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Nov. 17, 1936. F. P. PORTER 2,061,209

BRAKE CONSTRUCTION FOR HOISTS

Original Filed April 15, 1935

Fig. 2.

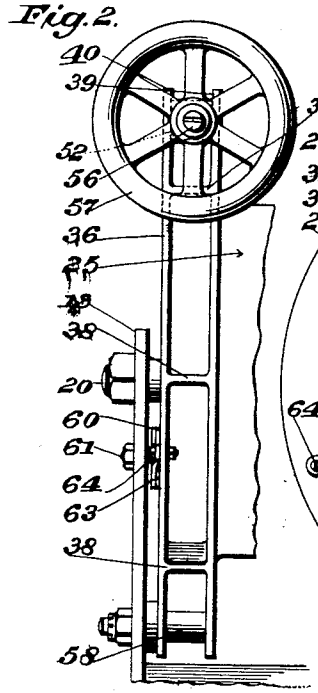


Fig. 1.

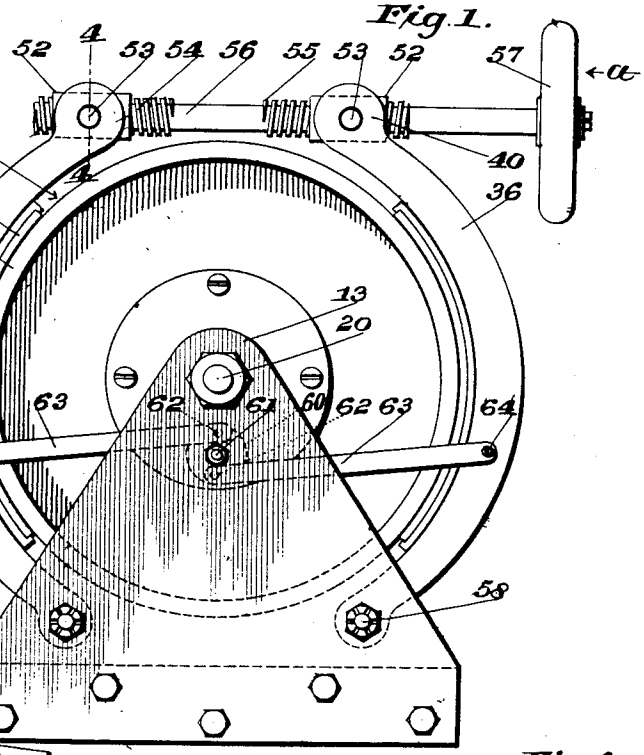


Fig. 3.

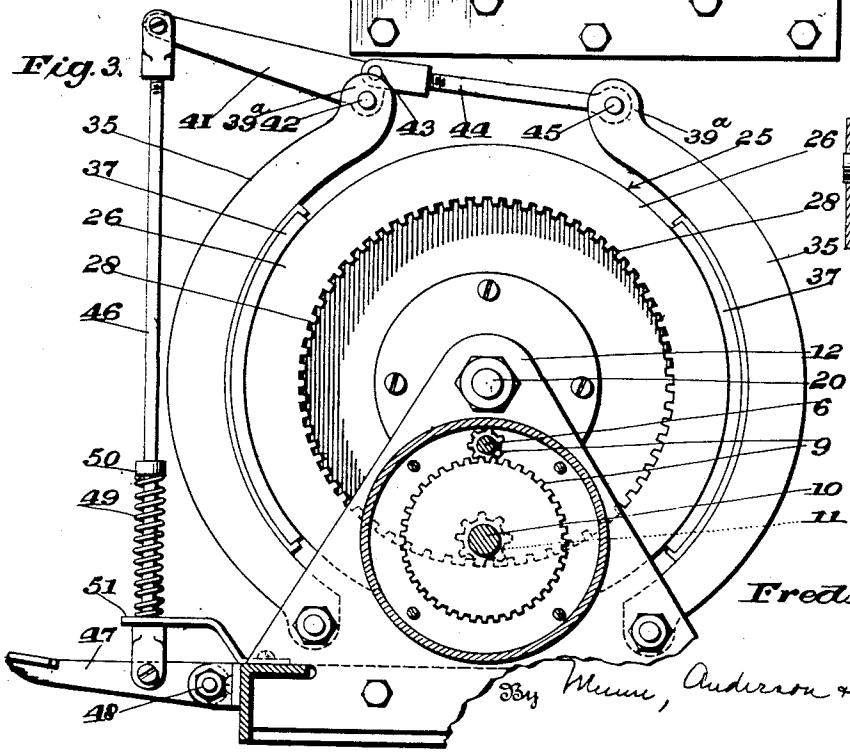
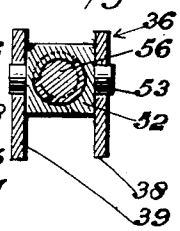
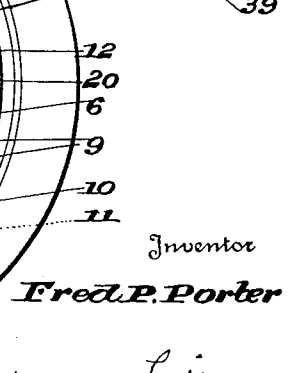


