No. 824,129. PATENTED JUNE 26, 1906.

V. W. MASON.

ELEVATOR DRIVING MECHANISM.

APPLICATION FILED JUNE 29, 1905.

2 SHEETS—SHEET 1.

Fig. 1.

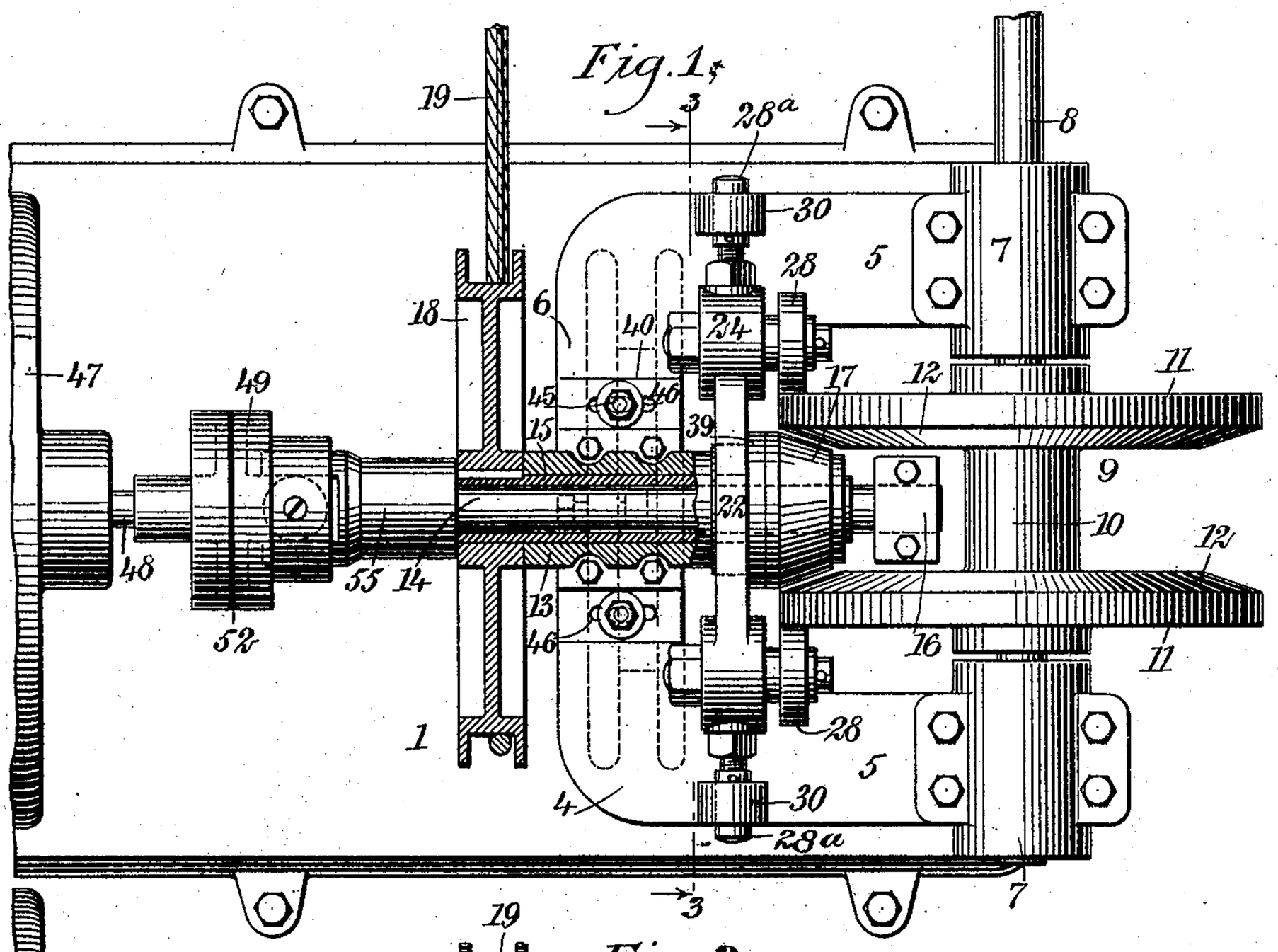
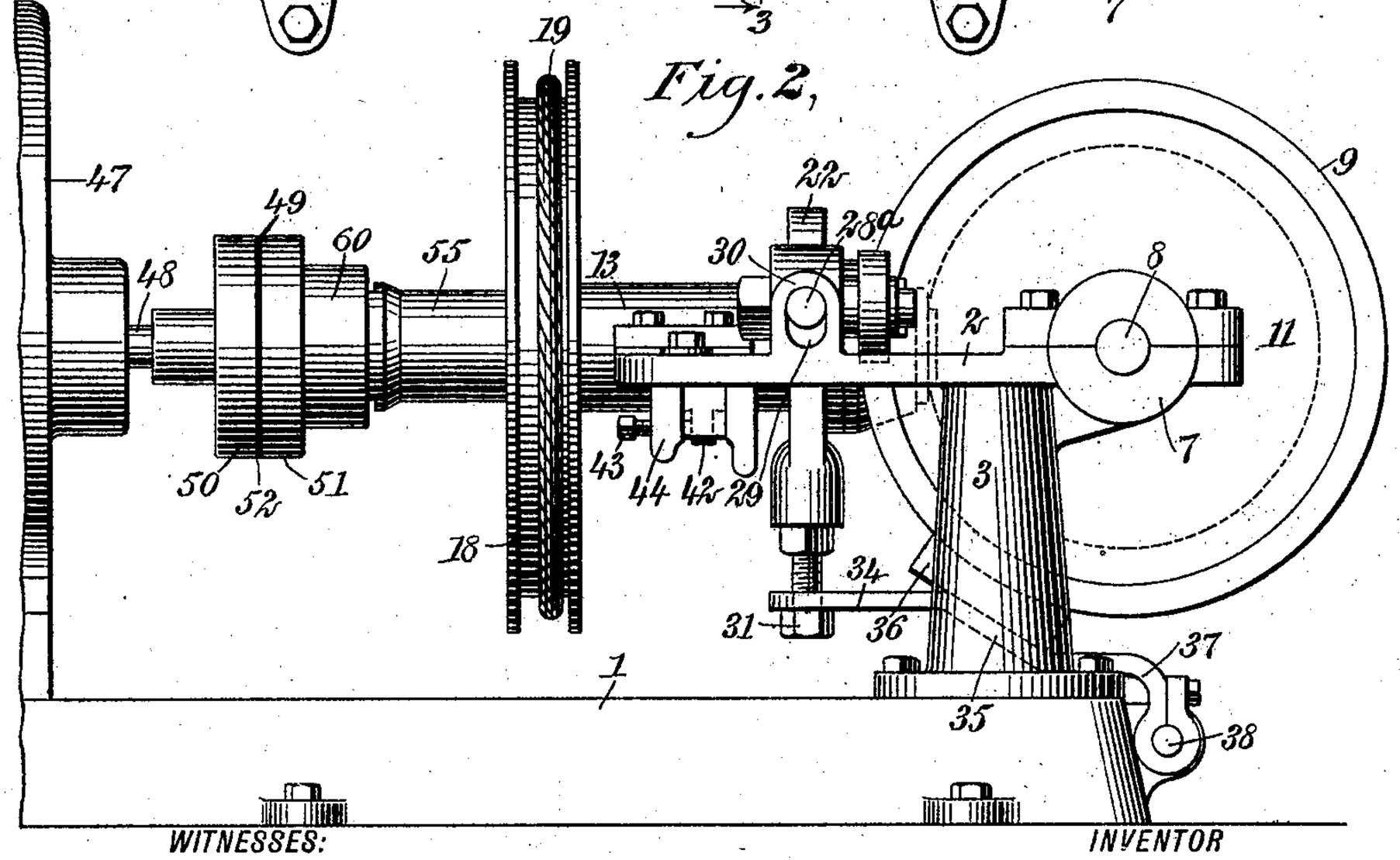


