(No Model.) 2 Sheets—Sheet 1.

J. G. SPEIDEL.

HOISTING APPARATUS.

No. 362,329. Patented May 3, 1887.

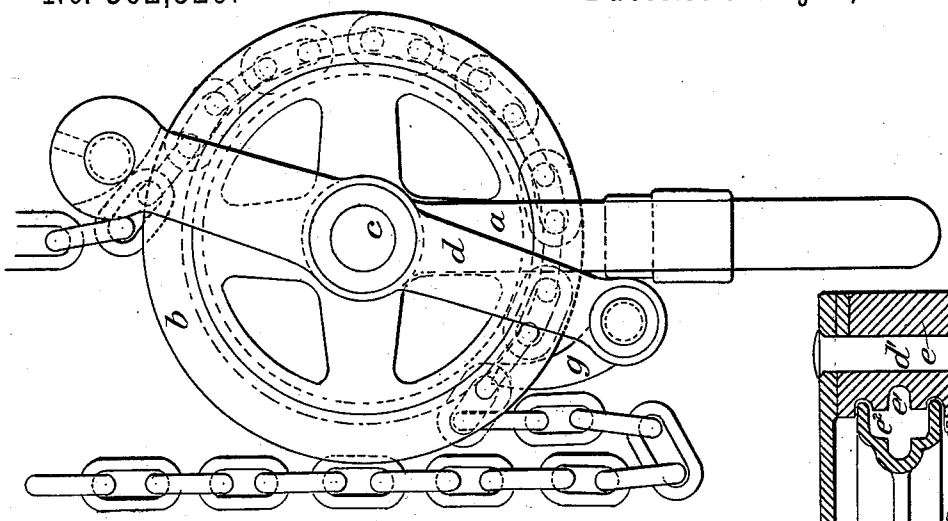

Fig. 2.

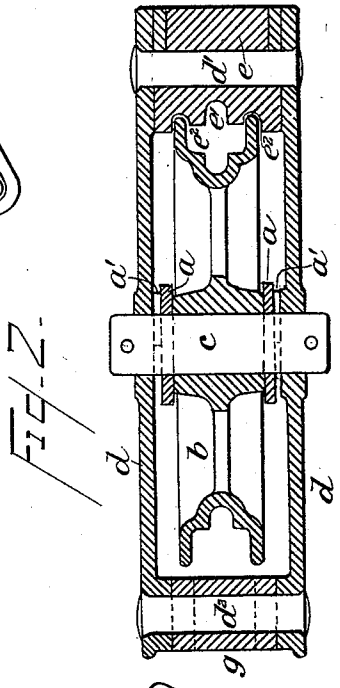

Fig. 3.

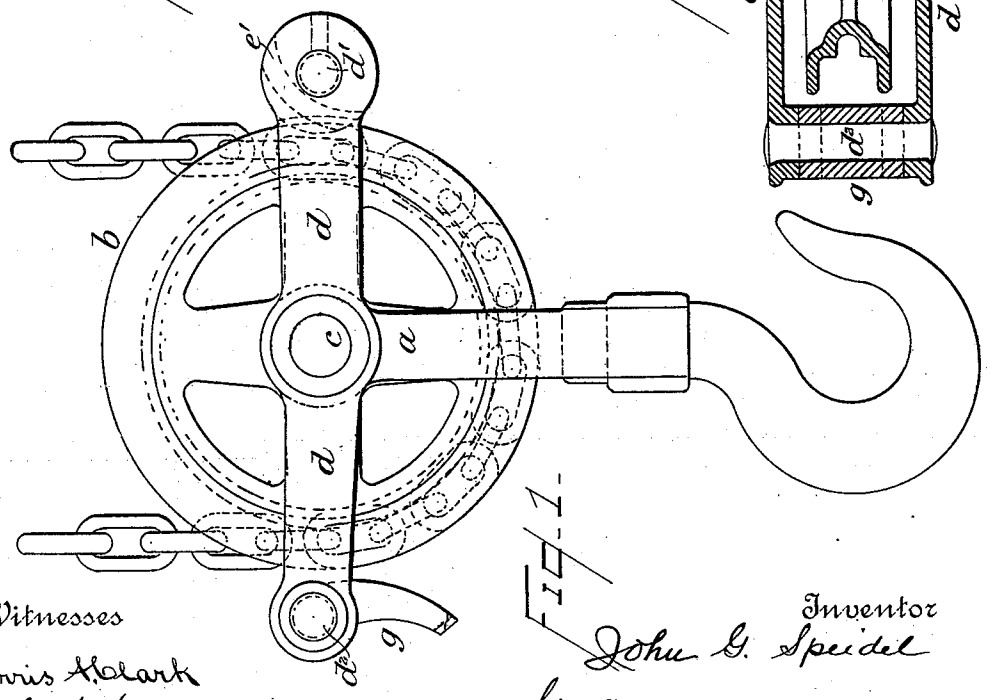

Fig. 1.

