(No Model.)

E. F. HARTSHORN.

PULLEY.

No. 590,758. Patented Sept. 28, 1897.

Fig. 1

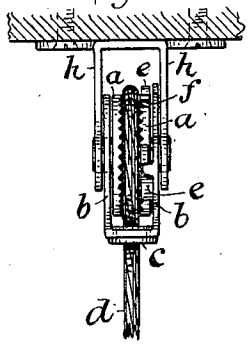


Fig. 2

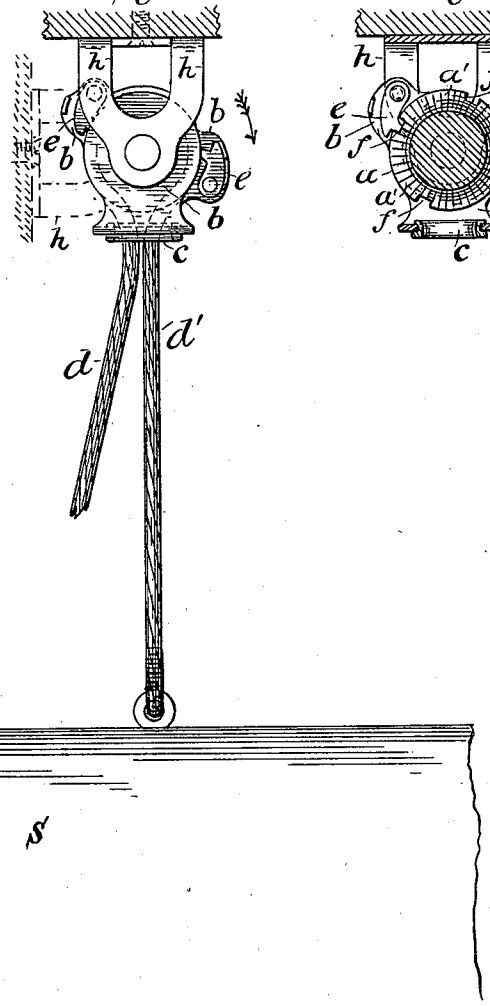
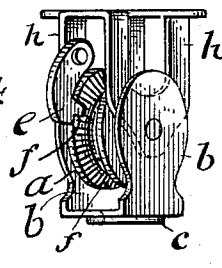


Fig. 3

Fig 4



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UNITED STATES PATENT OFFICE.

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PULLEY.

SPECIFICATION forming part of Letters Patent No. 590,758, dated September 28, 1897.

Application filed March 17, 1897. Serial No. 627,916. (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 is an improvement in that class of pulleys known as "grip-pulleys," in which the cord running over the wheel can be gripped and held whenever desired and which are used to raise objects and hold them suspended at any elevation.

My improvement is especially designed for use with shade-roller fixtures having the spring shade-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 an edge view of the pulley. Fig. 2 is a front view of the pulley with the shade attached to the cord and showing in dotted lines the pulley secured in another position. Fig. 3 is a side sectional view through the center of the pulley-wheel, and Fig. 4 is a modification.

