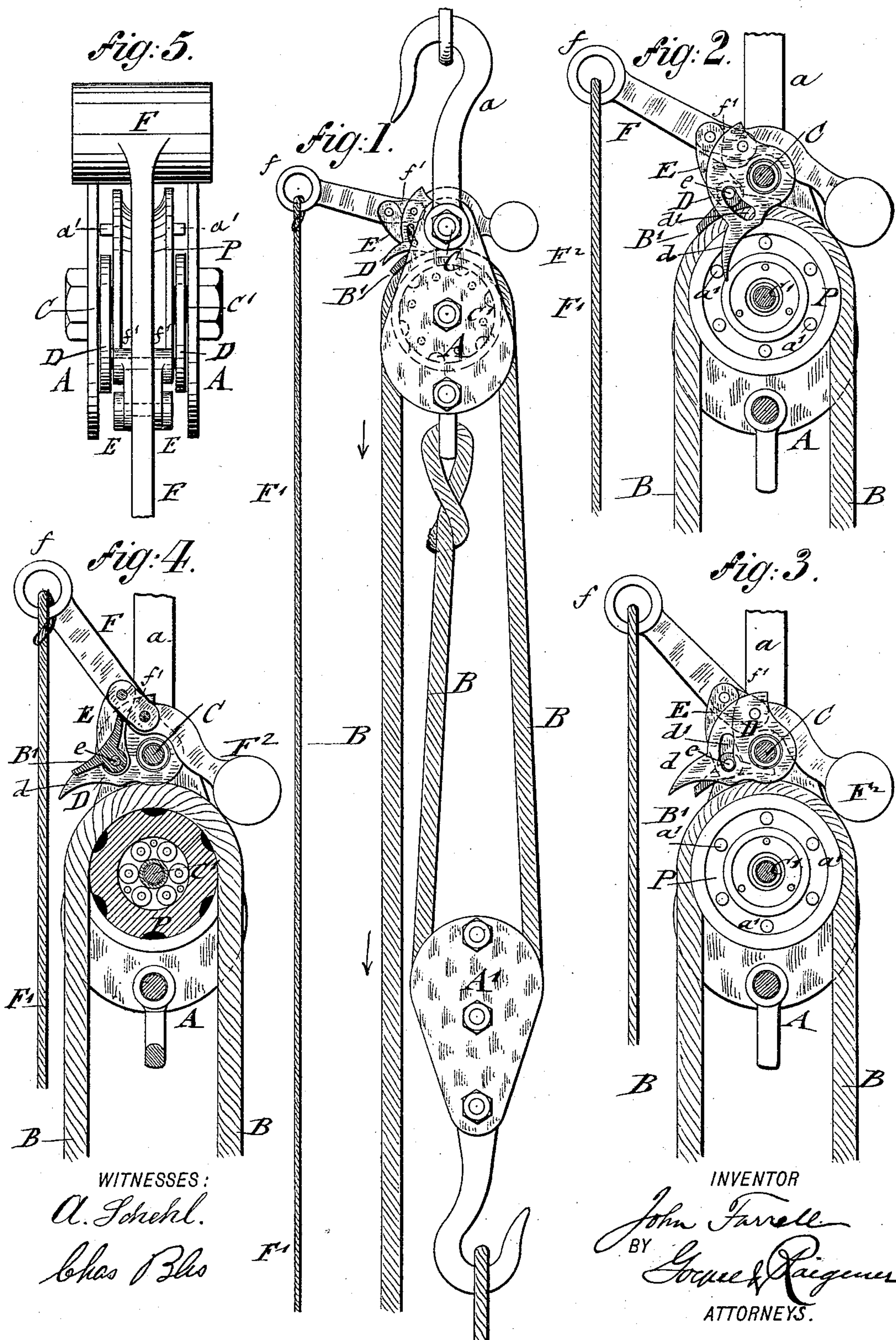


(No Model.)

J. FARRELL.
HOISTING TACKLE.

No. 471,308.

Patented Mar. 22, 1892.



UNITED STATES PATENT OFFICE.

JOHN FARRELL, OF HUNTSVILLE, NEW JERSEY.

HOISTING-TACKLE.

SPECIFICATION forming part of Letters Patent No. 471,308, dated March 22, 1892.

Application filed November 18, 1891. Serial No. 412,273. (No model.)

To all whom it may concern:

Be it known that I, JOHN FARRELL, a citizen of the United States, and a resident of Huntsville, in the county of Sussex and State of New Jersey, have invented certain new and useful Improvements in Hoisting-Tackles, of which the following is a specification.

