(No Model.)

# E. F. HARTSHORN.

## PULLEY.

No. 590,759. Patented Sept. 28, 1897.

Fig. 1

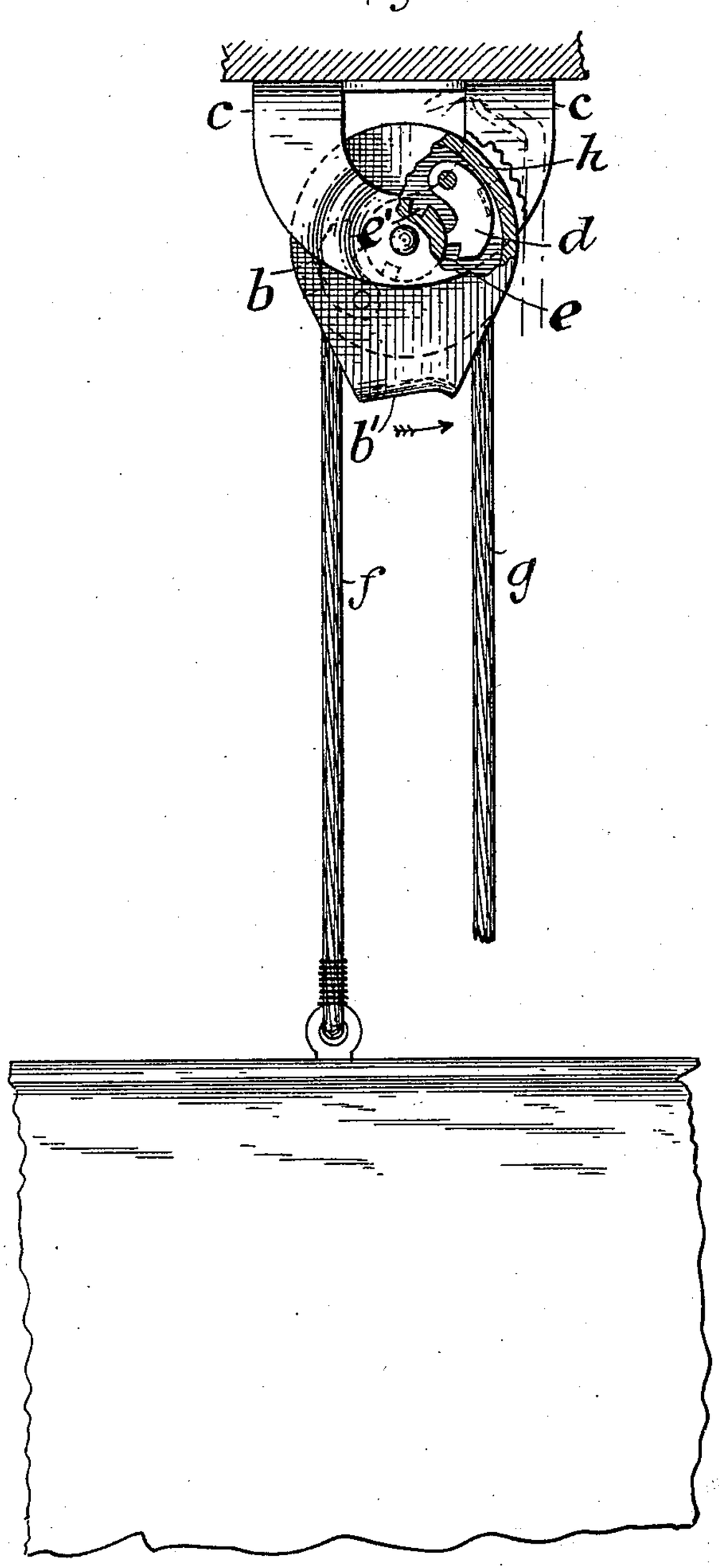



Fig. 2

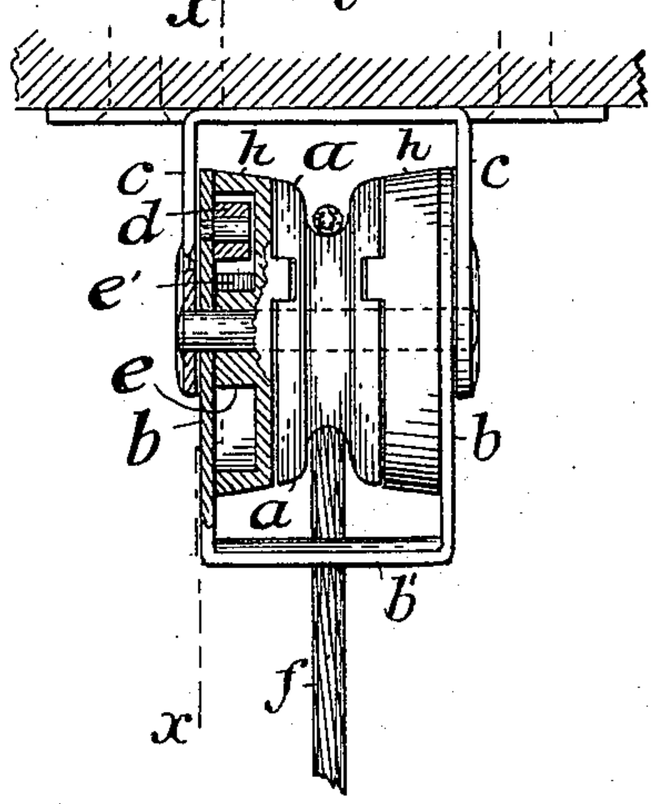
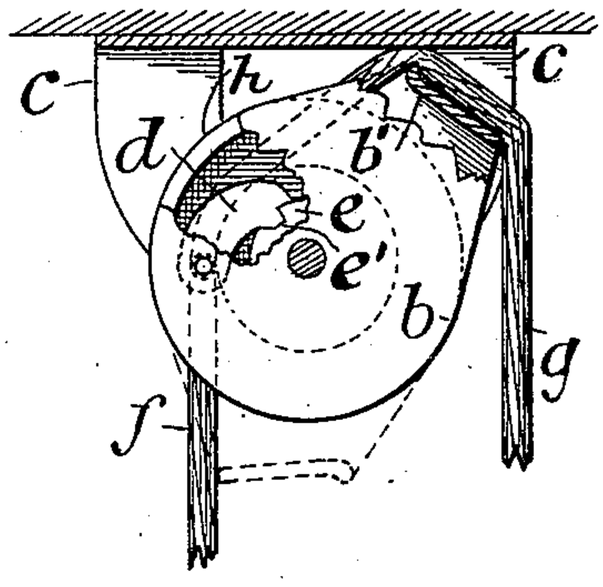



Fig. 2

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# UNITED STATES PATENT OFFICE.

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## PULLEY.

SPECIFICATION forming part of Letters Patent No. 590,759, dated September 28, 1897.

Application filed May 8, 1897. Serial No. 635,635. (No model.)

*To all whom it may concern:*

Be it known that I, EDMUND F. HARTSHORN, a citizen of the United States, and a resident of Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Pulleys, of which the following is a specification.

My invention relates to those pulleys known as "grip-pulleys," in which the cord passing through the pulley is gripped and held at whatever point desired and prevented from running over the pulley-wheel; and my improvement consists in a novel construction of the pulley by which it is rendered easy and effectual in operation.

This improvement is especially designed for use with shade-roller fixtures having a spring-roller placed at the bottom of the window-casing, and when the end of the shade is pulled upward it is held at the elevation desired.

In the accompanying drawings, illustrating my improvement, Figure 1 is a side view of the pulley in position, showing the cord attached to a window-shade mounted on a spring-roller. Fig. 2 is a front view of the pulley, partly in section; and Fig. 3 is a view of the pulley, showing the position of the parts when the cord is gripped.

The pulley-wheel *a*, over which the cord runs, is journaled and revolves in the fixed support *c*, by which the pulley is secured in position. Mounted on the same bearings in the support *c* is a swinging frame *b*, which incloses the wheel on both sides and has a narrow bottom or cross piece *b'*. In the normal position of the pulley, in which the cord is not gripped but is free to run over the wheel in either direction, this bottom piece hangs down between the two ends of the cord, as shown in Fig. 1. The wheel and frame *b* are free to turn independently of each other except as stated below. Mounted on the inner face of the frame *b* above its bearings is a pawl *d*, the toe or free end of which is arranged and adapted to drop down and engage with a notch *e'* on the hub *e* of the wheel. When this engagement of the pawl and hub is effected, as the pawl is on the frame and the hub on the wheel the frame and wheel will be locked together, and the continued revolution of the wheel will carry with it the frame and swing the bottom piece *b'* in the direction of the arrow. The length of the frame is such that when the bottom piece *b'* is swung upward it strikes against the plate of the support *c*, as shown in Fig. 3, and the further revolution of the frame and consequently of the wheel is stopped. To release the pawl from the hub, the wheel is revolved slightly in the opposite direction, when the toe of the pawl is raised from the notch and the disengagement of the frame and wheel effected.

