(No Model.) 3 Sheets—Sheet 1.

G. M. EMERICK.

MECHANISM FOR OPERATING DUMB WAITERS.

No. 397,228. Patented Feb. 5, 1889.

Fig 1.

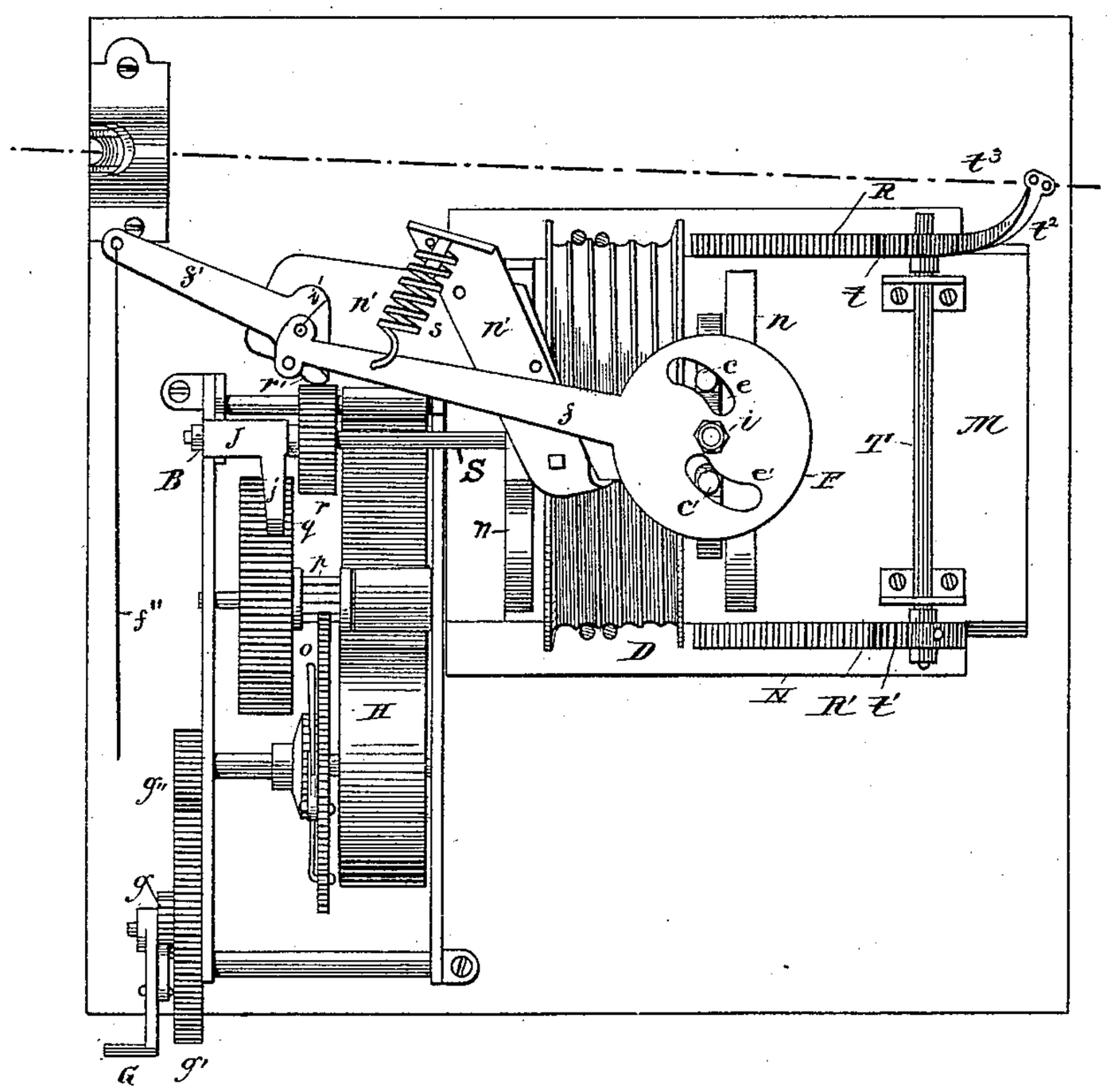
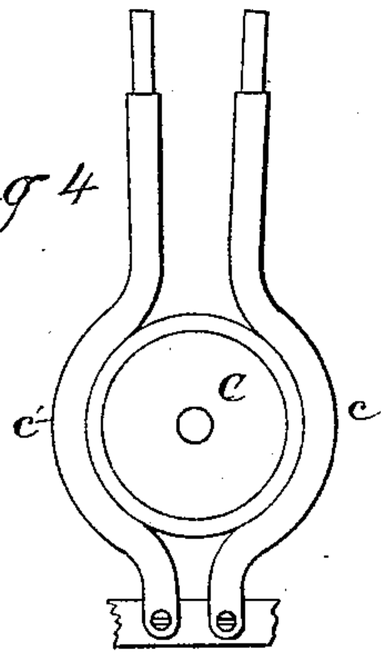