This invention relates to an improved hoisting-tackle of that class in which the load is readily operated and suspended in position at any point where it may be desired to stop the load for removing the same; and the invention consists of a hoisting-tackle the pulley of which is locked by a pawl-and-ratchet mechanism, the pawls of which are pivoted to a cross-bolt of the pulley-block and to a weighted brake-lever arranged above the pulley. The brake-lever is also pivoted to the upper ends of links, the lower ends of which are connected by a cross-pin in arc-shaped slots of the pawls. To the cross-pin of the pivot-links is hung a brake-shoe, that is firmly pressed against the hoisting-rope by the action of the brake-lever and the pawl-and-ratchet mechanism whenever the load is to be stopped, in which case the pawls engage the ratchet devices on the pulley, so that the brake action of the shoe on the hoisting-rope is increased according to the increase of strain on the hoisting-rope. On releasing the pawls by a pull on the hoisting-rope and lowering the brake-lever the former is free to move so as to lower the load. By tilting the shoe on the cross-pin of the pivot-links in an upward position away from the cord the brake action of the same is entirely discontinued, so that the tackle can be operated without any brake action.

In the accompanying drawings, Figure 1 represents a side elevation of my improved hoisting-tackle, showing the same in position for lowering the load. Fig. 2 is a sectional side elevation of the same with one side plate of the pulley-block removed and showing the brake-shoe in position for locking the hoisting-cord. Figs. 3 and 4 are respectively a sectional side elevation and a vertical longitudinal section through the center of the pulley and its brake mechanism, showing the parts, respectively, in position before and after the brake-shoe is placed into tilted position for discontinuing the action of the brake device;

and Fig. 5 is a top view of the pulley-block and brake device of the hoisting-tackle, showing the same on a larger scale.

Similar letters of reference indicate corresponding parts in all the figures.

Referring to the drawings, A represents the upper pulley-block, A' the lower pulley-block, and B the hoisting-rope, of my improved hoisting-tackle. The hoisting-rope B is attached to the lower end of the upper pulley-block, passed over the pulley of the lower block, then over the pulley P of the upper block, and then in downward direction to the person operating the hoisting-tackle. The upper pulley-block A is suspended by a strong hook *a* from a suitable point of support, while the load is applied to the hook of the lower pulley-block in the usual manner. The pulley P of the upper pulley-block A is applied by anti-friction rollers to the center-bolt or shaft C' of the same, so that the friction of the same with the cross bolt or shaft is reduced as much as possible. The pulley P is provided in circumference with equidistant depressions *p*, as shown in Fig. 4, which serve for the purpose of increasing the friction with the hoisting-rope.

To the upper cross-bolt C of the pulley-block A are pivoted two pawls D, which engage by their lower pointed ends *d* laterally-projecting pins *a'* of the pulley P whenever the pawls are moved in downward direction. The pawls D are provided above the pointed lower ends with arc-shaped slots *d'* and pivoted at their upper ends to a brake-lever F. The slots *d'* are engaged by a cross-pin *e*, that connects the lower ends of two pivot-links E, the upper ends of which are also pivoted to the brake-lever F in front of the pivots of the pawls D, said brake-lever being provided at both sides with raised portions *f'*, which are cast integral with the lever, and which serve to thicken the same at the points of connection with the pivots of the pawls D and links E at its front end, with an eye *f* for attaching the trip-cord F', and at its opposite or rear end with a weight F², by which the brake-lever is dropped when the tension of the trip-cord on its front end is relaxed.

To the cross-pin *e* at the lower ends of the pivot-links E is pivoted a curved brake-shoe B', which serves to exert a brake action on

the hoisting-rope whenever the load is desired to be stopped. The brake-shoe B' has a smooth surface, so as to permit of the lowering of the hoisting-rope without exerting any chafing action on the same.

The brake mechanism is operated by pulling the trip-cord F' of the brake-lever F in downward direction, by which the brake-shoe is applied to the hoisting-rope by the action of the pivot-links E and the pawl-and-ratchet mechanism as the laterally-projecting pins of the pulley P engage the lower ends of the pawls D and cause them to move by their slots along the cross-pin e, so that the shoe B' is firmly pressed in the hoisting-rope B by the motion of the pulley in a direction opposite to the parts. By the pressure of the projecting pins a' on the lower ends of the pawls the brake-shoe is tightly pressed against the hoisting-rope and held in this position by the locking action which the ratchet-pins exert on the pawls D. The greater the tension of the load on the hoisting-rope the greater will be the pressure exerted by the pins on the pawls, by the pawls on the brake-shoe, and by the latter on the hoisting-rope, which is assisted by the depressions in the pulley, so that the latter is rigidly held in position, whereby the load is sustained at any desired point.

