

(No Model.)

2 Sheets—Sheet 1.

F. E. HERDMAN.
ELEVATOR.

No. 506,911.

Patented Oct. 17, 1893.

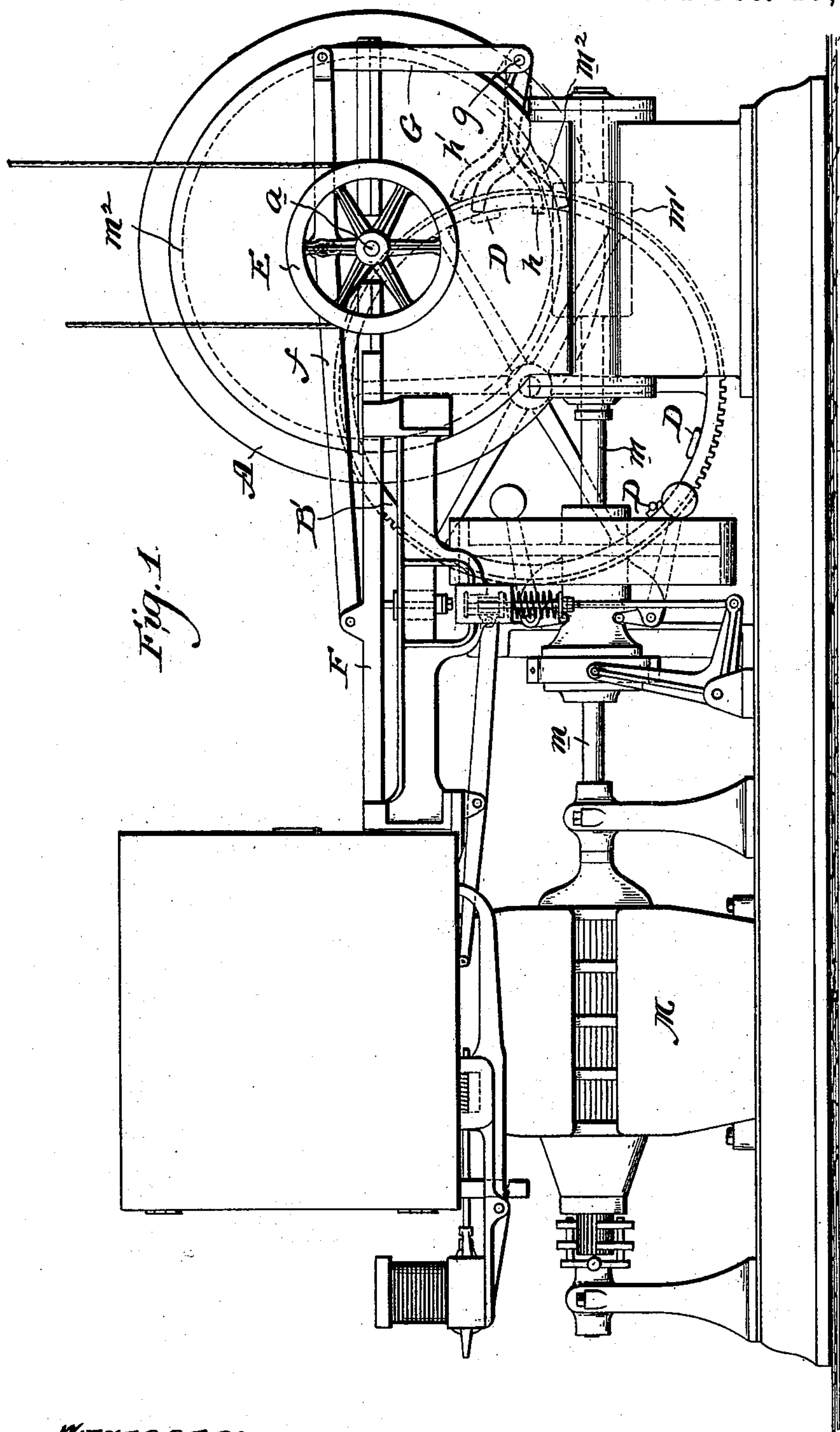


Fig. 1.

WITNESSES:

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INVENTOR:

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*By his atty
R. H. Harding*

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2 Sheets—Sheet 2.

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Fig. 2.

