

W. Rung,
Differential Pulley,
No. 68,794, Patented Sept. 10, 1867.

Fig: 1.

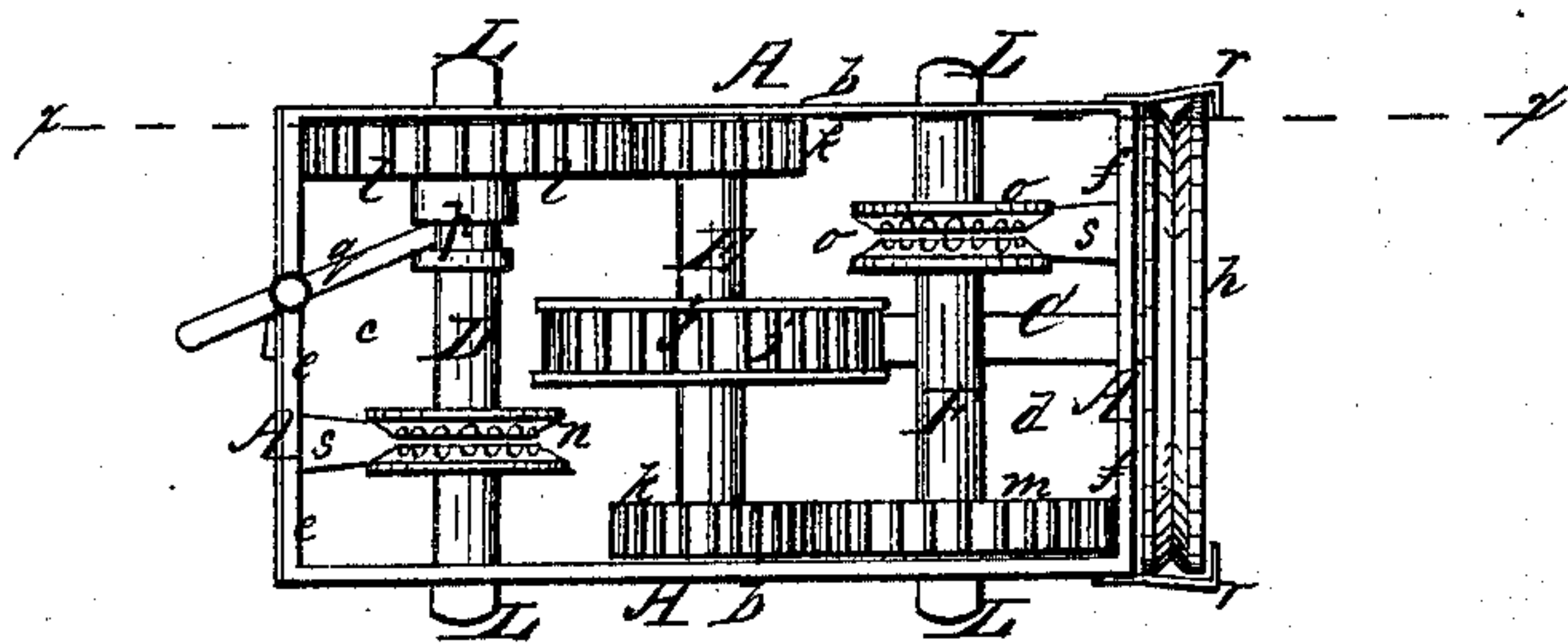
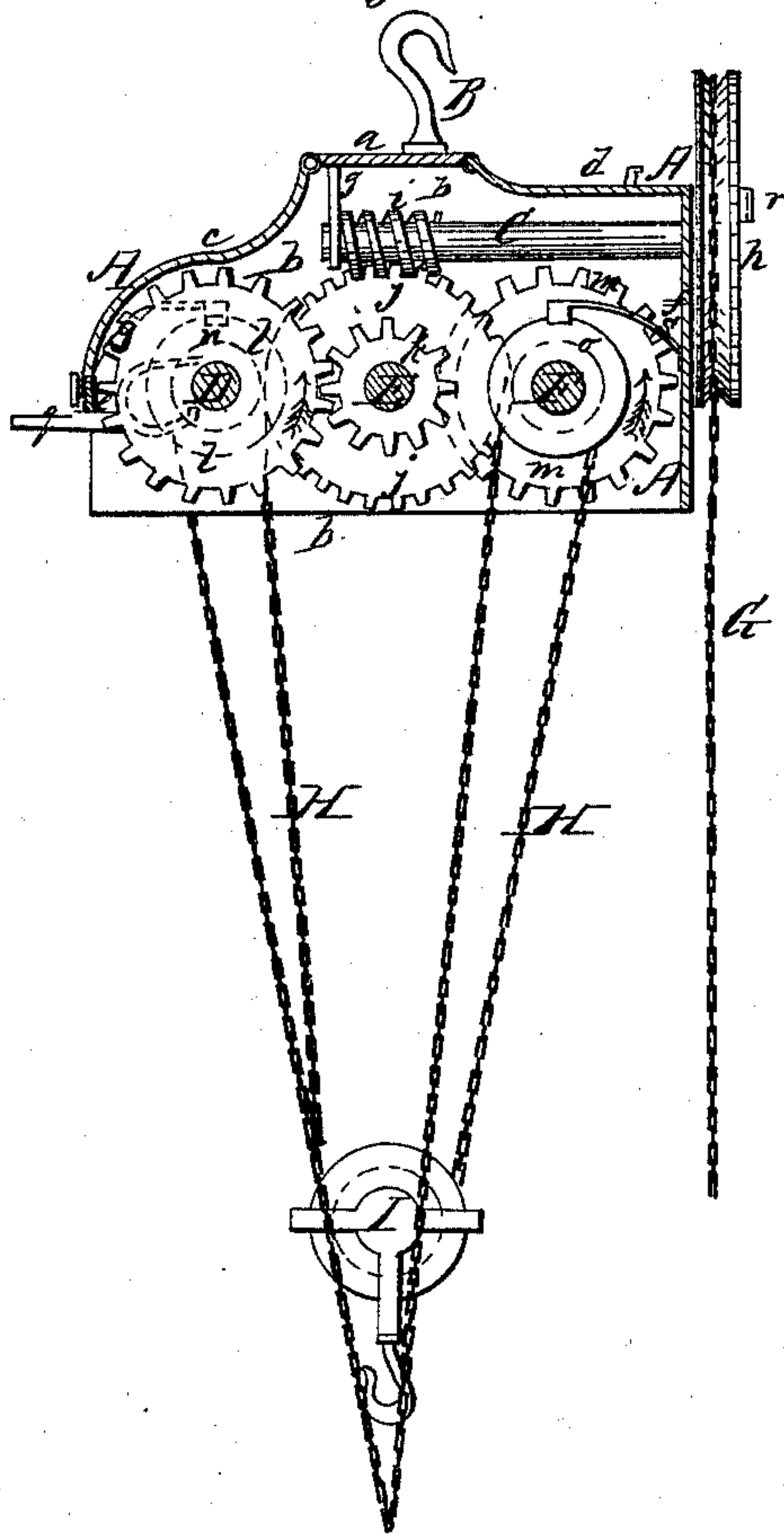


