

No. 688,678.

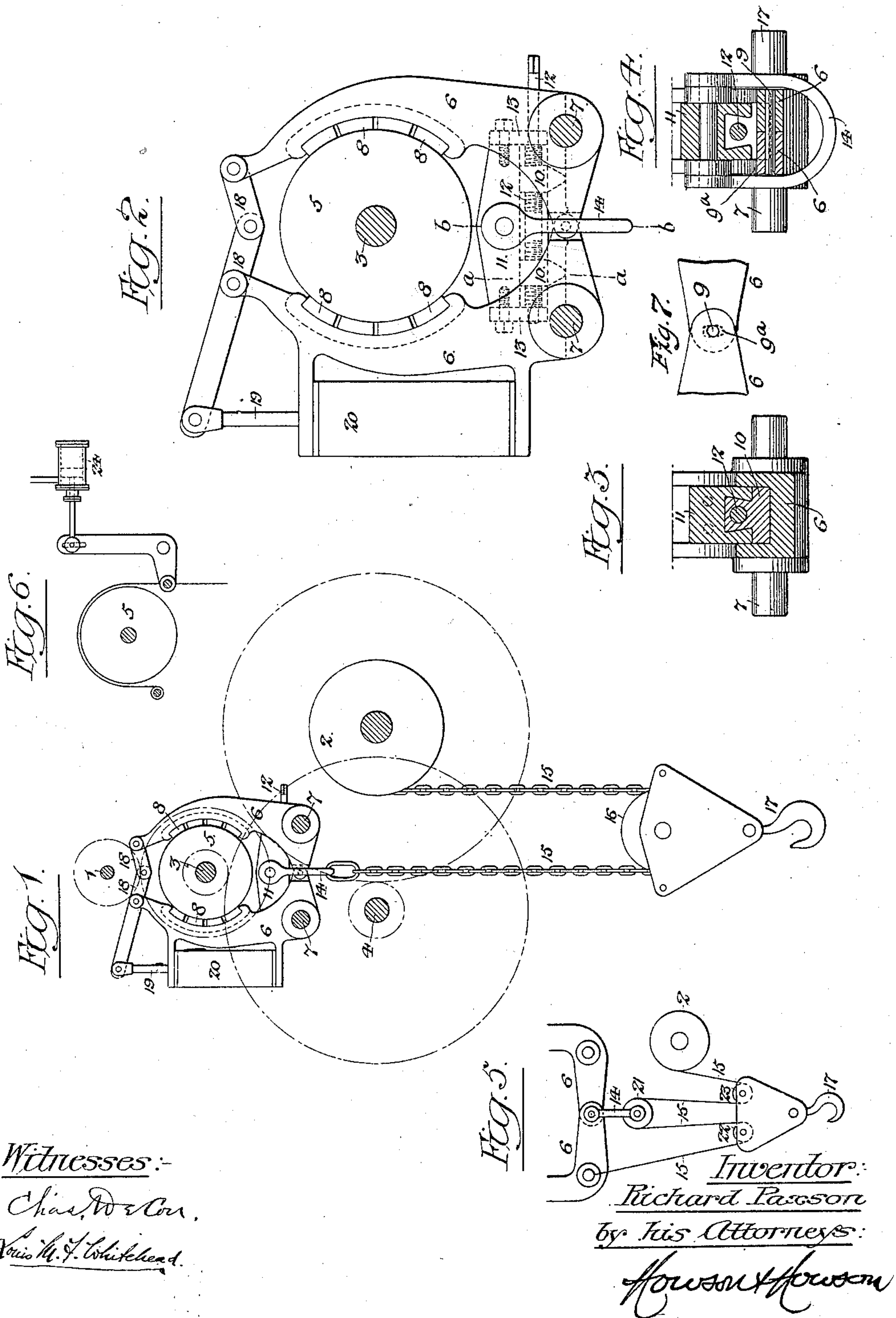
Patented Dec. 10, 1901.

R. PAXSON.

BRAKE FOR HOISTING MECHANISM.

(Application filed Jan. 25, 1901.)

(No Model.)



Witnesses:-

Chas. W. Con.  
Vernon M. F. Whitehead.