Fig. 4.





Inventor

Fred P. Porter

By Munn, Anderson & Liddy

Attorneys

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BRAKE CONSTRUCTION FOR HOISTS

Fred P. Porter, Kellogg, Idaho, assignor to Coeur D'Alene Hardware & Foundry Company, Wallace, Idaho, a corporation of Idaho

Original application April 15, 1935, Serial No. 16,473. Divided and this application March 3, 1936, Serial No. 66,924

2 Claims. (Cl. 188—74)

This invention relates to improvements in hoists, but more particularly to a brake construction for use in connection therewith, and its object is as follows:

To provide a duplex braking system of the externally contracting type for a single drum, said drum having thickened end flanges to serve the purposes of said system which are to periodically stop the drum, this brake being foot-operated, and to permanently lock the drum, this brake being hand-operated, the hand-operating means of the latter brake being mounted solely on the free ends of the brake posts which are connected by equalizer means which prevents any floating or wavering of said brake posts and thus insures an equal amount of turning of each post and prevents the brake linings from dragging on the brake seats when the posts are turned outwardly.

Other objects and advantages will appear in the following specification, reference being had to the accompanying drawing, in which:—

Figure 1 is an end elevation of one end of a hoist showing the hand-operated brake and the post equalizer,

Figure 2 is a detail side elevation looking in the direction of the arrow *a* in Figure 1, particularly showing the web construction of one of the posts,

Figure 3 is a sectional view of the hoist, illustrating that end of the drum opposite to the one shown in Figure 1, and showing the foot-operated brake, and

Figure 4 is a detail cross section taken on the line 4—4 of Figure 1, showing one of the swiveled blocks.

This application is a division of an application for patent for a geared hoist filed by Fred P. Porter on April 15, 1935, Serial No. 16,473. As much of the hoist as is more or less immediately concerned with the brake construction claimed in this application is briefly described as follows: A drive shaft 6 (Fig. 3) rotates a train of gearing 9 to operate the driven shaft 10. This shaft carries a pinion 11 in mesh with an internal gear in one thickened end of the hoist drum.

A pair of end plates or drum supports 12, 13 upstanding from a bed plate, these parts collectively constituting a foundation, stationarily support the drum shaft 20. The drum, generally designated 25, is journaled on said shaft. It has thickened flanges 26 (Fig. 3) and 27 (Fig. 1). The purpose of thickening each of the two flanges is to utilize the peripheries or outer faces as brake seats. The end of the drum which has the thickened flange 26 is hollowed out (Fig. 3) to provide for the internal gear mentioned above and now designated 28. It is with this gear that the pinion 11 meshes as stated, and it is by this means that the drum 25 is driven.

In order to control the drum, provision is made of a duplex braking system. It is here that the description of the structure incidental to the hoist of the parent application ends, and the description of the invention claimed herein begins.