Fig 4



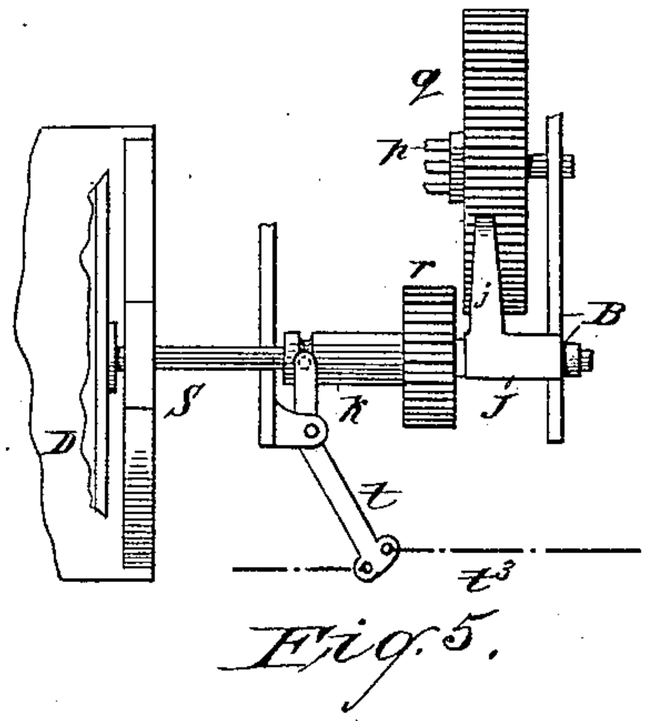


Fig 5.