The form and construction of the toe of the pawl with respect to that of the notch are such that when the wheel is revolved rapidly the pawl and notch do not engage with each other, but the pawl passes over the notch. The wheel is thus free to revolve without engagement with the frame *b* so long as it is revolved rapidly, but the moment its speed is checked and it is made to revolve slowly the pawl at once drops down into and engages with the notch on the hub and the wheel and frame are locked and move together and the frame is turned until the bottom piece *b'* is brought into contact with the base-plate of the support *c*.

The operation of the pulley is as follows: The end *f* of the cord passing through the pulley is attached to the shade or other object which it is desired to raise and hold. By pulling on the opposite end *g* of the cord the shade is raised to any desired point. If the end *g* of the cord is released, so as to permit the shade to run down or wind up rapidly on the roller under the action of the spring in the latter, the wheel is revolved so quickly that the pawl does not engage with the hub and the frame *b* remains stationary with the bottom piece *b'* down, as in Fig. 1. The shade may thus be raised and lowered freely so long as the motion is a rapid one, but the moment the downward motion of the shade is checked by the end *g* of the cord and hence the wheel caused to revolve slowly the pawl on the frame *b* engages with the hub on the wheel, locking the two together, and the continued revolution of the wheel swings the frame around until the bottom piece *b'* is brought in contact with the plate of the support *c*.

The cord is now, as shown in Fig. 3, tightly jammed between the edge of the bottom piece on the frame and the plate of the support, and the tension of the cord under the action of the spring in the roller or of the weight of the object held causes the bottom piece to press firmly against the plate, so that the cord is securely gripped and held, thus holding the shade or other object up at any desired position. The cord is thus gripped by the pressure of the bottom piece of the frame *b* against the plate of the support or against the window-frame, and, as will be evident, the greater the force of the spring in the roller tending to wind up the shade or of the weight of the object to be supported the firmer the hold on the cord and the grip of the pulley.

To release the grip of the pulley and free the cord, it is only necessary to pull on the end *g* of the cord, when the frame *b* is turned back toward its normal position, allowing the cord to run over the wheel, and the wheel revolved sufficiently to raise the pawl from its engagement with the notch on the hub, when the frame is disconnected from the wheel and the cord is free to run through the pulley at will.

In the construction shown in the drawings the pawl *d* and hub *e* are inclosed in a frame *h*, attached to the wheel *a;* but I do not wish to confine myself to this feature, or to the particular construction here shown, as the construction may vary without affecting the principle of my improvement.

What I claim is—

1. In a grip-pulley, in combination, a wheel journaled in a fixed support; a movable frame, provided with a cross-piece arranged and adapted to grip the cord when moved with the wheel; and a pawl mounted on the frame in position to engage with the wheel, whereby the wheel and frame are locked and move together, the arrangement of the pawl and wheel being such that they are brought into engagement by a slow motion, and held out of engagement by a rapid motion of the wheel, substantially as described.

2. In a grip-pulley, in combination, a wheel journaled in a fixed support, a frame journaled in the support and provided with a cross-piece arranged and adapted to grip the cord against the support when turning with the wheel; and a pawl mounted on the frame in position to engage with the wheel, whereby the frame and wheel are locked and move together, the arrangement of the pawl and wheel being such that they are brought into engagement by a slow motion, and held out of engagement by a rapid motion of the wheel, substantially as described.

3. In a grip-pulley, in combination, a fixed support holding the wheel, a wheel journaled therein, a frame journaled in the casing so as to turn independent of the wheel and provided with a cross-piece arranged and adapted to press and confine the cord against the top of the casing; and a pawl mounted on the frame in position to engage with the wheel, whereby the frame and wheel are locked and move together, the arrangement of the pawl and wheel being such that they are brought into engagement by a slow motion, and held out of engagement by a rapid motion of the wheel, substantially as described.

4. In a grip-pulley, in combination, the support *c;* wheel *a* journaled therein; frame *b* journaled in the support *c*, and having the cross-piece *b'*; pawl *d* mounted on the frame, and notched hub *e* secured to the wheel *a*, the pawl being arranged to engage with the notched hub under a slow revolution of the wheel, whereby the frame and wheel are locked and turn together to grip the cord; or to be held out of engagement with the hub by a rapid revolution of the wheel, substantially as described.

Signed at Newark, in the county of Essex and State of New Jersey, this 1st day of May, A. D. 1897.

EDMUND F. HARTSHORN.

Witnesses:
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F. E. HEATH.