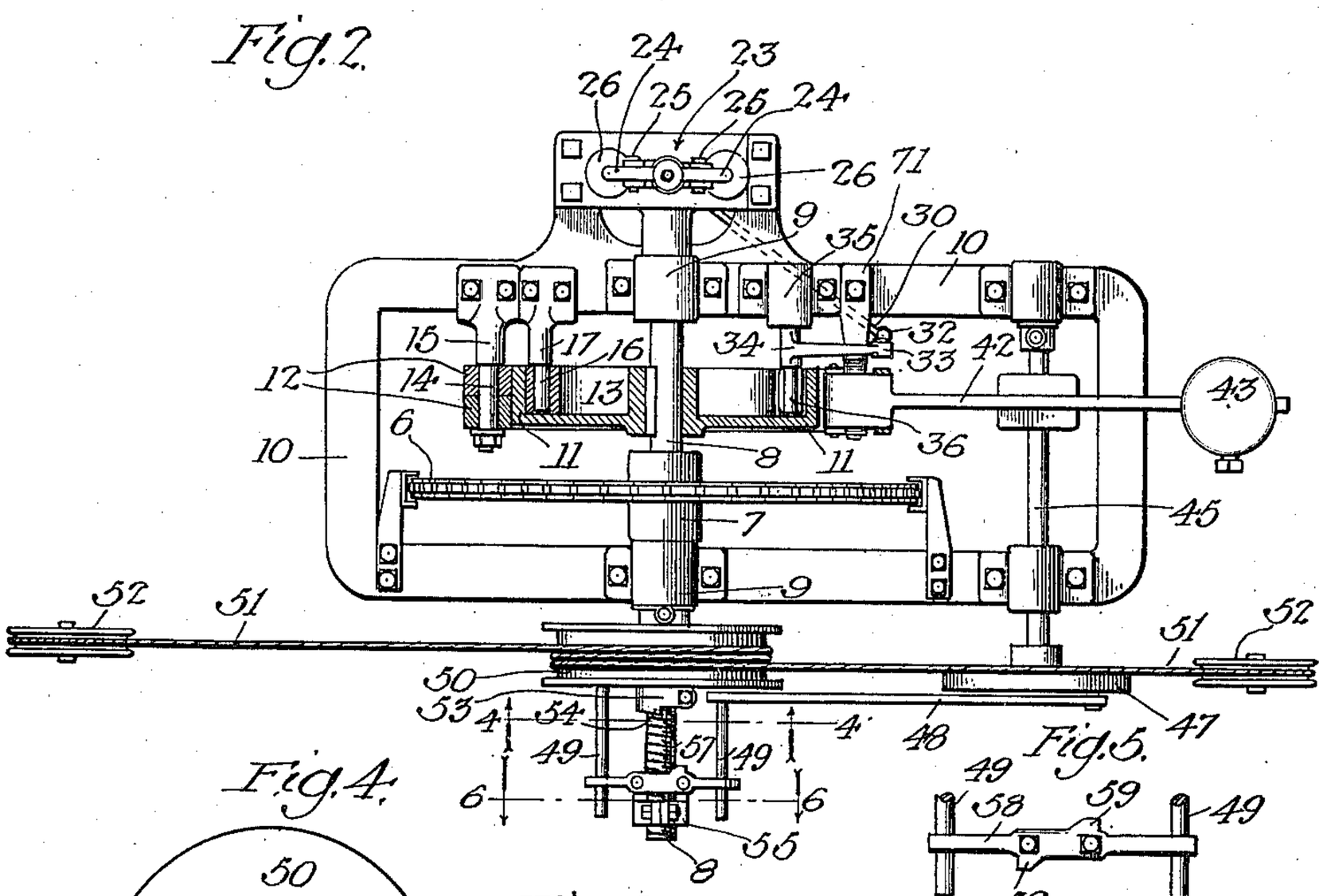


Fig. 4.