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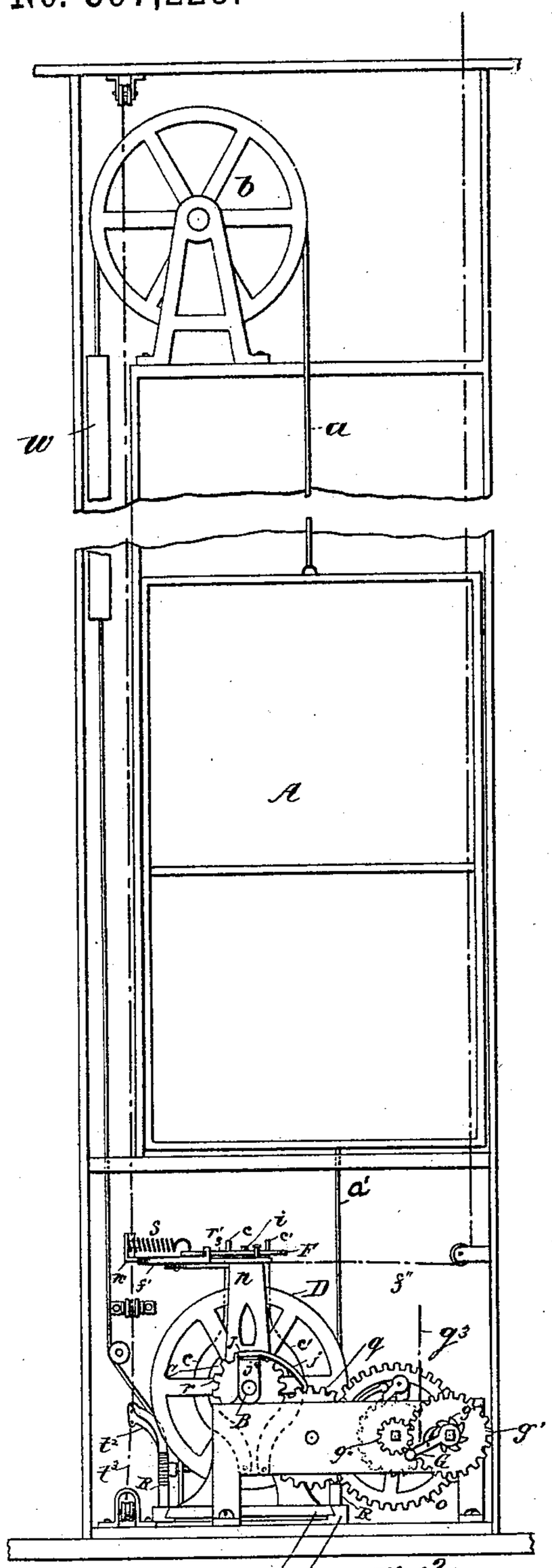

