(No Model.)

C. R. PRATT.

CLUTCH APPLIANCE FOR ELEVATORS.

No. 417,086. Patented Dec. 10, 1889.

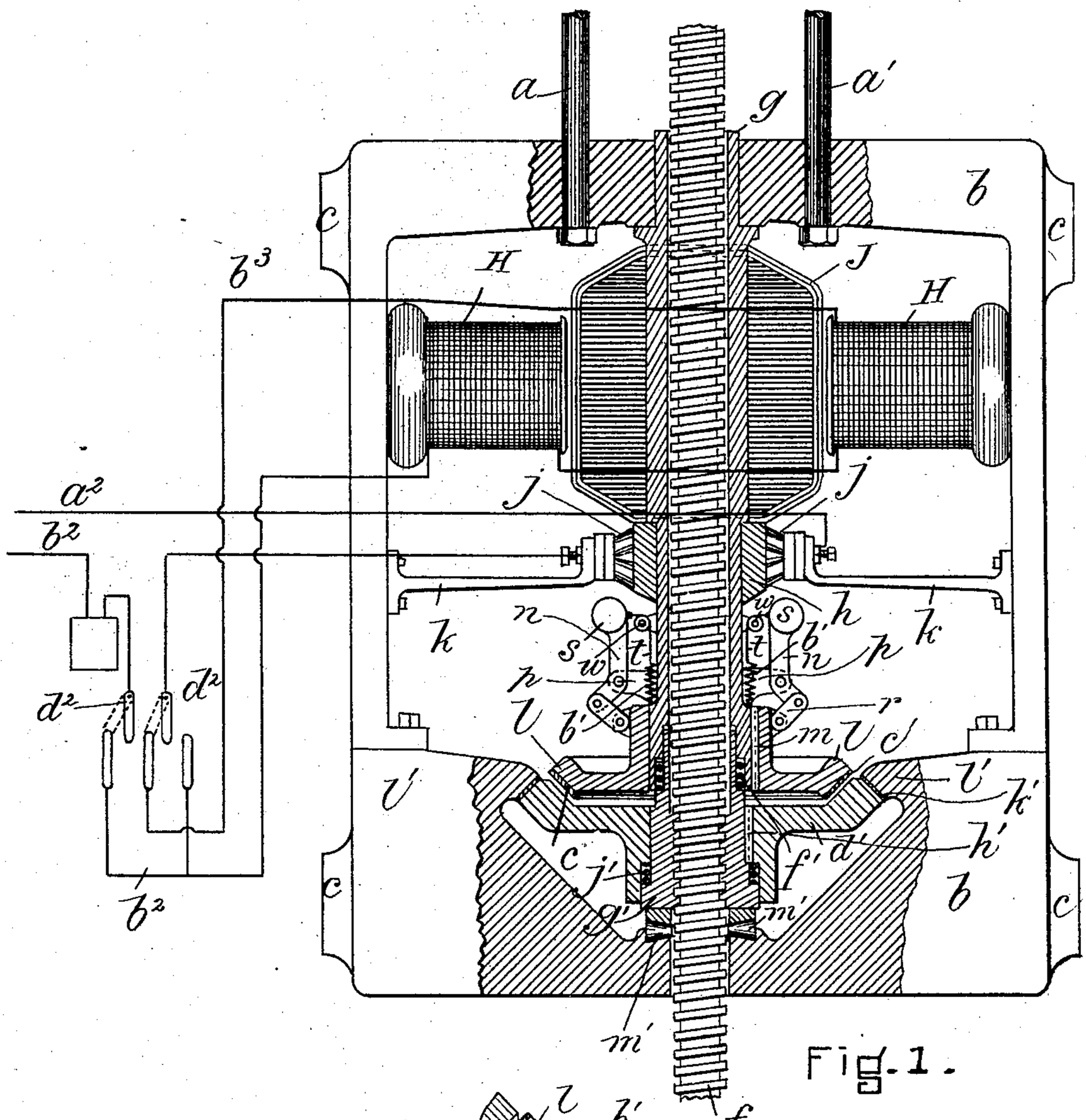

Fig. 1.