Fig. 2.



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2 SHEETS—SHEET 2.

Fig. 3,

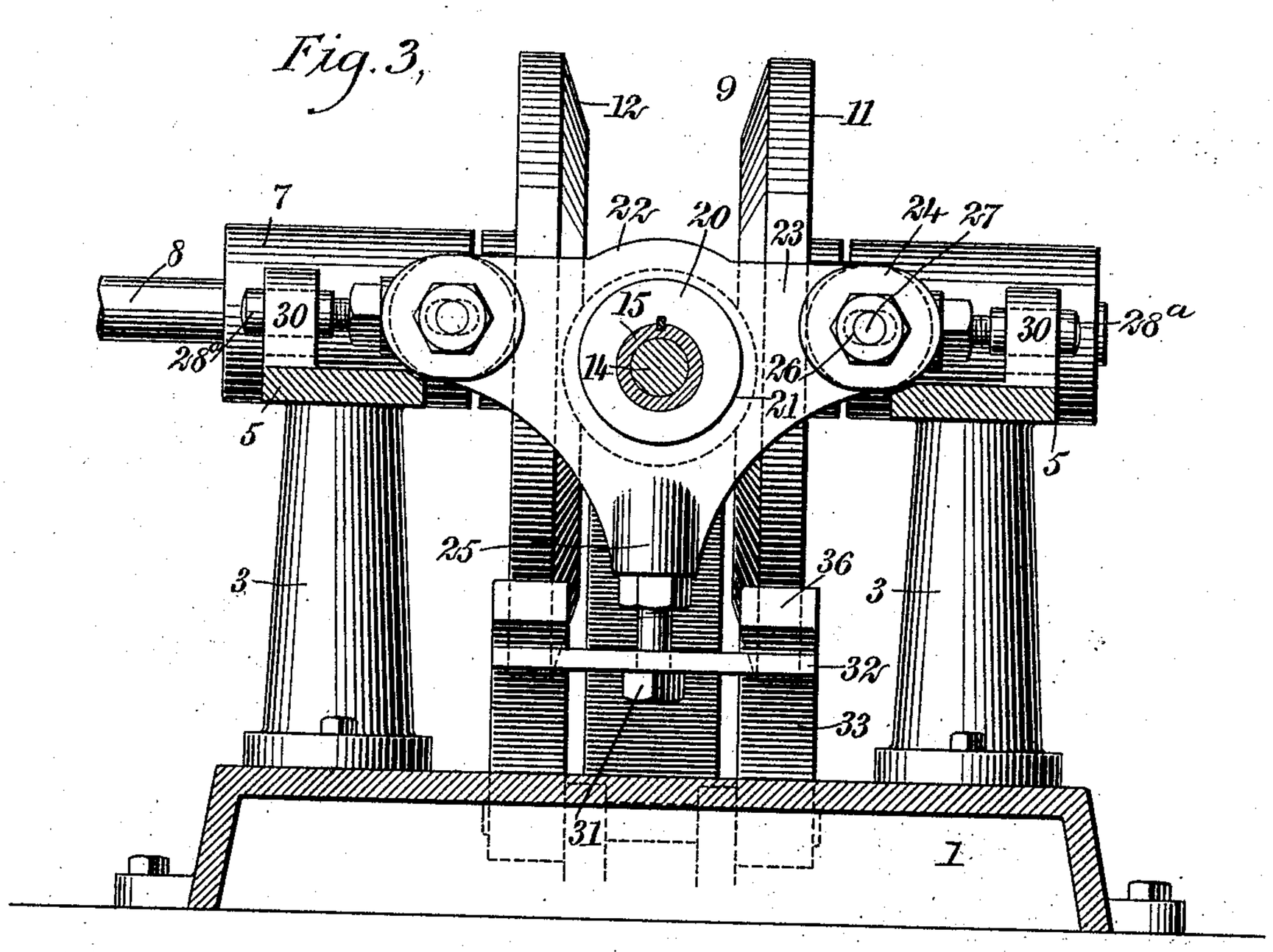


Fig. 4,

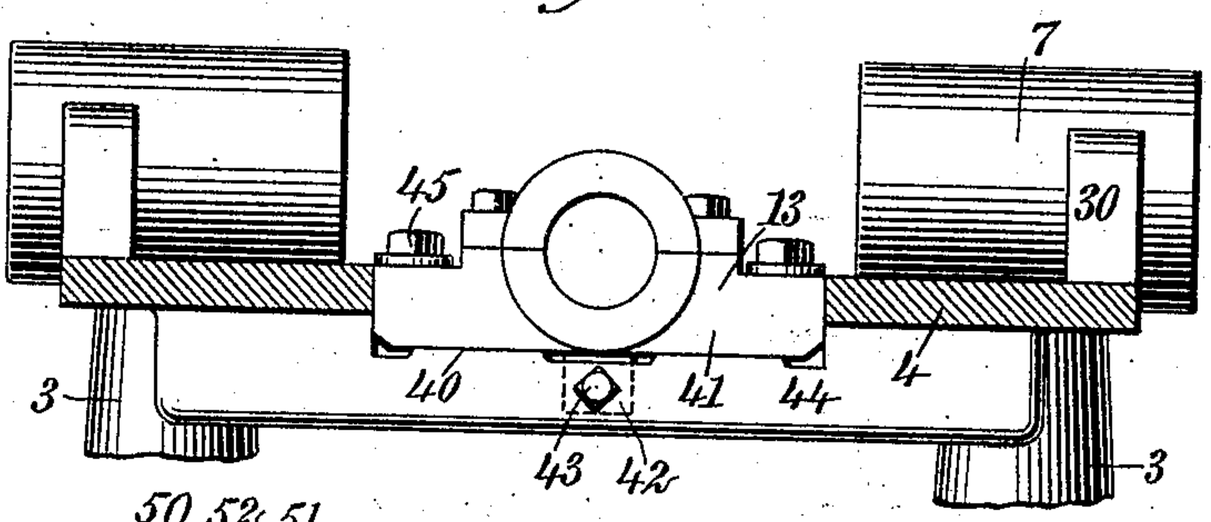


Fig. 5,

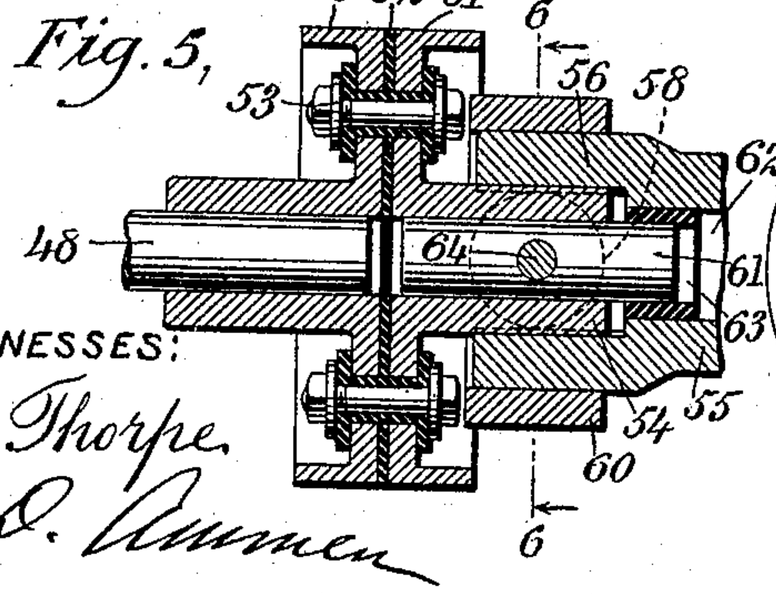
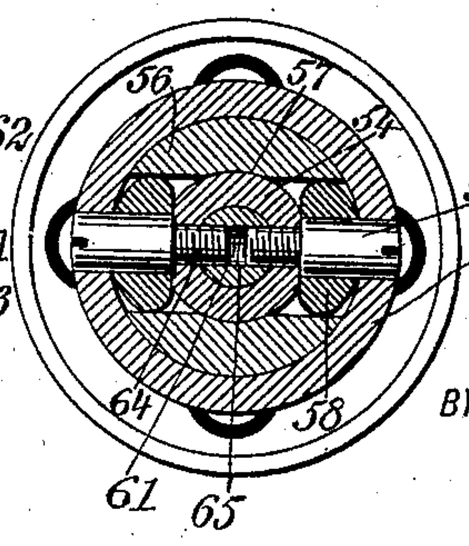


Fig. 6.



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ELEVATOR DRIVING MECHANISM.

No. 824,129. Specification of Letters Patent. Patented June 26, 1906.

Application filed June 29, 1905. Serial No. 267,518.

To all whom it may concern:

Be it known that I, VOLNEY W. MASON, a citizen of the United States, and a resident of Providence, in the county of Providence and State of Rhode Island, have invented a new and Improved Elevator Driving Mechanism, of which the following is a full, clear, and exact description.