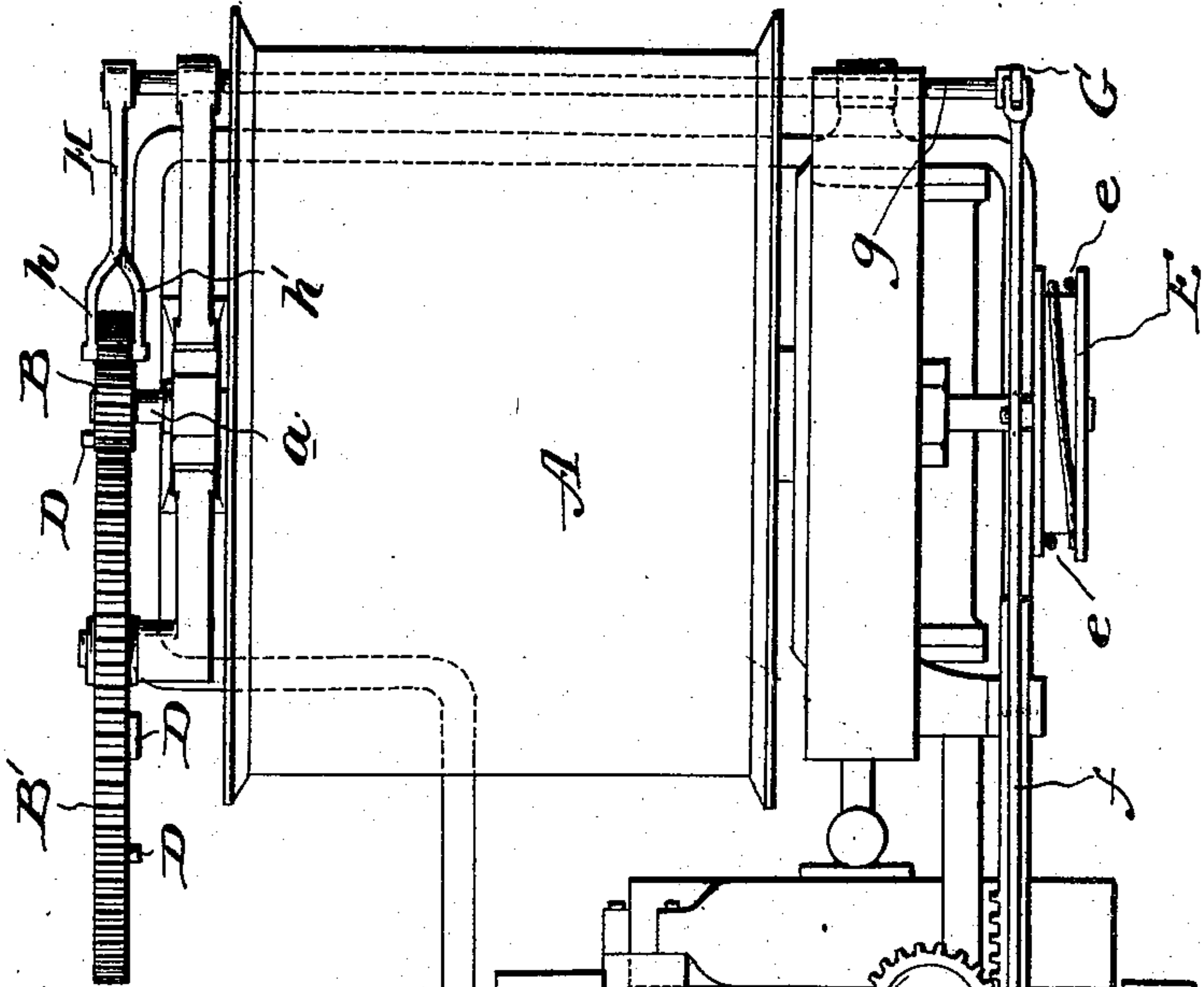


Fig. 4.