Inventor:  
Richard Paxson  
by His Attorneys:

Howson & Howson



# UNITED STATES PATENT OFFICE.

RICHARD PAXSON, OF PHILADELPHIA, PENNSYLVANIA.

## BRAKE FOR HOISTING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 688,678, dated December 10, 1901.

Application filed January 25, 1901. Serial No. 44,722. (No model.)

*To all whom it may concern:*

Be it known that I, RICHARD PAXSON, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain  
5 Improvements in Brakes for Hoisting Mechanism, of which the following is a specification.

The object of my invention is to so construct a brake for hoisting mechanism that  
10 the braking effect in lowering or sustaining the load will be directly proportionate to the weight of said load, the device being preferably so constructed that the braking effect is derived from that portion of the load carried  
15 by the fixed or standing end of the hoisting chain or rope and is such as to prevent the descent of the load, except there is a reverse movement of the hoisting mechanism under control of the attendant.

20 In the accompanying drawings, Figure 1 is a side elevation of sufficient of a hoisting-machine to illustrate my present invention. Fig. 2 is an enlarged elevation of part of the same. Fig. 3 is a transverse section on the line *a a*,  
25 Fig. 2. Fig. 4 is a transverse section on the line *b b*, Fig. 2. Figs. 5 and 6 are views illustrating modifications of the invention, and Fig. 7 is a detail view hereinafter referred to.

In Fig. 1 of the drawings, 1 represents the  
30 primary driving-shaft of the hoist, and 2 the hoisting-drum, said primary shaft being driven by an electric or other motor and power being transmitted from the same to the hoisting-drum through any suitable system of gearing—for instance, by means of interposed shafts 3 and 4 and a system of spur-gearing such as is represented by the dotted  
35 circles.

The brake-drum is represented at 5, this  
40 drum being located in any desired position and being connected to the hoisting-drum in any preferred way. In the present instance the brake-drum is secured to one of the power-transmitting shafts 3, this being a convenient  
45 disposition of it and one which will be most likely to be adopted in practice.

The brake-levers 6 are mounted upon transverse shafts 7, which are intended to be suitably supported by the framework of the hoist,  
50 and these brake-levers carry shoes 8 for bearing upon the brake-drum 5. The short arms of the brake-levers overlap each other and

are connected by a transverse pin 9, as shown in Fig. 4, so that the two levers are compelled to operate in unison, the pin 9 being adapted  
55 to slightly-elongated slots 9<sup>a</sup> in the overlapping portions of the brake-levers, so that it does not interfere with the movement of said levers, as shown in Fig. 7.

The short arms of the brake-levers 6 are  
60 acted upon by bearing-blocks 10, carried by an equalizing-bar 11, which has a longitudinal screw-shaft 12, held in position on the bar by the end caps 13 of the latter, this screw-shaft having right and left hand threads, one  
65 adapted to a threaded opening in one of the bearing-blocks 10 and the other to a threaded opening in the other bearing-block, so that by turning the screw-shaft by means of a handle or wrench applied to the squared outer  
70 end of the same the bearing-blocks 10 may be moved toward or from each other and the effective length of the short arms of the levers may thus be regulated to accord with the desired amount of pressure intended to be im-  
75 parted to the brake-shoes. The equalizing-bar 11 has a depending yoke 14, to which is connected the fixed or standing end of the hoisting chain or rope 15, the latter passing around a sheave 16 on the head of the hoist-  
80 ing-hook 17 and thence to the hoisting-drum 2. A portion of the weight of the load is thus exerted directly upon the short arms of the brake-levers 6, and the brake-shoes are pressed into contact with the surface of  
85 the brake-drum with a force proportionate to the weight of said load, the amount of braking force exerted being governed by the adjustment of the bearing-blocks 10. Preferably the braking force is just enough to  
90 prevent the load from descending by its own weight, such descent being effected by running backward the motor which operates the initial power-shaft 1. Hence the descent as well as the lift of the load is under the control of the attendant, and accidents due to  
95 the running down of heavy loads are rendered impossible.