This invention relates to elevator driving mechanism, and is especially applicable in mechanism of this class which is driven by an electric motor.

The invention relates especially to the reversing mechanism and concerns itself also with the connection from the motor to this mechanism.

The object of the invention is to provide a reversing mechanism which will operate to apply a brake automatically immediately upon the arresting of the forward motion and prior to the reversal of the motion.

A further object is to improve the connection from the motor to the reversing mechanism, to the end that longitudinal oscillations of the motor-shaft will be provided for.

The invention includes features making for nice adjustments of the parts of the reversing mechanism.

The invention consists in the construction and combination of parts to be more fully described hereinafter and definitely set forth in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a plan of the mechanism, showing a portion thereof in horizontal section and representing a portion of a motor for driving the same. Fig. 2 is a side elevation of the mechanism shown in Fig. 1. Fig. 3 is a cross-section taken substantially on the line 3 3 of Fig. 1. Fig. 4 is a section through the framing of the mechanism and illustrating the manner of mounting a bearing for the driving-shaft. Fig. 5 is a longitudinal section through a coupling for connection from the motor to the reversing mechanism, and Fig. 6 is a cross-section through this coupling, taken on the line 6 6 of Fig. 5.

Referring more particularly to the parts, 1 represents a base or base-plate, upon which is mounted a frame 2, the said frame preferably comprising oppositely-disposed standards or legs 3. These standards 3 support a substantially horizontal yoke 4, said yoke having parallel arms 5, connected by a transverse body 6. Upon the extremities of the arms 5 bearings 7 are formed, on which is rotatably mounted a driven shaft 8. Keyed to this shaft so as to slide thereupon I provide a reversing-wheel 9, the same being disposed between the arms 5, as indicated. This reversing-wheel comprises a hub 10 of reduced diameter, which is formed integral with friction-disks 11, having beveled faces 12 on their adjacent sides.

Upon the body 6 of the yoke 4 a bearing 13 is mounted, in which bearing lies a rotatable driving-shaft 14. This shaft 14 does not lie directly in the bore of the bearing, but is enveloped in a loose sleeve 15, the purpose of which will appear more fully hereinafter. The inner extremity of the shaft 14 is mounted in a suitable bearing 16, disposed between the disks 11, and near this bearing at a suitable point a cone or pinion 17 is carried rigidly by the shaft, as indicated. This cone lies just between the bevel-faces 12 of the friction-disks and is adapted to enter into contact with either of the same by a longitudinal movement of the reversing-wheel, as will be described hereinafter. The mechanism for bringing about this longitudinal shifting of the reversing-wheel will now be described. Upon the outer extremity of the sleeve 15 there is rigidly attached a shipping-pulley 18, about which passes a shipping-cable 19. This cable, it should be understood, passes down through the elevator-shaft and through the car running therein. On the inner extremity of the sleeve 15 there is rigidly attached an eccentric sheave or collar 20, (shown most clearly in Fig. 3,) and this collar is rotatably mounted in an opening 21, formed centrally in a cross-head 22. This cross-head presents rudimentary oppositely-projecting horizontal arms 23, terminating, preferably, in enlarged bosses 24. The cross-head 22 further comprises a downwardly-projecting tail 25, the purpose of which will appear more fully hereinafter. The bosses 24, just referred to, are provided with horizontal openings 26, through which bolts 27 pass, said bolts having projecting extremities carrying rollers 28, as indicated. The faces of these rollers 28 lie against the outer faces of the friction-disks 11. From the extremities of the arms 23 studs 28[a] project laterally, and these studs pass through vertical slots 29, which are formed in ears 30, said ears pro-

jecting upwardly from the upper face of the yoke 4 at opposite sides thereof, as indicated.

From the lower extremity of the tail 25 a bolt 31 projects downwardly, and this bolt supports a cross-bar 32, the extremities of which are formed into brake-arms 33. The said brake-arms have horizontal extensions 34, as indicated in Fig. 2, and inclined extensions 35, to the latter of which brake-shoes 36 attach. These brake-shoes 36 have concave faces which lie adjacent to the circumferential or edge faces of the friction-disks 11. Beyond these inclined extensions 35 the brake-arms 34 are bent downwardly, so as to form necks 37, which attach pivotally to pins 38 on the base 1.