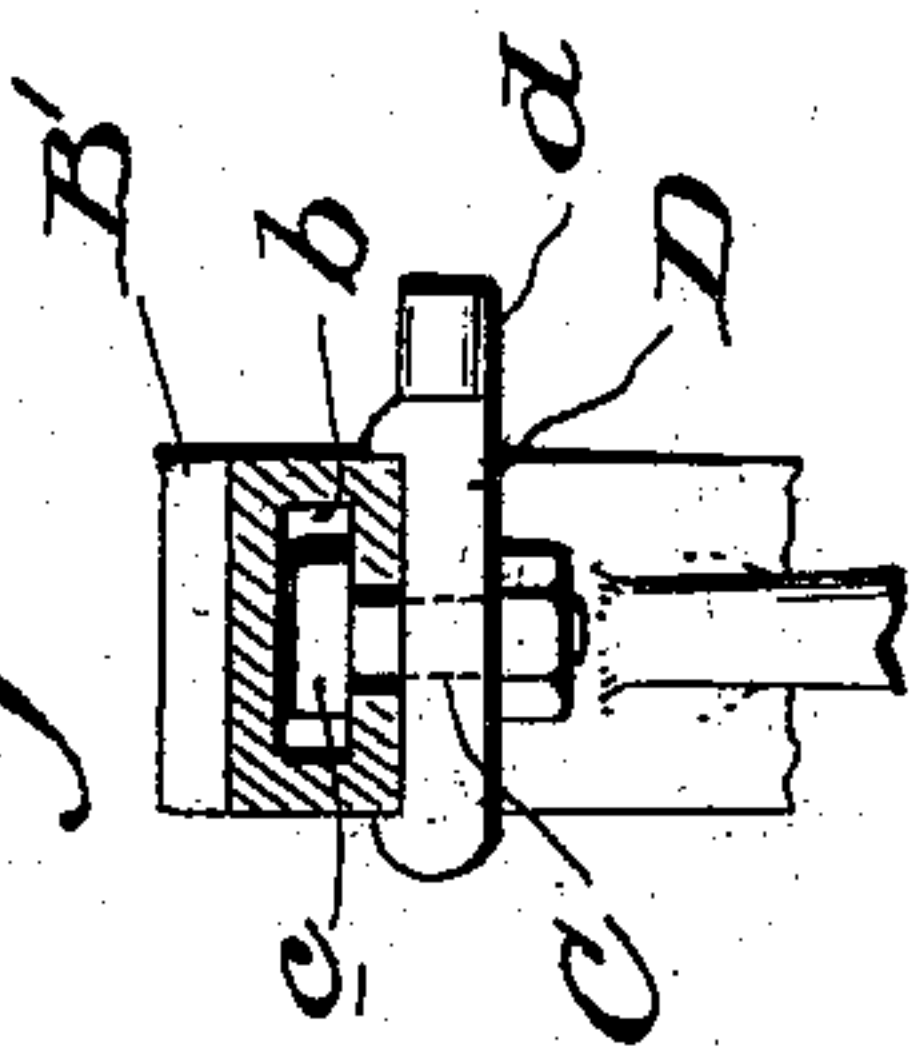
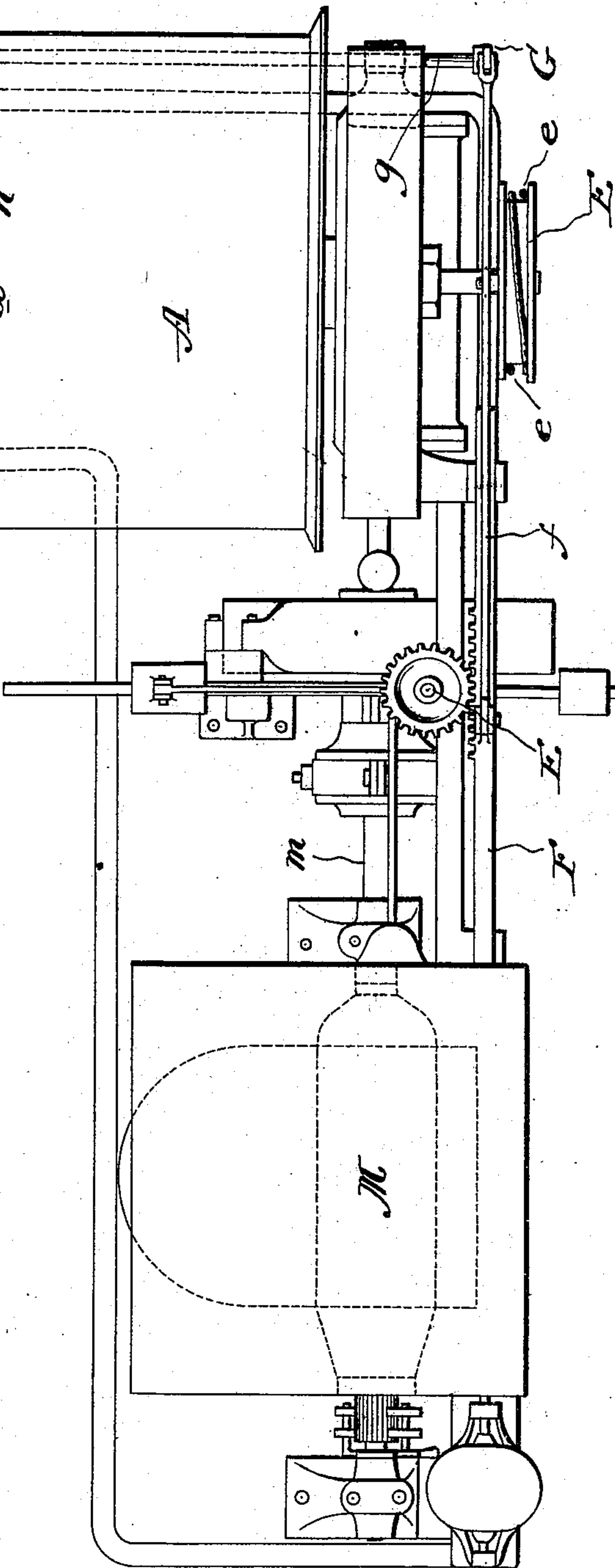
