

G. DRYDEN.
Governor and Safety Appliance to Elevators.
No. 220,709. Patented Oct. 21, 1879.

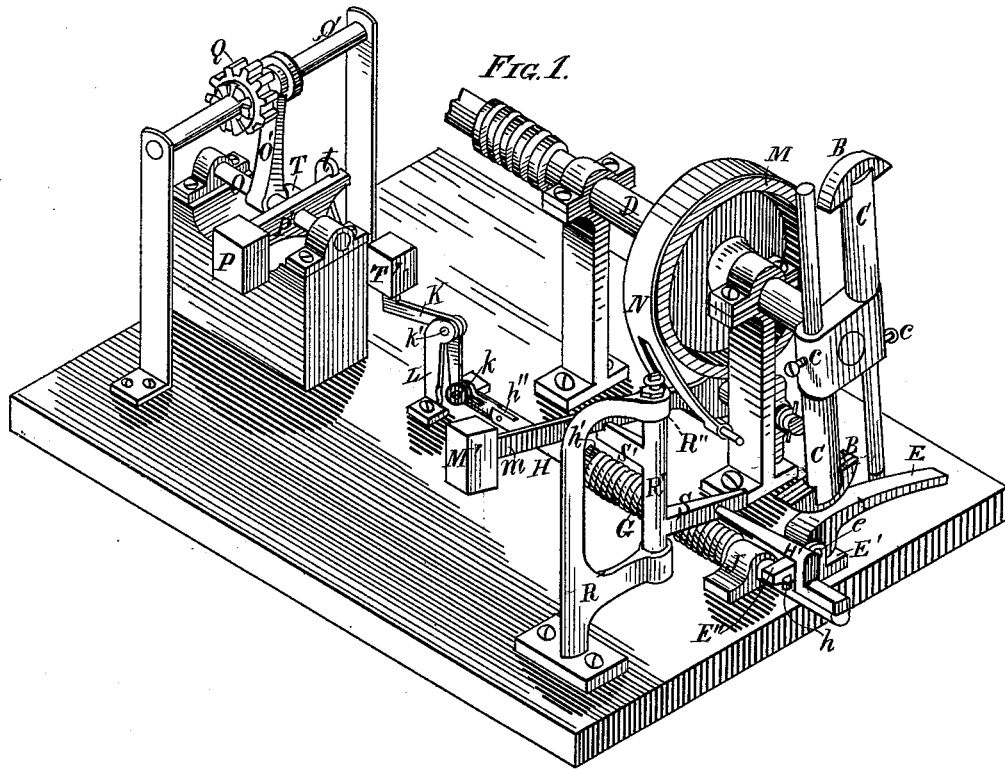


Fig. 3.

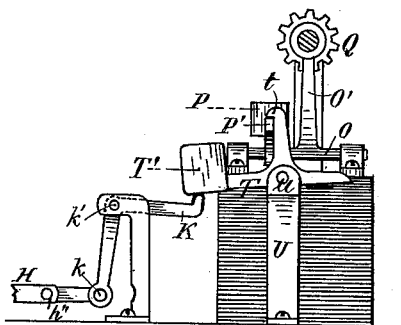
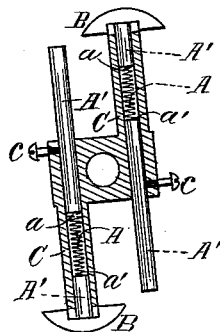


Fig. 2.



Witnesses:
Thomas W. Hutchins
Chas. Allen Taber.

Inventor:
George Dryden

UNITED STATES PATENT OFFICE.

GEORGE DRYDEN, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN GOVERNORS AND SAFETY APPLIANCES TO ELEVATORS.

Specification forming part of Letters Patent No. **220,709**, dated October 21, 1879; application filed September 11, 1879.

To all whom it may concern:

Be it known that I, GEORGE DRYDEN, of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Appliance for Stopping and Holding a Falling Elevator, of which the following is a specification.