Fig 2

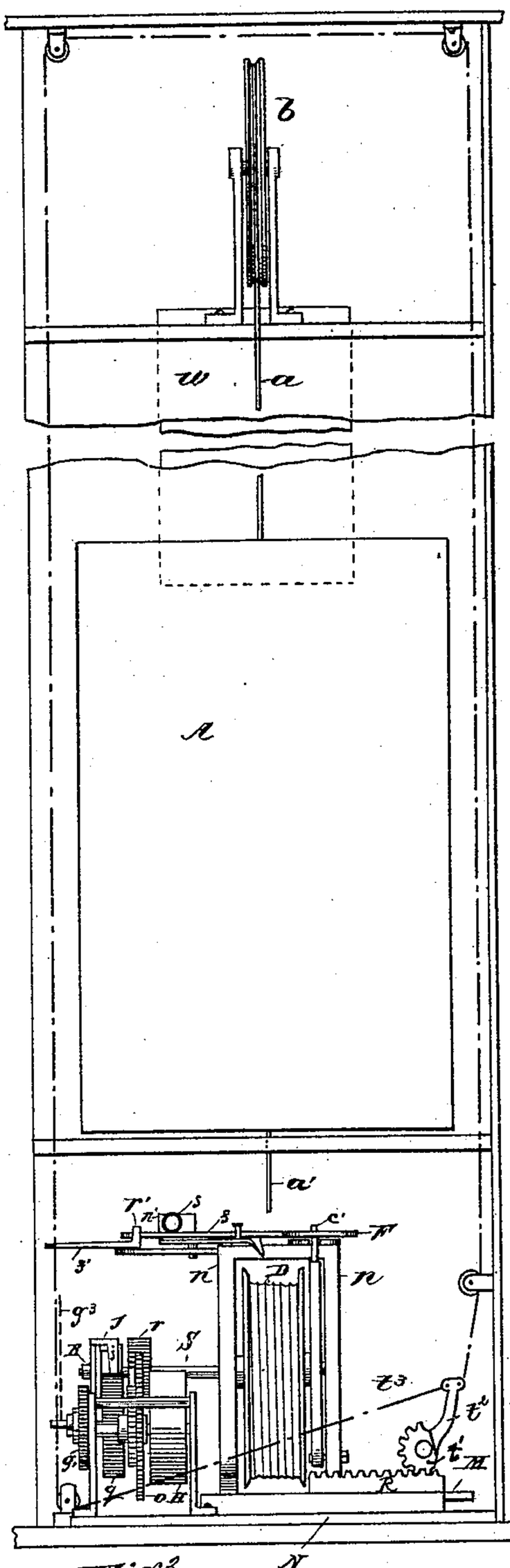

Fig 3

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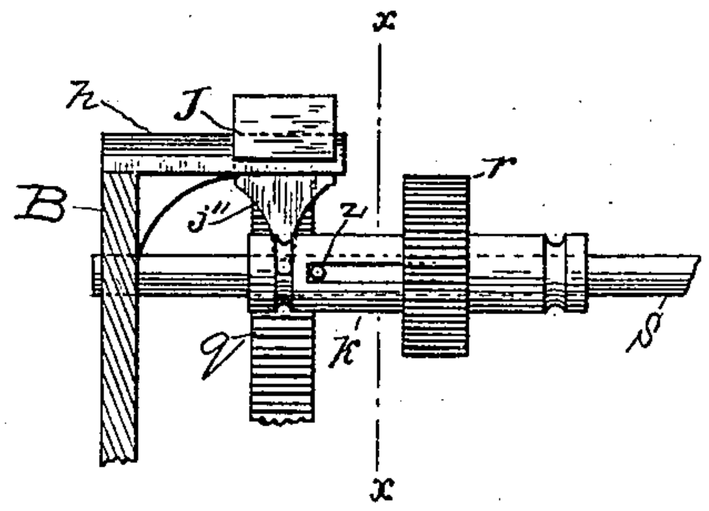

Fig. 6.

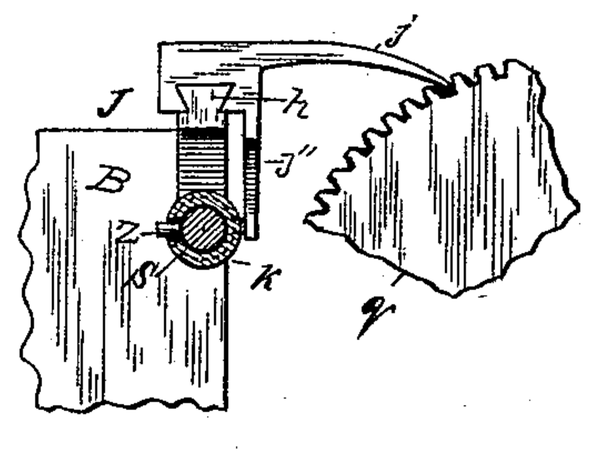

Fig. 7.

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UNITED STATES PATENT OFFICE.

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MECHANISM FOR OPERATING DUMB-WAITERS.

SPECIFICATION forming part of Letters Patent No. 397,228, dated February 5, 1889.

Application filed June 16, 1888. Serial No. 277,319. (No model.)

To all whom it may concern:

Be it known that I, GARRETT M. EMERICK, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Mechanism for Operating Dumb-Waiters, of which the following is a specification.

The dumb-waiters or light elevators generally in use in private houses or other buildings where moderate weights are to be handled are usually operated by some form of windlass, and these windlasses are worked by pulling an endless rope by hand. These elevators are not only slow of operation, but also liable to cause accidents, for letting go of the hauling-rope will generally allow them to fall at once. Besides, considerable strength is required to operate one of these elevators, especially where the height is great.

The object of my invention is to produce a motor and mechanism suitable for operating dumb-waiters or elevators where the weights to be lifted are moderate of such a simple character that it may be operated by any one however inexperienced, and I accomplish this object by means of the mechanism illustrated in the accompanying drawings, wherein—

Figure 1 is a plan view of the machinery for operating the elevator. Fig. 2 is a front elevation of an elevator with the operating mechanism in position. Fig. 3 is a side view of the same. Fig. 4 is a detail of the brake mechanism; Fig. 5, a plan view showing a modified construction of the mechanism for throwing the motor into and out of gear with the hoisting-drum. Fig. 6 is an elevation of the mechanism shown in Fig. 5, and Fig. 7 is an end view on line *x x* in Fig. 6.