The duplex brakes comprise pairs of brake posts 35 (Fig. 3) and 36 (Fig. 1). They are arcuate in shape so as to conform to the end flanges 26, 27 with which they coact. The brake posts have shoes or linings 37 which are engageable with the brake seats, and these linings are capable of replacement when worn. In practice the brake posts are made of fabricated steel. This construction is suggested by the webbing 38 (Fig. 2). The purpose of this construction, as already brought out, is lightness without sacrifice of strength. The web construction is preferable for another reason, namely that the upstanding sides 39, 40 (Fig. 2) of the brake posts can be utilized to house certain essential elements of the operating mechanism.

As concerns the brake posts 35, this mechanism consists of a bellcrank 41 (Fig. 3) which is pivoted between one pair of sides as at 42, and has its remaining pivot 43 connected with an adjustable link 44 which extends across to the companion post between the upstanding sides 39a of which it is pivoted as at 45. The free end of the bellcrank 41 has one end of a rod 46 connected to it, the other end of said rod being pivoted to a pedal 47 which enables the service operation of the brake 35.

By service operation is meant a periodical operation as occurs in stopping and starting. The pedal 45 is pivoted to the bedplate at 48. A spring 49, seated between a stop 50 on the rod 46, and a bracket 51 on the bedplate tends to hold the brake 35 in its released position. The brake is operated against the tension of the spring, and when foot pressure is removed from the pedal the brake automatically assumes its released position.

As concerns the brake posts 36 (Fig. 1), the previously mentioned mechanism consists of blocks 52 which are swiveled at 53 between the upstanding sides 39, 40. These blocks have right and left hand threaded bores which contain the corresponding threads 54, 55 of a brake shaft 56. This shaft carries a handwheel 57, or its equivalent, for the purpose of using hand power to permanently set the brakes 36 upon desiring to

fixedly hold the brake drum **25** for any considerable period.

It is important herein to preserve the distinction between the two brake mechanisms, the one coacting with the brake flange **26** being of a temporary service character, the one coacting with the brake flange **27** being of a more permanent or locking character. It is desired to state, further, that when the hoist is manufactured in such large sizes that man power cannot be entrusted to working the two braking mechanisms, the pedal **47** and handwheel **57** are intended to be replaced with power-actuated means.

Brake equalizers can be used in connection with each pair of posts **35**, **36**, but a brake equalizer is shown only in connection with the posts **36** (Fig. 1). This equalizer comprises a disc **60**, or its equivalent, which is turnably mounted at **61** on the end plate **13**. At diametrically opposite points this disc has pivot connections **62** for links **63** which extend in opposite directions to places of pivotal connection **64** with the posts **36**. As these posts are turned on their pivots **58** the equalizers **60**, **63** insure their turning an equal amount, thereby preventing the brake linings **37** from dragging or rubbing on the brake seats.

I claim:

1. In a hoist, a brake of the external contracting type, comprising a drum which has a flange providing a brake seat, a shaft for the drum, supporting means for the shaft including an end plate, a pair of brake posts coacting with the flange and means by which said posts are mounted at one end on said end plate, means mounted solely on the other ends of the posts for opening and closing them with respect to the flange, and equalizer means consisting of an element pivoted directly on the end plate and links having their remote ends attached to the posts and their near ends connected at diametrically opposite pivot points on said element so as to equalize the opening and closing movements of the posts.

2. In a hoist, a hoisting drum and a foundation for the shaft thereof, a brake construction for said hoisting drum comprising duplex brake mechanisms consisting of pairs of posts, means by which all of the posts are movably mounted at one end on the foundation, opening and closing means for one pair of posts, and means extending from said means to a pedal on the foundation for the intermittent service operation of the respective pair of posts toward and from one of a pair of flanges on the drum, and means to open and close the other pair of posts, said means being mounted solely on the free ends of the respective posts, said means being adapted to lock said posts in a fixed braking position with respect to the other flange on the drum.

FRED P. PORTER.