The mode of operation of the reversing mechanism will now be described. By a rotation of the shipping-wheel 18 the eccentric-sheave 20 will be rotated and this will operate to raise or lower the cross-head 22 and move the same to either side. Referring especially to Fig. 3, if the eccentric-sheave were rotated toward the right the cross-head would be moved toward the right and the rollers 28 would operate to move the reversing-wheel 9 also to the right. In this way contact would be made between the pinion 17 and the left-hand friction-disk. Rotation of the driving-shaft 14 would then be transmitted to the driven shaft 8. When the sheave 20 is in its normal or central position, as indicated in Fig. 3, neither of the friction-disks 11 will be in contact with the pinion 17. Furthermore, this position of the eccentric corresponds to the most elevated position of the cross-head. The adjustment of the parts would be such that in moving the eccentric-sheave from one side to the other in order to reverse the mechanism the elevation of the cross-head, which would thus take place before the reversal of the power, would be sufficient to apply the brake-shoes 36 to the faces of the disks 11. For this purpose the bolt 31 would be suitably adjusted and the parts properly proportioned, as will be readily understood. The rising and falling of the cross-head 22 with the eccentric 20 is permitted by the slots 29 in the ears 30. These ears 30 at the same time afford substantial reinforcement for the longitudinal thrust taking place in the driving-shaft 14 by reason of the contact at the driving-pinion. In this connection it should be stated that the pinion 17 is preferably backed by a collar or washer 39, which rests against the adjacent face of the cross-head, as indicated most clearly in Fig. 1. The slots 26 referred to above are provided instead of simple openings in order to enable lateral adjustment of the rollers 28 to be made, so as to adjust nicely the position of the reversing-wheel with respect to the pinion 17.

Referring especially to Fig. 4, the bearing 13 will now be described. In connection with this bearing arrangement is made for adjusting the same nicely in a longitudinal direction, so as to effect an accurate longitudinal adjustment of the pinion 17 with respect to the reversing-wheel. To this end the body 6 of the yoke 4 is cut out, so as to form a guide 40, in which the base 41 of the bearing is slidably mounted. This base 41 is provided with a downwardly-projecting ear 42. Against this ear abuts a set-screw 43, which passes through a bracket 44, formed under the body of the yoke, as indicated. By screwing this set-screw up the base 41 of the bearing may be adjusted in the direction of the reversing-wheel, as will be readily understood. In this connection it should be stated that holding-down bolts 45, which secure the base 41 in position, pass through slots 46, which enables said adjustment to be made.

The connection or coupling from the motor will now be described. A motor 47 is preferably mounted upon the base 1, its shaft 48 extending in the direction of the shaft 14 and being in substantial alinement therewith, as will be readily understood. The shaft 48 is connected to the shaft 14 through oscillation-coupling 49. This coupling is very clearly illustrated in Figs. 5 and 6. The coupling comprises two sections or collars 50 and 51, the former of which is rigidly attached to the extremity of the shaft 48. These sections are insulated from each other by an insulating-disk 52 and rigidly attached together by insulated connecting-bolts 53. The coupling-section 51 is formed with a longitudinally-projecting hub 54. Upon the shaft 14 a coupling-sleeve 55 is rigidly attached, and this sleeve is formed with an enlarged extremity comprising oppositely-disposed forks 56. On their inner adjacent faces these forks are slightly recessed, so as to present concave faces 57, which are received over the hub 54. In the space between the forks 56 rollers 58 are arranged, the same being rigidly attached to the hub 54 by means of pins 59, which pass inwardly, the said pins passing through openings formed in a coupling-ring 60. Within the bore of the hub 54 a centering-pin 61 is provided, which projects into the bore 62 of the aforesaid sleeve 55, being insulated therefrom and centered therein by an insulating sleeve or bushing 63. The aforesaid roller-pins 59 have reduced extremities 64, which are threaded and attached in a threaded opening 65, formed in the sides of the centering-pin 61, as will be readily understood. Thus the rollers 58 are mounted so that their edges may engage the inner faces of the forks 56. With this coupling it should be evident that as the section 51 is driven the rollers 58 will operate to rotate the coupling member 55 by reason of their engagement with the forks 56 thereof. Furthermore, any longitudinal vibration of the shaft 48 will evidently be taken up by the rollers 58, permitting the

member 55 to telescope more or less with the hub 54.