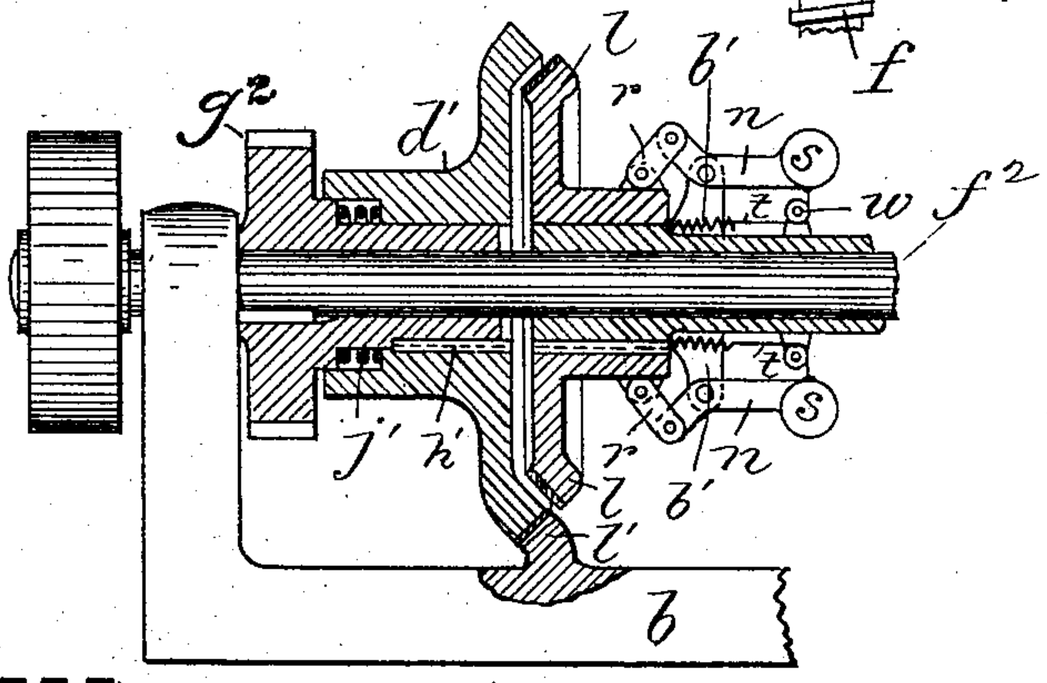

Fig. 2.

WITNESSES

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CLUTCH APPLIANCE FOR ELEVATORS.

SPECIFICATION forming part of Letters Patent No. 417,086, dated December 10, 1889.

Application filed December 31, 1888. Serial No. 295,031. (No model.)

To all whom it may concern:

Be it known that I, CHARLES R. PRATT, of Boston, county of Suffolk, State of Massachusetts, have invented certain new and useful Improvements in Appliances for Elevators, &c., of which the following is a specification, reference being had to the drawings accompanying and forming a part hereof, in which—

Figure 1 is a vertical section showing my devices for applying motive power to an elevator. Fig. 2 is a view, partly in section, showing a modification.

I have shown my invention as applied to an elevator, since that is the device to which it has been applied and for which it was originally designed, although, as will be obvious, it may be applied to other devices.

The object of my invention is the construction of an improved device or appliance by which an electromotor may be used and applied as a motive power for operating a machine; and it consists, chiefly, of the mechanical devices shown and hereinafter described, by which an electromotor of common construction may be made to revolve a nut, thus causing it to travel on a threaded shaft, or, if the nut and shaft be fast to each other, may cause the shaft to revolve; and my invention further consists in the arrangement and application of the peculiar form of clutch mechanism hereinafter described, by which a driving and driven as also a stationary part may be engaged or disengaged, all as will be hereinafter more fully described.