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 4.

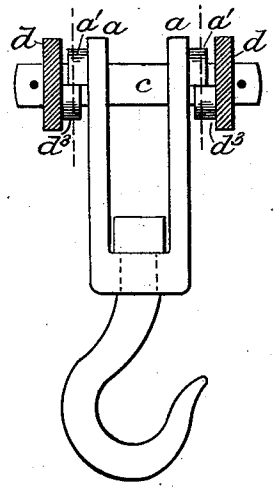


Fig. 5.

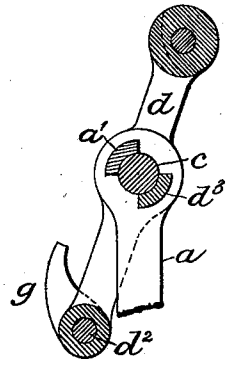
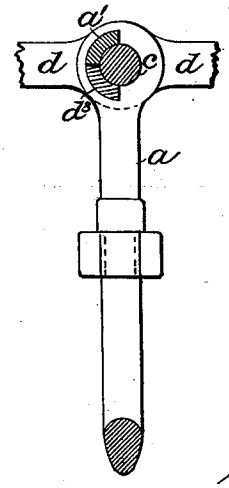


Fig. 6.



WITNESSES.
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UNITED STATES PATENT OFFICE.

JOHN G. SPEIDEL, OF SCRANTON, PENNSYLVANIA.

HOISTING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 362,329, dated May 3, 1887.

Application filed July 2, 1886. Ser'al No. 206,928. (No model.)

To all whom it may concern:

Be it known that I, JOHN G. SPEIDEL, a citizen of the United States, residing at Scranton, in the county of Lackawanna and State of Pennsylvania, have invented certain new and useful Improvements in Blocks for Hoisting Apparatus; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in hoisting machinery, and more particularly to an auxiliary or lower block adapted to be used in connection with all kinds of hoisting apparatus—such as cranes, derricks, pulley-blocks, and the like—where it may be desirable to obtain different speeds in hoisting. The lower block, from which the load is suspended, is itself suspended by the lifting-chain from an upper hoisting-block of any suitable construction, the latter being operated by a hand-chain or by power, according to the conditions under which the apparatus is used.

The object of the invention is to apply to a lower block or pulley a device for locking the lifting-chain to the sheave of such block in such a way that the sheave shall move at the same speed as the lifting-chain, and also be brought into a vertical line with the suspended weight, so that the power is exerted in a direct line above the center of the load, whereby the axis of the sheave is brought into a straight line with the center of the lifting-chain, and the center of gravity of the load, and which on lowering the load to or beyond the point at which the locking device was applied will be automatically released, permitting the chain to regain its normal position and the load to descend slowly to any point desired. The device is so arranged, however, that it need not interfere with the ordinary operation of the lower block when hoisting at slow speed, during which time it performs only the function of a guide for the chain, as in ordinary blocks, being simply carried by the block without producing any effect upon the hoisting-chain, which travels on the sheave in the ordinary manner.

The invention is fully illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of a pulley-block, suspending-hook, and lifting-chain, with my improved locking device attached, although not in operation. Fig. 2 is a horizontal section of the same, the central pin or shaft being shown in elevation. Fig. 3 is a side elevation showing the locking device in its operative position when hoisting at a fast speed. Fig. 4 is a side elevation with the pivoted lever in section. Figs. 5 and 6 are sections taken through the stops, and showing their relation with the lever in different positions.

The same letters indicate like parts throughout the drawings.

The letter *a* indicates the vertical shears of a pulley-block, which project vertically down below the block, and support the swiveled hook, from which the load is suspended. In these shears is fixed the pin *c*, on which revolves the sheave *b*, which may be of ordinary construction.

The pin *c* projects beyond the shears *a*, and upon it is mounted a double lever composed of two bars, *d d*, which, being pivoted on the pin, is free to move outside the shears and sheave, as shown in Fig. 2; but it should be understood that instead of having the bars *d d* outside upon the pin *c*, they may be placed next to the sheave, and the shears *a* be outside, the operation being exactly the same. These bars are connected at one end by a pin, *d'*, upon which is rigidly fixed a distance piece or block, *e*, provided with grooves e' e^2 e^3, Fig. 2, to receive the chain and flanges of the sheave, as indicated in Fig. 3.