Fig: 2.



Witnesses.

Theo. Truiche
Wm. Truiche

Inventor.

Wm. Rung
Per. Rung
Attorney

United States Patent Office.

WILLIAM RUNG, OF NEW YORK, N. Y.

Letters Patent No. 68,794, dated September 10, 1867.

IMPROVEMENT IN HOISTING APPARATUS.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, WILLIAM RUNG, of the city, county, and State of New York, have invented a new and improved Hoisting Apparatus; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 represents an inverted plan view of my improved hoisting apparatus.

Figure 2 is a side view of the same partly in section, the plane of section being indicated by the line *xx*, fig. 1. Similar letters of reference indicate corresponding parts.

This invention relates to a hoisting apparatus in which by an endless chain motion is imparted to a shaft on which an endless screw is arranged which meshes into a worm-wheel that is mounted on another shaft. The latter is connected by differential gearing with two shafts, on which the drums over which the endless hoisting chain passes are mounted. One of the drum-shafts can be easily thrown out of gear for the purpose of lowering the hook pulley which slides in the lower part of the hoisting chain. The four shafts are hung in a casing which is suspended from a stationary frame, and which is provided with suitable lids for giving access to the shafts for lubricating and cleaning purposes. Provision is made that the hoisting chain cannot slip on or get off the drum.