The device and its application will be readily understood from the following description and the accompanying drawings.

a a are connecting-rods such as are commonly employed in hydraulic elevators to connect the piston with the traveling sheave under which the hoisting-rope passes. These rods *a a* are secured at their lower ends to a traveler or case *b*, which is provided with gibs *c*, arranged to slide in grooves in uprights, which are not shown, but which may be of common construction and placed vertically beside the elevator-hoistway if the uprights be used in a vertical position. In case the apparatus is to be placed horizontally the guides in which the gibs *c* travel may be placed beneath the hoistway or in the basement of the building. As will be clear, if the traveler *b* is caused to travel between the uprights the elevator-car may be lowered or raised. For convenience I will describe the device as arranged to move vertically between guides located at one side of the elevator-hoistway.

The mechanism which causes the movement of the traveler *b* is as follows: Between the guides which receive the gibs *c*, I place a threaded rod or screw *f*, which is firmly secured at one or both ends. The rod *f* projects through the traveler or case *b*, as shown, an aperture being made in the case to receive it. Inside the traveler *b*, I arrange an electromotor as follows: The magnets and their coils (shown at H) are secured by suitable means to the inside of the traveler *b*. The armature (shown at J) is secured to a driving-shaft *g*, which in the device shown is a hollow shaft or sleeve, this form being used chiefly for greater compactness of construction, through which the threaded rod *f* passes and the upper end of which is journaled, as shown, in the frame *b*. Below the armature J the commutator *k* is also mounted on the shaft *g*, and the commutator-brushes *j*, which may be of any well-known construction, are supported on arms which are fast on the traveler *b*. On the lower end of the driving-shaft *g* is secured an annular clutch member *l* by means of a spline, (indicated at *m*,) which permits of the movement of the clutch member lengthwise only of the shaft *g*. Two levers *n*, one on either side of the shaft *g*, are pivoted, as shown, to projections *p* on said shaft. The lower ends of the levers *n* are bent downwardly to form one member of the toggle device, the other member of the toggle being a short link *r*, which is pivoted at one end to the lower end of the lever *n* and at the other to a projection on the upper end of the clutch member *l*. The upper end of the lever *n* is provided with a centrifugal weight, (shown at *s*.) A cord *t* is secured behind the weight *s* and passes over a sheave or eye *w* on the shaft *g*, thence to a spring *b'*, which is secured to said shaft, as shown. It will be clear that if the shaft *g* is rapidly revolved centrifugal force will throw the weights *s* away from the shaft, straightening the toggles at the lower ends of the lever *n* and carrying down the clutch member *l*, forcing its

friction-surface (shown at *c*) into contact with the corresponding surface on the clutch member *d'*. If the shaft *g* be stopped, the spring *b'* will act to raise the weights *s* to the position shown, Fig. 1, and thus to allow the clutch member *l* to rise clear of the clutch member *d'*. The member *l* is raised by the action of the spiral spring *f'*, which is placed between a shoulder on said member and another shoulder on the nut *g'*, as shown, and which is compressed when said clutch member *l* is forced into contact with the member *d'*. The member *d'* is secured to the nut *g'* by means of a spline, (shown at *h'*,) so that the nut and clutch member will revolve together; but the clutch member may have a movement lengthwise of the nut. The nut *g'* is threaded and is adapted to be screwed up or down the threaded shaft *f*. A spiral spring *j'* encircles the nut *g'* between a shoulder on the nut and a shoulder on the clutch member *d'*, as shown, and this spring acts to force the said member *d'* upwardly and to force its friction-face *k'* into contact with the corresponding face on the stationary clutch member *l'* on the traveler *b*, so that when the nut *g'* is at rest it will be locked to the said traveler *b* by means of the friction-clutch *d' l'*. The lower end of the nut *g'* bears against the traveler-case *b* and pushes the case *b* downwardly, thus raising the elevator when the nut is traveling down the shaft. It is therefore desirable that between the lower edge of the nut and the traveler *b* friction should be prevented as much as possible, and to this end I have shown at *m'* conical antifriction rolls between the nut and the traveler. In place of the conical rolls *m'* any antifriction device may be employed.