In Figs. 2 and 3 of the drawings, A is the car, of any convenient form, which is lifted by the rope *a*, passing over the pulley *b* at the top of the elevator-shaft, and thence to the hoisting machinery, the car being counterbalanced in the usual manner by means of the weight W. The hoisting-rope *a* is led to a drum, D, to which it is directly secured, or to a wheel, around which it is passed several times, and then, returning to the car, the end of the rope is secured to its lower part, as at *a'*. The drum or pulley D is operated by any suitable motor, as a spring, as shown at H in the drawings, or by an electric or hydraulic motor through the agency of any suitable train of gear-wheels, as *o p q r*, arranged, as desired, for speed or power. Attached to the drum D, or to its shaft, is a brake-wheel, C, which is grasped between two brake-bars, *c c'*, pivoted at their lower ends to the frame of the hoisting machinery, as shown in Fig. 4, and curved so as to embrace a large portion of the circumference of C. Upon the upper part of the frame *n* is mounted a plate, F, pivoted at *i* and having a long lever-arm, *f*. In this plate are cut two curved slots, *e e'*, through which extend the upper ends of the brake-bars *c c'*. The two slots *e e'* are so formed as to constitute two double cams, which, when the plate F is revolved by moving the lever *f*, draw the brake-bars *c c'* closer together or move them apart. A strong spring, *s*, attached to the frame *n'*, is arranged to maintain a constant pressure upon the arm *f*, and thus clamp the brake-bars *c c'* upon the wheel C continually, unless intentionally relieved. To render it easier to operate the lever *f* against the pressure of the spring *s*, a second lever, *f'*, also pivoted to the frame *n'*, may be employed, the brake-cord *f''* being attached to its longer arm, while a pin, *r*, on the short arm engages with and throws the lever *f*. It is obvious that the second lever, *f'*, may be dispensed with and the brake-cord *f''* attached directly to the end of the lever *f*.

Two forms of mechanism are shown in the drawings for throwing the hoisting-drum D into and out of connection with the motor H, the first being illustrated in Figs. 1, 2, and 3, while the second is shown in Figs. 5, 6, and 7. In the first mechanism the drum D is mounted on a plate, M, which slides in grooves arranged in the base-plate N. On each side of this plate M, and parallel to its opposite sides, are two racks, R R', secured to the base N. A shaft, T, mounted on M, carries at each end a sector, *t t'*, gearing with the racks R R', and also a lever, t^2, to which the reversing-rope t^3 is attached. The shaft S of the hoisting-drum D works in bearings in the frame *n*, while its outer end is supported in a bearing upon the frame B. The gear-wheel *r* is mounted on this shaft, and connected with it is also a frame, J, which carries a fixed pawl, *j*. By pulling the reversing-rope t^3 the sectors *t t'* are revolved, and, operating in engagement with the racks R R', move the plate M forward or back, carrying with it the hoisting-drum D and shaft S with the gear *r* and pawl *j*, which are mounted on the shaft. It will be seen

that as the shaft S is shifted in one direction the gear r is drawn to one side out of connection with the gear q of the motor-train, while at the same time the pawl j engages with q and prevents its revolution, as shown in Fig. 1, while the shifting of the drum-gear in the opposite direction removes the pawl from q and throws the gear r into mesh with q, thus connecting the drum D with the motor-gear.