Whenever it is desired to discontinue the brake action on the brake-shoe for lowering the load, the hoisting-rope is first pulled down by one hand in the direction of the arrows shown in Fig. 1, by which the pawls are lifted out of engagement with the ratchet-pins in the pulley. The trip-rope B is then pulled by the other hand, and thereby the brake-shoe applied with some friction to the hoisting-rope, in which position the brake-lever F raises the pawls and prevents them from engaging the ratchet-pins. This motion of the pawls is permitted by the arc-shaped slots d' along the cross-pins of the brake-shoe. The hoisting-rope is then released and the descent of the load controlled wholly by the trip-rope. The hoisting-rope is thereby enabled to move under the brake-shoe, so as to lower the load to any required speed.

In case it should be desired to operate the hoisting-tackle without any brake action the brake-shoe is tilted on the cross-pin e of the pivot-links E from the position shown in Fig. 3 to the upwardly-inclined position shown in Fig. 4 until it is arrested by the brake-lever. This is readily accomplished by taking hold of the front end of the shoe and pressing it in upward direction, so that the rear end presses on the hoisting-rope. The upward pressure on the front end of the shoe compresses the rope and causes the parts to yield sufficiently to permit the tilting of the brake-shoe. In this position of the brake-shoe it is removed to such a distance from the hoisting-rope so as not to touch the same, its action being suspended as long as the brake-shoe remains in its upwardly-inclined position.

When it is desired to use the brake device again, the brake-shoe is turned in downward direction into the position shown in Fig. 3, in which position it is readily applied at any time to the hoisting-rope, so as to stop the same while the load is lowered, by pulling the rope and trip-cord in the manner before described, so that the pawls are moved out of engagement with the ratchet-pins of the pulley P and the brake-shoe pressed on the hoisting-rope, as shown in Fig. 1.

It is obvious that in place of the ratchet-pins on the pulley P ratchet-teeth may be used or any other devices by which the locking action is produced on the pulley by the pawls D.

The advantages of my improved hoisting device are, first, that a very effective brake action of the shoe is produced in conjunction with the locking action of the pawls on the ratchet devices of the pulley; secondly, that the load in being lowered can be wholly controlled by the trip-cord being pulled in a downward direction, which is accomplished by one hand merely, which is an important feature, as heretofore hoisting-tackles of this class had to be lowered by the use of both hands and the joint action of the trip-cord and hoisting-rope; thirdly, that owing to the smooth surface of the brake-shoe no injurious chafing action is produced on the hoisting-rope, while still a reliable locking of the rope is obtained by the pressure of the brake-shoe and the friction of the depressions of the pulley on the hoisting-rope, and, fourthly, that the action of the brake device can be entirely suspended, if desired.

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

1. The combination, with a pulley-block and hoisting-rope, of a pulley, a pawl-and-ratchet mechanism for locking or releasing said pulley when the rope is moved in one or the opposite direction, a weighted brake-lever pivoted to the pawls of said ratchet mechanism, a brake-shoe connected by pivot-links to the brake-lever, and a trip-rope attached to the brake-lever, substantially as set forth.

2. The combination, with a pulley-block and hoisting-rope, of a pulley having ratchet-pins, pawls adapted to engage said pins, a weighted brake-lever pivoted to said pawls, a brake-shoe connected by pivot-links with the brake-lever, and a trip-rope attached to the brake-lever, substantially as set forth.

3. The combination, with a pulley-block and hoisting-rope, of a pulley provided with ratchet-pins, pawls adapted to engage said pins, a weighted brake-lever pivoted to the upper ends of said pawls, a brake-shoe connected by pivot-links with the brake-lever, means for guiding the pawls on the cross-pin of the brake-shoe, and a trip-rope applied to the upper end of the brake-lever, substantially as set forth.

4. The combination, with a pulley-block and its hoisting-rope, of a pulley having ratchet-pins and depressions in its circumference,

pawls adapted to engage said ratchet-pins, a weighted brake-lever pivoted to said pawls, having a smooth surface, pivot-links connecting the brake-lever with the brake-shoe, and
5 a trip-rope attached to the brake-lever, substantially as set forth.

10 5. The combination, with a pulley-block and hoisting-rope, of a pulley having laterally-projecting ratchet-pins, pawls pivoted to a cross-bolt of the pulley-block and adapted to engage or release said pins, a weighted brake-lever pivoted to said pawls, links pivoted to the brake-lever and having a cross-pin at

their lower ends, said cross-pin extending into arc-shaped slots of the pawls, a brake-shoe 15 - pivoted to said cross-pin, and a trip-rope attached to the brake-lever, substantially as set forth.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

JOHN FARRELL.

Witnesses:

PAUL GOEPEL,

CHARLES SCHROEDER.