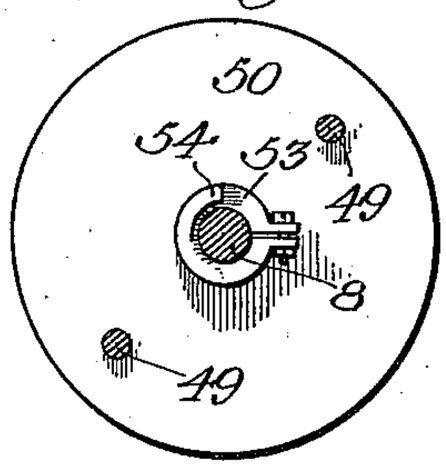


Fig. 7.

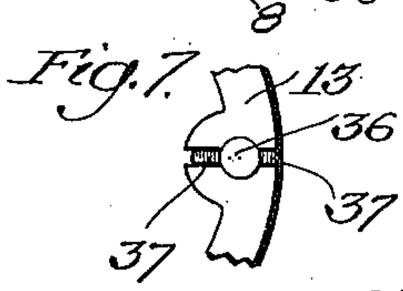


Fig. 5.

Fig. 6.

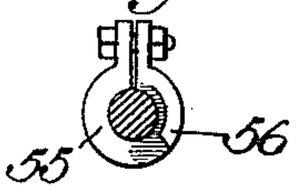
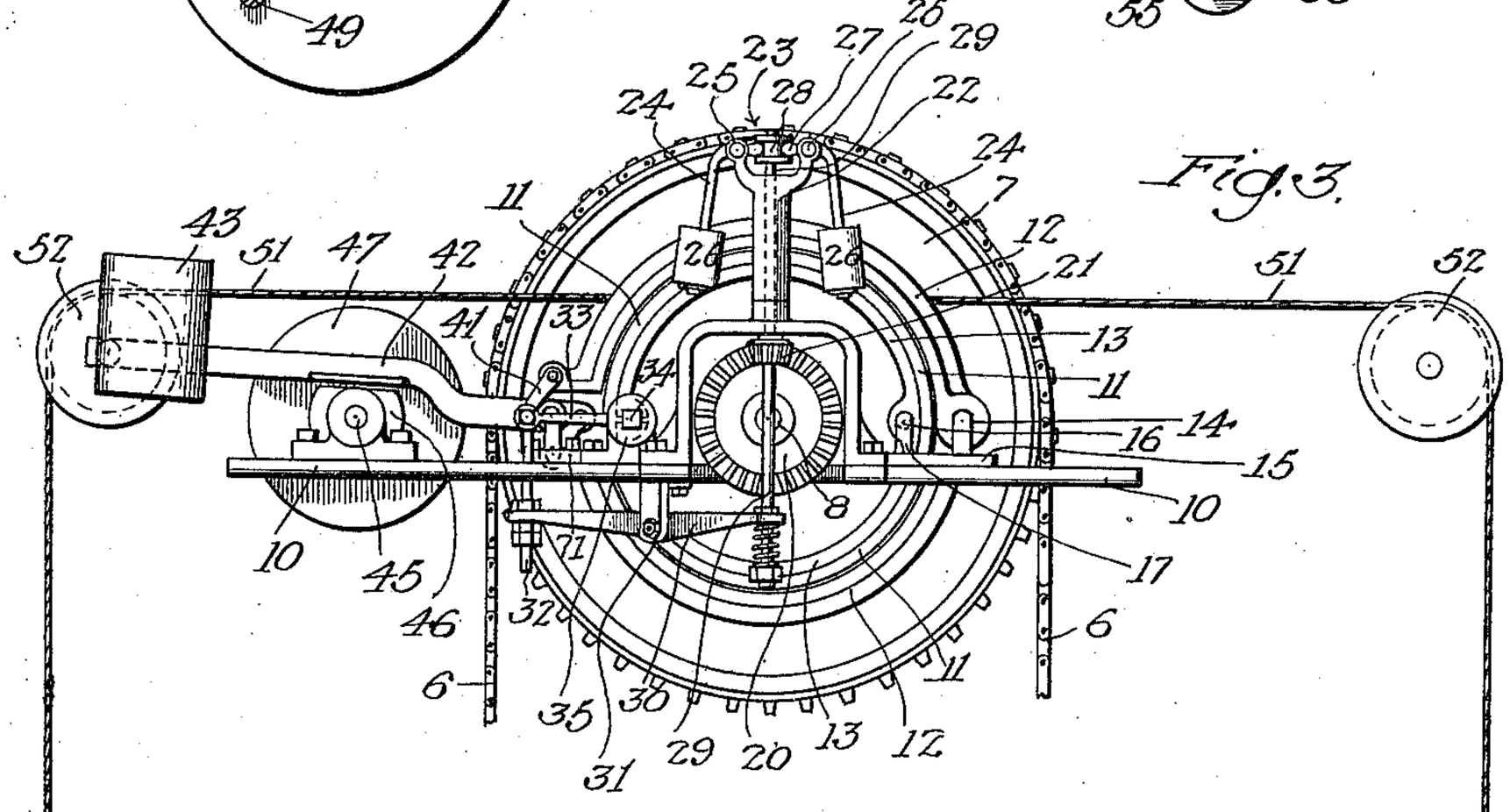