The arrangement illustrated in Figs. 5, 6, and 7 shows another mechanism for accomplishing the same purpose as the one described above. In this the drum D, with its gearing, may be mounted in the same frame, B, with the motor-gear, while the gear-wheel r is mounted on a sleeve, K, which slides on the shaft S, and is connected with it by a feather or stud, z. The shifting-lever t is pivoted to the frame of the machine at any convenient point and engages in a groove in the sleeve K in the ordinary manner, (shown in Fig. 5,) while the pawl-frame J is mounted on a slide, h, attached to the frame B. The pendent arm j'' engages in a second groove in the sleeve K, and moves with it when the latter is thrown by the lever t, carrying the frame J and pawl j. The operation of the mechanism shown in Figs. 5, 6, and 7 is similar in its results to the one above described. The lever t, operated by the rope t^3, moves the sleeve K, which carries the gear r and pawl j into and out of connection with the gear q.

The spring H should be of sufficient strength to operate the elevator for, say, twenty-four hours, and is arranged to be wound up by the crank G, which may be applied directly to the end of the spring-shaft or through the intervention of a train of gears, g' g'', as shown in Figs. 1 and 2, the crank being preferably connected with the first wheel, g', of the train by means of a ratchet-gear, g, as shown.

The reversing-rope t^3 extends from the lever t^2 to the top of the elevator-shaft and back to the lever t^2, being led over pulleys so placed as to carry it within convenient reach of persons both within and outside of the car A. The brake-rope f'' is led from the lever f' or f, to which it may be connected, if desired, through or near to the car to the top of the shaft, where the end is secured. A third cord, g^3, may be attached to the crank G and in a like manner led to the top of the shaft and the end there secured, being in reach from the car and from all the landings.

The operation of my improved elevator is as follows: the spring H is wound up, and, the car being at the bottom of the shaft, the rope t^3 is pulled to throw the pinion r into gear with the motor. The spring is now acting with all its force to revolve the drum D, but is prevented from doing so by the brake. The rope f'' is now pulled up, operating the levers f' and f and releasing the brake. The motor immediately begins to revolve the drum D, and continues to do so until the brake-rope f'' is released, when the spring s throws the lever f over, and, applying the brake, stops the car. When it is desired to lower the car, the reversing-rope t^3 is pulled in the opposite direction, throwing the gear r out of mesh with the gear q, while at the same time the pawl j catches q and prevents it from turning. The car is now held solely by the action of the brake, and it may be lowered, as desired, by pulling upon the brake-rope f'', or stopped by releasing it. It will be seen that the movements of the car, whether in hoisting or lowering, are at all times controlled by the brake, and that in case of accident or other occasion for sudden stoppage the movement of the car is instantly arrested by simply releasing the brake-rope.

It is obvious that the spring H unwinds a certain amount each time the car is lifted, and that when its power becomes too weak to raise the car it must be wound up anew. This may be done by the crank G; but as it is not always convenient to go to the place where the motor is situated for this purpose I have provided the cord g^2, attached to the crank G and led up the elevator-shaft in an accessible position. By pulling this cord the crank is raised, turning the wheel g' a portion of a revolution, and on releasing the cord the crank drops down again by its own weight, which is adjusted for this purpose, being permitted to do so by the ratchet-gear g. This operation is continued until the spring is sufficiently wound up, and may be performed from any landing or from the car itself.

It is obvious that other motors besides springs may be employed in combination with my improved mechanism for operating elevators; also, that a pulley may be used in place of the drum shown in the drawings.

What I claim, and desire to secure by Letters Patent, is—

1. In a mechanism for operating dumb-waiters or elevators, a hoisting-drum, in combination with a coiled spring and a train of two or more gear-wheels interposed between said motor and the drum, one of which gears is adapted to be moved laterally for throwing it into and out of mesh with the rest of the train to connect or disconnect the motor and the drum, a pawl for holding said gearing and motor stationary when the drum is disconnected from the motor, and a brake for controlling the movements of the drum, substantially as described.

2. In a mechanism for operating dumb-waiters or elevators, the combination of a hoisting-drum, D, a spring, H, and the train of gear-wheels o p q r, with the sliding sleeve K, upon which the gear r is mounted, the pawl j, connected to said sleeve by means of an arm, j'', the lever, and rope t^3, for operating said sleeve, and a brake for controlling the movement of the drum D, substantially as described.

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Witnesses:
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