In practice the driven shaft 8 will lead off to a drum, upon which the cables supporting the car are wound.

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

1. In mechanism of the class described in combination, a driving-shaft, a pinion carried thereby, a driven shaft disposed substantially at right angles to said driving-shaft, a reversing-wheel slidably carried by said driven shaft and having disks adapted to engage said pinion, a shipping-pulley rotatably mounted on said driving-shaft and a cross-head actuated by said shipping-pulley and engaging said reversing-wheel, said cross-head affording means for sliding said reversing-wheel to engage said pinion.

2. In mechanism of the class described in combination, a driving-shaft, a pinion carried thereby, a driven shaft disposed substantially at right angles to said driving-shaft, a reversing-wheel slidably mounted on said driven shaft and having disks which may engage said pinion, a shipping-wheel rotatably mounted on said driving-shaft, a cross-head having a fixed pivotal support, an eccentric actuated by said shipping-wheel and controlling said cross-head, means carried by said cross-head for engaging said reversing-wheel, and a brake-shoe carried by said cross-head which may engage said reversing-wheel.

3. In mechanism of the class described in combination, a driving-shaft, a pinion carried thereby, a driven shaft disposed substantially at right angles to said driving-shaft, a reversing-wheel slidably mounted upon said driven shaft and having disks adapted to engage opposite sides of said pinion, a cross-head engaging said reversing-wheel to shift the same longitudinally to or from said pinion, and a brake carried by said cross-head and adapted to engage said reversing-wheel.

4. In mechanism of the class described, in combination, a driven shaft, a reversing-wheel slidably mounted thereupon and adapted to drive the same, said reversing-wheel having a pair of disks, a pinion located therebetween and adapted to drive said disks in either direction, a cross-head, means carried thereby for engaging said disk, an eccentric adapted to move said cross-head, and a brake carried by said cross-head and which may engage said wheel.

5. In mechanism of the class described, in combination, a driven shaft, a reversing-wheel slidably carried thereby and comprising a pair of disks, a pinion mounted between said disks and adapted to drive either of the same, a cross-head, rollers carried thereby engaging the faces of said disks, an eccentric-sheave carrying said cross-head, means for rotatably mounting said sheave, and a brake attached to said cross-head and having shoes adjacent to the faces of said disks.

6. In mechanism of the class described, in combination, a shipping-pulley, a sleeve rigid therewith, a driving-shaft passing loosely through said sleeve, a pinion carried by said driving-shaft, a driven shaft, a reversing-wheel slidably mounted on said driven shaft and having disks which may engage said pinion, an eccentric carried on said sleeve, a cross-head actuated by said eccentric and having means for engaging said reversing-wheel, and a brake attached to said cross-head and lying adjacent to the face of said reversing-wheel.

7. In mechanism of the class described, in combination, a frame, a driven shaft rotatably mounted therein, a reversing-wheel slidably mounted on said shaft and having disks, a cross-head, a shaft passing through said cross-head, a pinion carried thereby and adapted to drive either of said disks, means for guiding said head upon said frame, a sleeve carrying an eccentric rotatably mounted in said cross-head, and a brake actuated by the said cross-head and adapted to engage said reversing-wheel.

8. In mechanism of the class described, in combination, a frame, a reversing-wheel mounted thereon a pinion coöperating therewith to drive the same in either direction, a cross-head affording means for reversing the movement, and a brake pivotally mounted on said frame and attached to said cross-head, said brake having shoes adapted to engage said reversing-wheel.

9. In mechanism of the class described in combination, a frame, a driven shaft rotatably mounted thereon, a driving-shaft, a pinion carried thereby, a reversing-wheel slidably mounted on said driven shaft and having disks adapted to engage said pinion, an eccentric rotatably mounted, a cross-head controlled by said eccentric, pivoted to said frame and engaging said reversing-wheel, means for guiding said cross-head on said frame, and a shoe carried by said cross-head adapted to touch said reversing-wheel.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

VOLNEY W. MASON.

Witnesses:

ARTHUR J. CUTHBERT,

ARCHIE B. CLARK.