My invention is fully illustrated by the accompanying drawings, which form part of this specification, like letters indicating like parts in the different figures thereof.

Figure 1 of the drawings shows my invention as applied to the worm-shaft of elevating machinery. Fig. 2 is a view of the principal feature of the invention; and Fig. 3 shows the automatic brake mechanism and the manner of connecting said automatic brake mechanism with the connecting-shaft H.

My invention consists of the spiral spring designated A in the drawings, said spring being inserted in the divided rod A', as shown in Fig. 2 of the drawings, and fastened therein by placing the two ends of the spring over the ends of the divided rod A' at the points *a* and *a'*, the two ends of said divided rod having each a thread therein, into which the spring A is placed and held therein by means of solder or its equivalent.

Upon one end of the rod A' is the shoe B, made in the shape shown in Figs. 1 and 2. The divided rod A', with the spiral spring inserted therein, is placed in the tube C, and held therein by the screw *c*.

Two of the appliances above described are placed upon the end of the worm-shaft D in the manner shown in Fig. 1, the two being constructed in exactly the same manner, and with the two shoes B pointing in opposite directions, so that when the worm-shaft D revolves a shoe shall pass over and by the plate E with every half-revolution of said shaft.

G shows another and larger spiral spring, placed over and upon the shaft H, one end of said shaft being held down by the bearing J in the manner shown in Fig. 1, and the opposite end of said shaft is attached to the lifter K by means of the pivot *k*. *h''* shows a universal joint in said shaft H, the lifter K being right-angular in shape and placed in the standard L, and held therein by and moving upon

the pivot *k'*; all of which is illustrated in Fig. 1 of the drawings.

M illustrates a pulley placed upon the worm-shaft D, with the metal band N placed over and about the periphery of the pulley M, so that when the weight M' is lifted the pulley can revolve upon the worm-shaft, but when the weight falls the band or brake N falls upon the pulley and stops the same, and thus stops the revolution of the shaft. This brake is, however, in itself well known and only used by me in combination.

O represents the rocker-shaft; O', the rocker-arm; P, the weight; P', the lever attached to said weight, which lever is fitted upon and keyed to the rocker-shaft O, and Q shows the clutch-gear placed upon the shaft Q', all of which form part of the well-known "automatic" now used for the purpose of shifting the belt, and thus stopping the elevator when it reaches either terminus of its route, but which, when used in combination with my invention, is made to shift the belt, and so stop the elevator whenever the elevator falls.

R represents a standard, constructed in the shape and manner shown in Fig. 1, with the turning-rod R', with the two horizontal arms S and S', the latter arm having a notch at the end thereof on which the arm or lever *m*, which holds the weight M' is placed, in order to lift the band or brake N from the pulley M—in short, to keep this brake off. The arm H' is to be made fast to the top of the shaft H in any manner desired, and constructed substantially in the shape shown in Fig. 1.

The plate E is made in the shape shown in Fig. 1, and is set in the standard E' and hung upon the pivot *e*. The knob *h* is used, in connection with the plate E, to hold the spring G when said spring is contracted, and thus plays an important part in holding the two brakes off, as will be hereinafter more fully described.

The collar *h'* is made fast to the shaft H, and used as a bearing for a man's hand when he contracts the spring G. The said collar also holds said spring in its proper position when contracted, the pressure from the spring pressing against the bearing J at one end, and against the collar *h'* at its opposite end, all of which is illustrated in Fig. 1.

T shows a rod or lever, (shown in Fig. 3,) with the weight T' attached to the end thereof, said rod to be set in the standard U and hung upon the pivot u, as shown in Fig. 3. The notched rocker-arm t is cast with and occupies a position perpendicular to said rod T.

Having described the mechanical construction of my appliance and the manner in which it is applied to the machinery used in moving and stopping elevators in buildings, I will proceed to set forth the operation of my invention.