As will be obvious, the precise form of motor employed is not important, as motors of various forms now in use may be used. Neither is the precise manner of connecting the wires for supplying the current of special importance, as the connections may be made in varions ways; but I have indicated by conventional lines one method of wiring the motor, and I will briefly describe it.

The current may pass into the machine through the wire marked b^2, thence to the switch, (shown at d^2,) this switch, if the device is applied to an elevator, being located in the elevator-car. If the switch d^2 is in the position indicated in dotted lines, Fig. 1, the current will pass along the wire b^2, will traverse the magnetic coils, thence back along the wire marked b^3, and through the other member of the switch d^2 to the commutator, thence through the armature, and out along the wire marked a^2. It will be clear that by shifting the switch d^2 in the opposite direction from that shown in dotted lines the motor will be reversed. It will be seen that if the switch d^2 is located in an elevator-car the person in charge of the elevator can control the motor and that the motor will be at rest when the elevator is at rest, and consequently that only so much current as is necessary to operate the elevator will be used.

The operation of the device is as follows: Current being supplied, the armature J is caused to revolve, carrying with it the shaft *g*. The rotary movement of the shaft throws out the centrifugal weights *s* and forces the clutch member *l* downwardly against the member *d'* on the nut *g'*. The downward pressure of the member *l* forces downward the member *d'* and clears it from the stationary member *l'*, and the members *l* and *d'* revolve together, thus revolving the nut *g'*. If this revolution be toward the right, the nut *g'* will travel down the rod *f* and will carry down the traveler *b* and the rods *a a*, thus causing the elevator-car to ascend. When the elevator has reached the point at which it is to be stopped, the switch d^2 is shifted, cutting off the current and causing the shaft *g* to slacken its speed, the centrifugal weights *s* are raised by their springs, and the spring *f'* forces up the clutch member *l*, clearing it from the member *d'* and allowing the said member *d'* to come in contact with the stationary member *l*, thus locking the nut *g'* and traveler *b* and securing them at one point on the threaded rod *f*. If the current be reversed, the clutch member *d'* will be freed from the traveler *b* in the same manner as already described, and the elevator-car will be allowed to descend.

In place of the threaded shaft *f* a plain shaft f^2 may be employed, the nut g^2 being fast thereto, as shown, Fig. 2, and without changing the mechanism essentially the motor may be made to revolve the shaft, and thus power may be supplied to operate an elevator or other machine. This form of the device might be rendered necessary for elevators in cases where the wells or hoistways would not permit of a construction such as is shown in Fig 1.

What I claim is—

1. The combination of the actuating-shaft with a clutch comprising a driving member operatively connected with said shaft, a driven member co-operating therewith, and a stationary member co-operating with said driven member to hold the same when disengaged with the driving member, and centrifugal weights and toggle-levers constituting shipper mechanism for said clutch, substantially as shown and described.

2. The combination, with the nut *g'* and its clutch member *d'*, of the rod *f*, the shaft *g*, the clutch member *l*, and its weight and toggle mechanism, substantially as shown and described.

3. The combination, with the traveler *b*, having a clutch member *l'* fast thereto, of the nut *g'* and its clutch member *d'* and the rod *f*, substantially as shown and described.

4. The combination, with the shaft *g* and the armature, of the clutch member *l*, the

weighted lever n and link r, the clutch members d' l', and the shaft f, substantially as shown and described.

5. The combination, with the threaded rod f and case b and the clutch member l', of the nut g' on said rod, the clutch member d', connected with said nut, and the spring f', substantially as shown and described.

6. The combination, with the driving-shaft g, of the clutch member l, connected therewith, its centrifugal weight and toggle-actuating mechanism, the threaded rod f, the nut g' on said rod, the clutch member d', connected with said nut, and the spring f', substantially as shown and described.

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