In my improvement the pulley-wheel *a* is inclosed in a casing or frame *b*, within which the wheel is journaled and turns. In the bottom of this casing is a hole or opening *c*, through which both ends of the cord *d d'* pass and by which the cord is made to closely hug the wheel, whereby the cord is prevented from slipping on the wheel when the latter is caught and held by the pawl. To assist in holding the cord and preventing it slipping, the wheel is formed with a deep V-shaped channel *a'*, which is preferably serrated, as shown in Figs. 1 and 3. On one side of the frame *b* and immediately above the rim or periphery of the wheel *a* is pivoted a pawl *e*. As shown in the drawings, this pawl is attached to the frame slightly above the top of the wheel, so that its toe or free end will fall on and rest against the rim of the latter, and in this rim against which the pawl rests are a series of notches *f*, so constructed as to receive and engage with the toe of the pawl. When the pawl is in engagement with one of these notches, the wheel is held from turning in the direction indicated by the arrow in the drawings or in the direction to lower the shade. It therefore follows that as the cord cannot slip over the pulley-wheel and the wheel cannot turn in the necessary direction the end *d'* of the cord is gripped by the pulley and the shade or other article is held suspended. While the wheel is thus held from turning in the direction of the arrow by the engagement of the pawl and notch, it is free to revolve in the opposite direction, and hence to release the wheel from engagement with the pawl it is only necessary to turn the wheel slightly in the latter direction by pulling the end *d* of the cord, when the toe of the pawl is raised from the notch. The form and construction of the toe of the pawl with respect to the notch are such that when the wheel is revolved rapidly in the direction of the arrow the pawl and notch do not engage with each other, but the pawl passes over the notch. The wheel is thus free to revolve in this direction 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 engages with the notch and the further revolution of the wheel is stopped. The cord therefore can be freely drawn through the pulley in either direction without hindrance if it is drawn quickly, but as soon as the movement of the end *d'* of the cord is retarded the cord is gripped and held by the pulley and its further passage in this direction prevented. As will thus be seen, the shade may be run down or wound up or the other article attached to the cord lowered by causing the cord to move rapidly over the pulley-wheel to any point desired, when by checking the revolution of the wheel by pulling on the end *d* of the cord the other end *d'* of the cord is at once gripped by the pulley and the shade or other article held stationary.

In the construction shown in the drawings the frame *b* is journaled in the casing *h*, which is attached to the window-frame or elsewhere, so as to turn in the latter independently of the pulley-wheel. This adaptability of the frame *b* to turn in the fixed frame *h* permits the latter to be attached to the window-casing or elsewhere in any position and have the opening *c* through which the cords pass al-

ways in line with the cords, as will be understood from the full and dotted lines in Fig. 2. The pulley is therefore adapted for use in any connection or position. The movement of the frame *b* furthermore permits a more perfect operation of the pulley, as it allows the frame and wheel to move when the wheel is caught by the pawl and more readily adapt itself to the movement of the shade or other object raised.

For convenience two pawls are mounted on the frame *b* in such positions, as shown in the drawings, that one of the pawls will always be above the wheel and in position to engage with the notches on the latter, no matter in what position the wheel is placed.

The modified construction shown in Fig. 4 has the pawl mounted on the fixed frame *h* in position to engage with the notch on the wheel. This construction, while it will not permit the use of the pulley in as many positions as the construction shown in the other figures, will yet allow its use wherever the pawl is above the wheel *a*.

With my improvement the gripping and holding of the cord is always effectual, the operation of the pulley is simple, and the pulley will operate equally well in any position.

I do not wish to confine myself to the particular constructions herein shown and described, as the construction may vary. The frame *b* may be attached directly to the window-frame and be fixed and immovable.

What I claim is—

1. In a grip-pulley, in combination, a wheel adapted to grip and hold the cord; a frame inclosing the wheel and having an opening for the cord, whereby the cord is made to closely hug the periphery of the wheel; and a pawl mounted in position to engage with the wheel, 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 adapted to grip and hold the cord; a frame arranged to be attached in position, a second frame journaled in the fixed frame so as to turn therein, and inclosing the wheel and having an opening for the cord whereby the cord is made to closely hug the periphery of the wheel; and a pawl mounted in position to engage with the wheel, 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 wheel adapted to grip and hold the cord; a frame arranged to be attached in position; a second frame journaled in the fixed frame so as to turn therein, and inclosing the wheel and having an opening for the cord whereby the cord is made to closely hug the periphery of the wheel; and a pawl mounted on the movable frame in position to engage with the wheel, 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 wheel *a* adapted to grip and hold the cord, and provided with notches for engagement with the pawl; frame *h* arranged to be attached in position; frame *b* journaled in the frame *h*, and having the opening *c* for the cord whereby the cord is made to closely hug the periphery of the wheel; and the pawl *e* mounted on the frame *b* and arranged to engage with the notches on the wheel as set forth, substantially as described.

Signed at Newark, in the county of Essex and State of New Jersey, this 10th day of March, A. D. 1897.

EDMUND F. HARTSHORN.

Witnesses:
E. L. DURGIN,
F. E. HEATH.