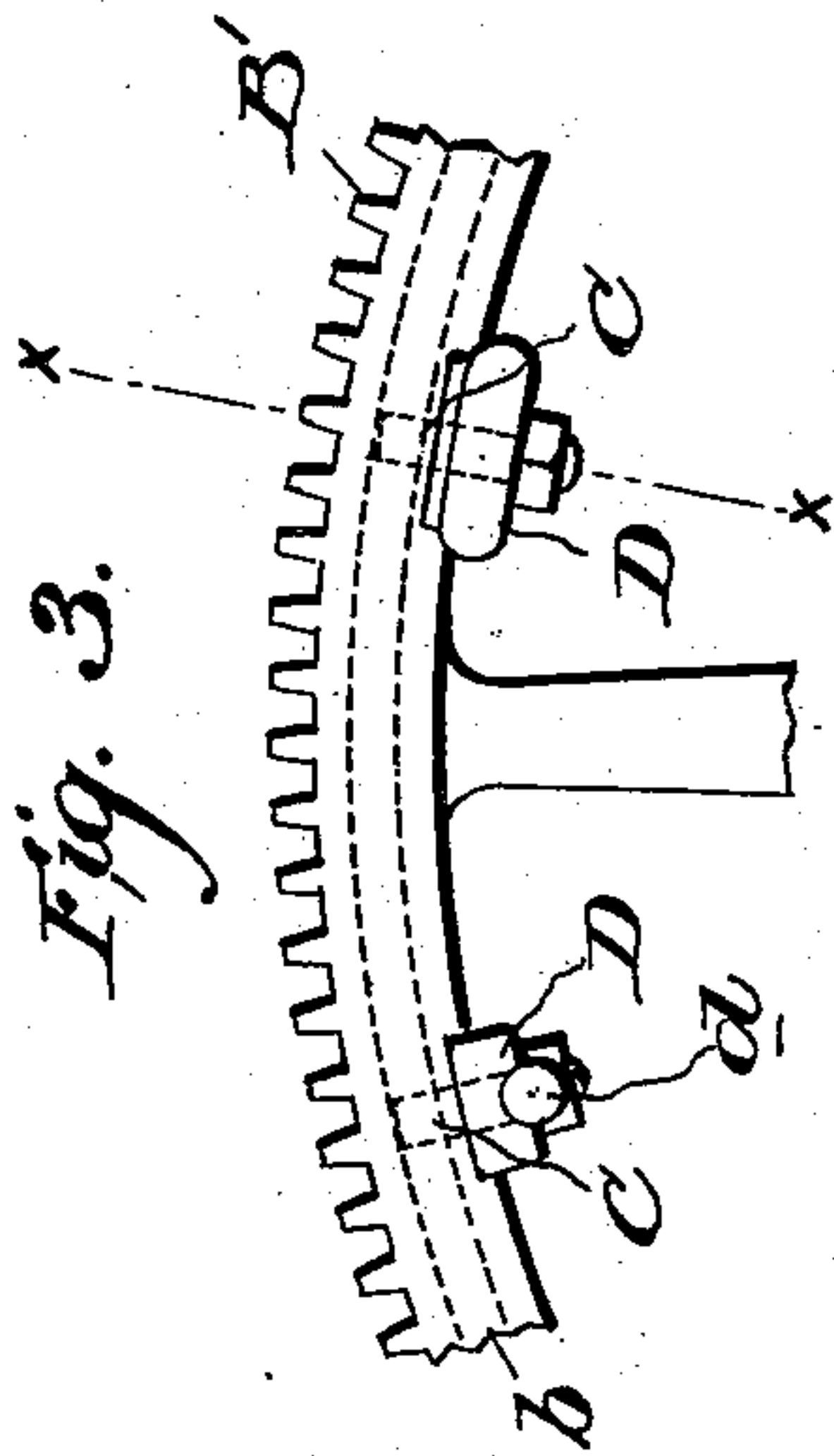