Before the machinery is set in motion the operative must with his hand press against the collar h', and by so doing will at the same time contract the spiral spring G and move the shaft H in the same direction, until he is enabled, by raising the plate E at the end thereof over which the shoes B are to pass, to place the lower extension, E'', of said plate against the knob h. He must then turn the turning-rod R' (which is hollow and placed upon the pivot R'') until the arm S is brought against the end of the arm H', and at the same time the notched arm S' will be brought into such position that upon lifting the weight M' the lever m will rest upon the notch of the arm S', and thus the brake N will be raised from the periphery of the pulley M, so as to allow said pulley to revolve.

Upon examination of the drawings it will be readily seen that when the shaft H is moved and the spring G contracted, as before described, the lower end of the lifter E will be moved outward, and the upper or horizontal arm of said lifter will be consequently lowered. The weight P should be then raised by the operative, which will of course lower the opposite end of the arm or lever P'. The weight T' will then fall upon the upper horizontal arm of the lifter K, and the notch at the end of the arm t will then shut over the end of the arm P', and the clutch-gear Q will move back upon the shaft Q', and the automatic brake will be off.

The divided rods A' should be so adjusted that when the worm-shaft D is revolving at its usual and desired speed the two shoes B shall pass as near to the surface of the plate E as possible without hitting said plate. When the two rods A' are thus adjusted, they are to be held in position by the use of the screws c.

It will be readily seen that my invention is a governor for the speed of the worm-shaft, and at the same time affords greater security to life and property.

Whenever a pulley or belt breaks, or by any other accident the elevating machinery is cut off from the source of power, the elevator begins to fall, and consequently the drum over which is placed the cable by which the elevator is hung must of necessity increase its speed. As the speed of the elevator is increased by its own weight, the drum being connected with the worm-shaft, increases its speed, and

at that instant the additional centrifugal force produced by the increased rapidity of revolution of the worm-shaft spreads the spiral springs A, and one of the shoes B strikes the plate E, pressing said plate down. The spring G is instantly relieved, the shaft H moves back, the arm H' pressing against the arm S turns the turning-rod R', the notched arm S is removed from under the lever m, to which is attached the weight M', the weight falls, and the brake N is set upon the pulley M. At the same instant the lower arm of the lifter K is carried back, raising the horizontal arm thereof, whereby the weight T' is thrown up, the notched rocker-arm t is consequently thrown back, the weight P falls, moving the clutch-gear Q, and the automatic brake is set.

Thus two brakes are set automatically instantly and simultaneously upon the occasion of the speed of the worm-shaft being increased.

Whenever it is desired to increase the rapidity of movement of the elevating machinery, the rods A' must of course be readjusted, lifting the shoes B farther from the plate E, so as to avoid any sudden and unintentional setting of the brakes.

I claim as my invention—

1. The mode of setting the two brakes, as herein described, by means of expanding the spiral springs A by increased centrifugal force produced by the increased speed of the worm-shaft D, substantially in the manner described and shown, and for the purpose specified.

2. In combination, the divided rods A', with spiral springs A inserted therein, the tubes C, the screws c, and the shoes B, with the worm-shaft D, the plate E, with extension E'', the standard E', the shaft H, with universal joint h'', the spiral spring G, the collar h', the bearing J, the knob h, the arm H', the standard R, with turning-rod R', the horizontal arm S, and notched arm S', the weight M', with lever m, the brake N, and pulley M, constructed and arranged substantially in the manner described and shown, and for the purpose specified.

3. In combination, the divided rods A' with spiral springs A inserted therein, the tubes C, the screws c, and the shoes B, the worm-shaft D, the plate E, with extension E'', the standard E', the shaft H, with universal joint h'', the spiral spring G, the collar h', the bearing J, and the knob h, with the lifter K, the standard L, the weight T', the rod or lever T, with notched rocker-arm t, the standard M, the rocker-shaft O, the rocker-arm O', the weight P, the lever P', the shaft Q', and the clutch-gear Q, constructed and arranged substantially in the manner described and shown, and for the purpose set forth.

GEORGE DRYDEN.

Witnesses:

FRANCIS M. BOUTWELL,
CHAS. ALLEN TABER.