Fig. 3.



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UNITED STATES PATENT OFFICE.

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ELEVATOR MECHANISM.

974,914. Specification of Letters Patent. Patented Nov. 8, 1910.

Application filed September 7, 1909. Serial No. 516,571.

To all whom it may concern:

Be it known that I, JOSEPH W. POGUE, a citizen of the United States, residing at Sierra Madre, in the county of Los Angeles and State of California, have invented new and useful Improvements in Elevator Mechanisms, of which the following is a specification.

This invention relates particularly to a gravity operated elevator and to a controlling mechanism for the same. In the usual arrangement there are two cars or cages arranged in such a manner that the descent of one elevates the other, the descending car carrying a load and the ascending car being empty.

The controlling mechanism comprises a governor operating a brake which prevents the descending car from traveling above a certain predetermined speed; and a mechanism for automatically stopping both cars at the desired point. This stopping mechanism, a brake in this case, is arranged so that it may be manually operated to allow the weighted car to descend or to stop if necessary.

I am aware that both speed control and automatic stopping devices have been used on power elevators; that is, devices which will automatically stop the elevator if it attains a higher speed than is safe or if it runs by its extreme points of travel. My speed governing device differs from these in that it keeps the car running at a certain speed under its own gravitational acceleration; it retards the car an amount depending upon its excessive speed.

In the accompanying drawings, Figure 1 is a side elevation of my improved elevator mechanism. Fig. 2 is a plan view of the same with parts in section. Fig. 3 is a rear side elevation of the same. Fig. 4 is a section taken on line 4—4 of Fig. 2. Fig. 5 is an enlarged view of the stop yoke shown in the lower central portion of Fig. 2. Fig. 6 is a section taken on line 6—6 of Fig. 2. Fig. 7 is a detail view of the expansion means on the inner brake band.

Referring to the drawings 5 designates the two elevator cars each of which is supported on an end of chain 6. This chain passes over a sprocket wheel 7 at its upper end, this sprocket wheel being secured to the shaft 8 mounted in bearings 9 on frame 10. Frame 10 is located at the top of the elevator shafts through which cars 5 move. Mounted on shaft 8 is a brake drum 11 adapted to be acted on by a contracting brake band 12 and an expanding brake band 13. Contraction band 12 is pivoted at 14 to a bracket 15 secured to frame 10. Expanding band 13 is similarly pivoted at 16 to a bracket 17. The inner expanding band is preferably formed in a single piece, its resiliency allowing it to expand and engage with the inner surface of the brake drum. Normally it does not engage with this surface.