Fig. 3.



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UNITED STATES PATENT OFFICE.

FRANK E. HERDMAN, OF INDIANAPOLIS, INDIANA.

ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 506,911, dated October 17, 1893.

Application filed October 20, 1892. Serial No. 449,524. (No model.)

To all whom it may concern:

Be it known that I, FRANK E. HERDMAN, a citizen of the United States, residing at Indianapolis, county of Marion, and State of Indiana, have invented a new and useful Improvement in Elevators, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which form a part of this specification.

My invention has for its object certain improved mechanism for automatically stopping the elevator at any desired point, and is adapted for use with any elevator using lifting cables and a drum upon which said cables are wound and from which they are wound.

I will describe my improvement in use with an elevator the power for operating which is an electric motor; but, as will readily be seen, after my improvement has been fully described, it can be used with an elevator the power for operating which is hydraulic or steam.

In the drawings: Figure 1 is a side elevation of elevating mechanism. Fig. 2 is a plan view of same. Fig. 3 is an enlarged side elevation of a portion of the gear wheel B', and Fig. 4 is a section on the line *x-x*, Fig. 3.

M is the motor, the shaft *m* of which operates the worm *m'*, which gears with the worm wheel *m²* on the drum shaft *a*. Upon this shaft *a* is the winding or cable drum A. To the end of the drum shaft *a* is secured a pinion B, in which meshes the gear B'. These two gears B and B' are constructed so as to be in a certain relation to each other; that is, in the full travel of the elevator car the gear B' makes but one revolution, or less than one revolution, or not enough over one revolution to allow the same pin D to come in contact with the lever H more than once during the full travel of the car, as will hereinafter be fully described. Instead of reducing the revolutions of the gears directly from the gear B to the gear B', compound gears may be used and still gear B' have but one revolution in the full travel of the elevator. The inner edge of the rim of the gear wheel B' is provided with a slot *b* extending around the entire circumference (see Fig. 3).

C is a bolt, the head *c* of which is adapted to be inserted in said slot, the bolt itself pass-

ing through a forging D having a pin *d* in its outer end. The pin *d* can be located at any desired point on the circumference of the gear B', and any number of these pins can be located on the circumference of the gear B'.

E is the operating sheave mounted loosely on the drum shaft and connected with the car by any desired means.

In the drawings, E is the operating sheave carrying the cables *e*, which extend through the car.

F is the operating bar, which is connected with the source of power, said bar F being connected to the operating sheave by link *f*. To the end of this link is connected the lever G attached to shaft *g*. To the opposite end of this shaft is secured a forked lever H, which is in such position (see Fig. 2) that one prong *h* passes on one side of the gear B' and the other prong *h'* on the other side of the gear B'.