If the sheave is used without flanges, the grooves e^2 e^3 are not necessary. The opposite ends of the bars are similarly connected by a pin, d^2, and distance-piece *g*, which forms the pawl for locking the chain, said distance-piece being mounted so as to turn freely upon the bolt d^2.

As shown in Fig. 2, a space is left between the vertical shears *a* and the bars *d* when the latter are horizontal, and stops a' d^3 are formed, respectively, on each, so that the movement of the bars on the pin *c* is limited. These stops may be placed upon both sides, if desired.

The lifting-chain which passes around the sheave is shown in Fig. 1 in its ordinary position when running freely for hoisting at a slow speed, at which time it passes freely through the space between the sheave and the

distance-piece *e*, the bars *d* being then horizontal. The ends of the bars which support the part *e* are made heavier than the opposite end, so that the effect of gravity is to lower that end to the position shown in Fig. 1, when the stops prevent further movement.

Mounted upon the pin d^2, and forming part of the distance-piece thereon, is a swinging pawl, *g*, which, when not in use, hangs down vertically, as shown in Fig. 1. The end of the pawl is grooved, so that it may be caused to engage with the chain-links, as shown in Fig. 3.

In hoisting at fast speed the end of the pawl is turned up and caused to bear against one of the chain-links, one end of the bars *d* being slightly depressed. This locks the chain to the sheave so that it cannot slip. If hoisting is now commenced, the sheave and chain will turn on pin *e*, carrying with them the bars *d*, until they reach the position shown in Fig. 3. The chain is thus carried so far inward that the force of lifting is exerted in a straight line through the axis of the sheave and the center of the suspended load. The chain, being firmly locked to the sheave by pawl *g* on the lower end of the bar, Fig. 3, is carried around the sheave by the distance-piece *e*, which is provided with grooves to give the chain a good bearing. In this way the strain is carried by the distance-piece *e* through the bars *d d* to pin *e*, from which the shears with the load are suspended. The hoisting will now continue at fast speed to the desired point, the lifting-chain slackening upon one side, as shown in Fig. 3. When the load is lowered to or below the point at which the locking device was applied, the slack will be taken up, and by the continued movement of the chain the levers will be automatically lowered to their former horizontal position, the pawl automatically releasing itself at the proper time and permitting the load to slowly descend as far as may be necessary.

If desired, a spring may be applied to the pawl *g* to hold it in any desired position; but I have not found such spring essential in use.

It should be understood that instead of the specific device herein described and illustrated I consider my invention broad enough to include such a device, for instance, as a sheave having a sprocket-rim to prevent slipping of the chain, and a pawl on the pivoted lever adapted to bear either upon the sprocket-teeth or against a ratchet-rim, formed with or secured to the sheave; or, instead of the pawl, a cam or eccentric or other equivalent locking device might be placed on the end of the pivoted lever in order to lock the chain to the sheave.

Having thus described my invention, what I claim is—

1. The combination, with the lower block, of a two-speed hoisting apparatus, said block having a sheave carrying the hoisting-chain, of a pivoted lever carrying a locking pawl or dog adapted when in horizontal position to permit the free revolution of the sheave, but capable also, when the dog or pawl is caused to engage with the chain, of automatically assuming such a position as to lock the chain to the sheave at both ends of said lever, and thus prevent the revolution of the sheave, substantially as and for the purposes set forth.

2. A locking device for a two-speed hoisting apparatus, consisting of a lever mounted upon the axis of the sheave of the lower block and inclosing said sheave and having a movable pawl or dog pivoted at one of its ends, substantially as described.

3. In combination with a pulley-block and the hoisting-chain thereon, a lever pivoted to the axis of the sheave and inclosing said sheave so as to leave a free passage for the chain when lifting at slow speed, and having a pawl for engagement with the chain upon one side of the sheave, whereby the movement of the chain will cause the lever to move sufficiently to lock the chain to the opposite side of the sheave, substantially as described.

4. The combination, with the frame and sheave composing a pulley-block, of the pivoted lever inclosing the sheave, and having a weighted end and stops on the frame and lever to limit the movement of such lever, substantially as described.

5. The combination, with the lower block and sheave of a hoisting apparatus, of the pivoted lever *d d*, having the grooved distance-piece, and the pawl, substantially as described.

6. The combination, with the lower pulley-block, sheave, suspending-hook, and lifting-chain, of a pivoted lever for locking the chain to the sheave so as to cause the lifting-power to be exerted in a line with the axis of the sheave, substantially as described.

In testimony whereof I have affixed my signature in presence of two witnesses.

JOHN G. SPEIDEL.

Witnesses:
WM. G. NEUFFER,
J. F. MCDERMOTT.