On the outer end of shaft 8 as shown in Fig. 3 is mounted a gear 20 which engages with a gear 21 mounted on upright spindle 22 of governor 23. This upright revolving spindle carries a pair of weight arms 24 pivoted to it at 25 and carrying suitable weights 26. These weight arms have inwardly projecting fingers 27 engaging with a grooved collar 28 on a vertically slidable shaft 29. This shaft extends down through spindle 22 and is connected on its lower end with a lever 30 pivoted at 31 to frame 10. The other end of this lever is adjustably connected to a rod 32 which connects with an arm 33 pivoted on a stud 34 mounted in bearing 35 on frame 10. This stud carries an end portion 36 of the configuration shown in Fig. 7 and having two feathers 37 normally lying in the position shown between the ends of interior expansion band 13 which is severed at this point for this purpose. Upon the rotation of stud 34 in either direction the band is expanded to engage with the brake drum and so to stop the rotation of shaft 8.

If an article 40 should be placed in one of the cars 5 having such weight that the car has a tendency to travel faster than desired, weights 26 on the governor will rise under the action of centrifugal force and shaft 29 will be thereby depressed. This will cause the rotation of stud 34 and will cause the brake band to engage with the brake drum, thereby retarding the rotation of shaft 8 until its speed is reduced to the normal.

Outer brake band 12 is constructed in two halves which are hinged together on pivot 14. On the side of the brake drum opposite pivot 14, the ends of the band halves are connected by links 41 to a lever 42. Midway between the points of attachment of the links, lever 42 is pivoted at 70 to a bracket 71 mounted on frame 10. Lever 42 extends outwardly and carries on its end a weight 43, and the arrangement of the lever and

links is such that the weight normally causes band 12 to contract upon the brake drum and to thereby prevent the rotation of shaft 8. Mounted on a shaft 45 beneath lever 42 is a cam 46 of such configuration as to raise the lever to the position shown in dotted lines when the cam is thrown to the dotted position. On the outer end of shaft 45 is a disk 47 which is connected by bar 48 to one of studs 49 mounted on the outer face of tiller sheave 50. This tiller sheave is loosely mounted on shaft 8 and is adapted to be moved manually through the medium of tiller rope 51 which passes over pulleys 52 and hangs down to positions convenient for manual operation.

Just outside of sheave 50 a collar 53 is rigidly clamped around shaft 8, this collar carrying a projecting lug 54 as illustrated. At the outer end of the shaft a similar collar 55 is secured, this collar having a lug 56. Between the collars the shaft is screw threaded as at 57 and a yoke 58 is adapted to be screwed back and forth on the shaft as it rotates. The outer ends of yoke 58 are forked as shown in Fig. 1 and loosely engaged with studs 49, the yoke being thereby held normally from rotation. The yoke carries lugs 59, one on each side for engagement with lugs 54 and 56. When the shaft has rotated an amount determined by the setting of collar 55, one of lugs 59 will come into contact with either of rotating lugs 54 or 56 and the yoke will be thereby rotated, rotating with it the tiller sheave. Through the medium of bar 48, shaft 45 and cam 46 are also rotated and the outer brake is applied to the brake drum. This is the position in which the mechanism is shown.

If an article is placed in the right hand car as at 40 and it is desired to lower it to the bottom of the shaft the tiller rope is pulled downwardly on its left hand end in Fig. 1. This rotates the tiller sheave and disk 47 to the positions indicated in dotted lines, rotating cam 46 so as to lift lever 42 and release brake band 12. The weighted car then starts downwardly, its speed being controlled by the governor mechanism, until it reaches the desired stopping position. At this position of the car lug 54 engages with lug 59 and rotates the tiller sheave and cam 46 back to their normal positions, allowing the brake to be reapplied by weight 43. The car is thus stopped at the position desired.

The mechanism above described is susceptible of many minor detail changes in order to efficiently perform different services. In a long shaft it may be necessary to connect the two cars with a chain which passes downwardly and over a pulley or sprocket located at the bottom of the shafts, in order to overcome any overbalancing which the weight of the extra length of chain on the car at the bottom of the shaft might cause. This and other features of change will be apparent to a mechanic installing the machine and do not enter into the invention proper.