The operation is as follows: Take, for instance, when the elevator is descending and the operating bar moved to the right, the lever being in the upper of the two positions shown in dotted lines Fig. 1, the prong *h* on the lever H being raised so as to be in line with the center of gear B'. A forging D with pin *d* is placed on the gear B' in such position that it will strike the prong *h* when the elevator has descended the desired distance. When the pin *d* strikes the prong *h*, it lowers said prong and lever H to the lower of the two positions indicated in Fig. 1, which rocks the shaft *g*, moving the lever G and through it the bar F to the left, stopping the mechanism. The prong *h* and pin *d* are so adjusted that when the pin *d* has pushed the prong *h* downward so as to move the bar F a distance sufficient to shut off the power, said pin is in a position to pass beyond said prong, thereby preventing the movement of the bar so as to reverse the movement of the elevator. To ascend, the operating bar is thrown to the left and the forked lever depressed so that when the gear B' has revolved the desired distance a pin *d* placed on its circumference will strike the upper prong and move it up to the lower of the two positions indicated and thus bring the operating bar to the center and stop the mechanism. These pins *d* can be placed at any desired points on the gear B', so that the elevator can be stopped

automatically at various points in its ascent and descent; and when the pin *d* has passed beyond the prong *h* or *h'*, when the elevator is stopped, the operator is free to operate again until it strikes the next pin.

The pins placed on the gear *B'* to stop the elevator at the end of its travel up and down are made of length sufficient to lock the prong in that direction, so that when the bar *F* is thrown to the center it cannot be moved back in the direction it was moved, but the bar *F* can be operated in the opposite direction to reverse the elevator. Thus the elevator is automatically stopped at intermediate points and automatically stopped and locked at the ends of its travel.

Having now fully described my invention, what I claim, and desire to protect by Letters Patent, is—

1. In an elevating apparatus, in combination, a lifting cable drum, a gear wheel, connection between said gear wheel and the drum adapted to revolve said gear wheel, stops at fixed points on the circumference of said gear, power controlling mechanism, and intermediate connection with the power controlling mechanism and adapted to be engaged by said stops.

2. In an elevating apparatus, in combination, a lifting cable drum, a gear wheel, connection between said gear wheel and the drum, adapted to revolve said gear wheel, said gear wheel being provided with a slot, stops adapted to be secured in said slot, power controlling mechanism, and intermediate connection with the power controlling mechanism and adapted to be engaged by said stops.

3. In an elevating apparatus, in combination, a lifting cable drum, a gear wheel, connection between said gear wheel and the drum, adapted to revolve said gear wheel, stops on said gear, an operating bar, a shaft, connection between the operating bar and said shaft, and a lever secured to said shaft and provided with a forked end, one fork resting on each side of said gear and adapted to be engaged by stops on said gear.

4. In an elevating apparatus, in combination, a lifting cable drum, a gear wheel, connection between said gear wheel and the drum, adapted to revolve said gear wheel, said gear wheel being provided with a slot, stops adapted to be secured in said slot, an operating bar, a shaft, a lever on said shaft, connection

between the operating bar and said lever, and a lever secured to said shaft and provided with a forked end, one fork resting on each side of said gear and adapted to be engaged by the stops on said gear.

5. In an elevating apparatus, in combination, a lifting cable drum, a gear wheel on the shaft of said drum, a secondary gear adapted to be revolved by the drum shaft gear, stops on said secondary gear, power controlling mechanism, and connection with the power controlling mechanism and adapted to be engaged by said stops.

6. In an elevating apparatus, in combination, a lifting cable drum, a gear wheel on the shaft of said drum, a secondary gear adapted to be revolved by the drum shaft gear, said secondary gear wheel being provided with a slot, stops adapted to be secured in said slot, power controlling mechanism, and intermediate connection with the power controlling mechanism and adapted to be engaged by said stops.

7. In an elevating apparatus, in combination, a lifting cable drum, a gear wheel on the shaft of said drum, a gear and connection between the gear wheel on the drum shaft and said gear, adapted to revolve said gear, an operating bar, a shaft, a lever on said shaft, connection between the operating bar and said lever, and a lever secured to said shaft and provided with a forked end, one fork resting on each side of said gear and adapted to be moved to operate the power controlling mechanism at certain points in the revolution of said gear.

8. In an elevating apparatus, in combination, a lifting cable drum, a gear wheel on the shaft of said drum, a secondary gear adapted to be revolved by the drum shaft gear, said secondary gear wheel being provided with a slot, stops adapted to be secured in said slot, an operating bar, a shaft, a lever on said shaft, connection between the operating bar and said lever, and a lever secured to said shaft and provided with a forked end, one fork resting on each side of said gear and adapted to be moved in line with said gear.

In testimony of which invention I have hereunto set my hand.

FRANK E. HERDMAN.

Witnesses:

W. V. MARTIN,
JOSEPH COOK.