In order to release the brakes when the load is being hoisted, I connect the upper ends of  
100 the brake-levers by means of a pair of links 18, forming a toggle, one of the links being extended, so as to constitute a lever to which is connected the core 19 of a solenoid-magnet



20, mounted upon one of the brake-levers. When current is directed to the motor, so as to turn the same forwardly in hoisting, current is likewise directed into the coils of the magnet 20, and the armature-core 19 of the same is attracted so as to straighten the toggle formed by the links 18, and thus force the brake-levers 6 apart from each other sufficiently to carry their shoes out of contact with the surface of the brake-drum. When the current is switched off from the motor or reversed, it is likewise switched off from the magnet 20, so that the brakes are again free to act. When the toggle is straightened, the upper ends of the brake-levers 6 cannot approach each other. Hence no amount of pressure upon the lower arms of the said levers can bring them into contact with the brake-drum.

Various modifications or changes in the structure of the apparatus may be adopted within the scope of my invention. For instance, the yoke 14 may be hung directly to the short arms of the brake-levers, as shown in Fig. 5, and, if desired, only one brake-lever may be used instead of two. While I prefer, also, to connect the brake lever or levers to the fixed or standing end of the hoisting rope or chain, this is not essential in all cases. Thus in Fig. 5 I have shown the yoke 14 as equipped with a sheave 21, around which passes a bight of the hoisting rope or chain interposed between sheaves 22 and 23 on the head of the hoisting-hook, the fixed or standing end of the chain being connected to a portion of the fixed structure of the hoist. A strap-brake may replace the lever-brake, if desired, as shown in Fig. 6, and in cases where fluid under pressure is used as the motive power a power-cylinder with piston and piston-rod may replace the magnet and armature as a means of releasing the brake when the load is being raised, such power-cylinder being shown at 24 in Fig. 7.

The invention is also applicable to disk-brakes as well as to drum-brakes.

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

1. The combination in braking mechanism for hoisting-machines, of a brake-surface, a lever-brake acting thereupon, and a connection between said brake and the hoisting chain or rope, said connection having a movable bearing upon the brake lever or levers whereby the effective leverage of the latter may be varied, substantially as specified.

2. The combination in braking mechanism for hoisting-machines, of the brake-surface, a pair of brake-levers, an equalizing-bar connected to the hoisting chain or rope, blocks mounted upon said bar and bearing upon the

brake-levers, and right and left screws for simultaneously moving said blocks from and toward the fulcrums of the levers, substantially as specified.

3. The combination in braking mechanism for hoisting-machines, of the brake-surface, a pair of brake-levers connected so as to move in unison, and a connection between said brake-levers and the hoisting chain or rope, substantially as specified.

4. The combination in braking mechanism for hoisting-machines, of the brake-surface, a brake acting thereupon, a connection between the said brake and the hoisting chain or rope whereby the weight of the load, or a portion thereof, is exerted to apply the brake shoe or strap, and means for moving said brake to inoperative position when the load is being raised, substantially as specified.

5. The combination in braking mechanism for hoisting-machines, of the brake-surface, a brake acting thereupon, a connection between the said brake and the hoisting chain or rope whereby the weight of the load, or a portion of the same, is exerted to apply the brake, an electromagnet, and a connection between the brake-lever and the armature of said magnet whereby the operativeness or inoperativeness of the brake is controlled by the magnet, substantially as specified.

6. The combination in braking mechanism for hoisting-machines, of the brake-drum, a pair of brake-levers acting thereupon, a connection between the same and the hoisting chain or rope whereby the weight of the load, or a portion thereof, is exerted to apply the brake, and power mechanism for moving the brake-levers to operative or inoperative position independently of the action of the load thereupon, substantially as specified.

7. The combination in braking mechanism for hoisting-machines, of the brake-drum, a pair of brake-levers acting thereupon, a connection between the same and the hoisting chain or rope, whereby the weight of the load, or a portion thereof, is exerted to apply the brake, a pair of toggle-links connecting the brake-levers, one of said links being extended beyond its lever, and a magnet controlling said extended link, whereby the toggle can be straightened and the levers separated so as to be rendered inoperative by the action of the load thereupon, substantially as specified.

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

RICHARD PAXSON.

Witnesses:

F. E. BECHTOLD,  
JOS. H. KLEIN.