Having described my invention, I claim:—

1. A gravity operated elevator, comprising a shaft, a car connected with the shaft so that the descent of the car causes the rotation of the shaft, a brake drum on the shaft, a contracting brake band and an expanding brake band adapted to work on the drum, a governor mechanism connected with the shaft, connecting means between the governor mechanism and one of the brake bands, a stop mechanism on the shaft, and connecting means between the stop mechanism and the other brake band.

2. A gravity operated elevator, comprising a shaft, a wheel on the shaft, a flexible member passing over the wheel and depending on both sides thereof, a carrier attached to each end of the flexible member, a brake drum on the shaft, a pair of brake bands adapted to engage with the drum, a governor mechanism connected with the shaft, connecting means between the governor mechanism and one of the brake bands whereby the brake band is applied to the drum when the shaft exceeds a certain speed of revolution, a stop mechanism on the shaft, and connecting means between the stop mechanism and the other brake band whereby the brake band is applied to the drum after a certain amount of revolution by the shaft.

3. A gravity operated elevator, comprising a shaft, a wheel on the shaft, a flexible member passing over the wheel and depending on both sides thereof, a carrier connected to each of the depending ends of the flexible member, a brake drum mounted on the shaft, a pair of friction means adapted to be separately and independently applied to the brake drum, a speed governor mechanism connected to the shaft, connective means between the speed governor mechanism and one of the friction means, a stop mechanism connected with the shaft, connective means between the stop mechanism and the other friction means whereby the friction means is operated, and manual means for operating the last named friction means.

4. A gravity operated elevator, comprising a frame, a main shaft journaled in the frame, a wheel on the shaft, a flexible member passing over the wheel and depending from each side thereof, a carrier attached to each of the depending ends of the flexible member, a brake drum mounted on the shaft, a pair of brake bands adapted for engagement with the brake drum, a centrifugal speed governor mechanism connected with the shaft, connective means between the governor mechanism and one of the brake bands whereby the brake band is applied to the

drum when the shaft exceeds a certain predetermined revolution speed, a lever attached to the other brake band, a weight mounted on the lever and adapted to normally apply the brake band to the drum, a cam shaft mounted on the frame, a cam on the shaft located beneath the lever, the cam being of such configuration that a rotation of the shaft causes the cam to engage with and raise the lever to release the brake band from the drum, stop means connected with the main shaft, connecting means between the stop means and the cam shaft whereby the cam shaft is rotated upon a certain predetermined amount of rotation by the main shaft, and manual means to rotate the cam shaft.

5. An elevator mechanism, comprising a shaft, means to rotate the shaft, a brake drum mounted on the shaft, a pair of brake bands engaging with the drum, a speed governor mechanism connected to the shaft to rotate therewith, connective means whereby the governor mechanism operates one of the brake bands, a stop mechanism connected with the shaft, and connective means whereby the other brake band is applied to the drum after a predetermined amount of rotation of the shaft.

6. An elevator mechanism, comprising a shaft, means to rotate the shaft, a brake drum mounted on the shaft, a pair of brake bands engaging with the drum, levers connected to the brake bands and adapted by their movements to engage and disengage the bands on the drum, a speed governor mechanism rotatively connected with the shaft and controlling the movements of one of the brake band levers, a weight mounted on the other lever and adapted to normally keep the connected brake band in engagement with the drum, a cam for raising the lever and releasing the brake band, a stop mechanism connected to the shaft and adapted to operate after a predetermined amount of rotation thereof, and connective means between the stop mechanism and the cam whereby the cam is rotated.

7. A gravity operated elevator, comprising a shaft and a wheel thereon, a flexible suspension member passing over the wheel and depending therefrom on both sides, a carrier attached to each end of the suspension member, a pair of braking mechanisms on the shaft, a stop mechanism connected with the shaft and adapted to operate one of the braking mechanisms after a predetermined amount of rotation of the shaft, and a speed governor mechanism rotatively connected with the shaft and adapted to operate the other braking mechanism when the speed of rotation reaches a predetermined point.

In witness that I claim the foregoing I have hereunto subscribed my name this 1st day of September 1909.

JOE W. POGUE.

Witnesses:
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