A represents a case or box, made of sheet metal or other suitable material, open at the under side, and closed on top to keep the dust out. The central portion *a* of the cover is fixed between the side pieces *b b* of the case, while the ends *c* and *d* of the cover are hinged to the centre *a*, their swinging ends resting upon the end pieces *e* and *f* of the case, respectively. To the top of the stationary cover *a* is secured a swivel hook, B, by which the case can be suspended from a stationary frame or beam. C is a shaft, which has its bearings in the end piece *f*, and in a plate, *g*, which is suspended from the cover *a*. On its outer end is mounted a large pulley, *h*, while its inner end is provided with an endless screw, *i*, as is clearly shown in the drawing. D, E, and F are three horizontal shafts, which have their bearings in the side pieces *b b* of the case, and which are arranged on the same level with each other, as is clearly shown in fig. 2. The shaft E is in the centre between D and F, which are equally distant from it. A worm-wheel, *j*, is mounted on the shaft E, and meshes into the worm *i*. On each end of the shaft E is mounted a pinion, *k*, as is clearly shown in fig. 2. These pinions *k* mesh into gear-wheels *l* and *m* that are arranged on the shafts D and F, respectively. Motion is thus transmitted to the shafts D and F from the shaft C by means of an endless chain, G, which passes over the pulley *h*. The transmission is such that with little power applied to the shaft C, great power will be imparted to the shafts D and F, so that heavy weights can be elevated with the application of but a small amount of muscular power. H is an endless hoisting chain, which is laid over two pulleys *n* and *o*, which are mounted on the shafts D and F, respectively. This chain is so arranged that two loops hang down from the case A, in one of which the hook pulley I is arranged. The pulleys *n* and *o* have flanges which are notched or recessed to receive and hold the links of the chain H to prevent the same from slipping. By turning the shaft C from left to right, the shafts D and F will be revolved in the direction of the arrows shown in fig. 2, thereby drawing the ends of that loop in which the hook pulley is arranged up, and elevating the weight that may be suspended from the latter. The thread of the screw *i* is arranged so little inclined that when the parts are left unmoved the weight on the hook pulley will not be able to draw the loop of the chain in which it is arranged down again, the flanges of the screw *i* acting as effectual brakes to prevent the shaft E, and with it the shafts D and F, from turning. The pulley *h* is also like the pulleys *n* and *o*, to prevent the chain G from slipping. The gear-wheel *l* on the shaft D is made so as to slide on the shaft, and is connected with a clutch, *p*, and lever *q*, the latter being pivoted to the end strip *e*. By this means the wheel *l* can be thrown out of gear, whereby the shaft D is allowed to turn independent of the other shafts. Thus when the shaft D is thrown out of gear, the hook pulley can be easily and quickly lowered, by drawing it down, so that the chain H will be drawn over the pulley on D, its other side being held fixed on the shaft F. *r r* are L-shaped arms, which are secured to the case A, and are made to fit around the rim of the pulley *k* to prevent the chain from running out of the groove. The pulleys *n* and *o* are protected in a similar manner by arms *s s*. The peculiar mode of drawing the chain H over the pulleys *n* and *o*, so that both ends of the loop in which the hook pulley hangs, are drawn up at the same time, gives a greater

steadiness to the weight hoisted. L L are four (more or less) plates or lugs, projecting from the sides of the case A, and serve to support the latter when the same is not to be suspended. Bolts may be arranged through these plates L, whereby the device may be secured on a suitable bed of sufficient strength. This arrangement will be of special value for elevating very heavy weights.

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

1. So arranging the hoisting chain and the device for operating it, that two loops are suspended from the latter, in one of which the hook-pulley is arranged, the arms of this loop being laid over pulleys on two shafts D and F, which are both revolved with exactly equal velocity and in the same direction, as set forth.
2. The worm *i* and worm-wheel *j*, in combination with the shafts D, E, and F, and gear-wheels *k*, *l*, and *m*, all made and operating substantially as herein shown and described.
3. Providing the case A with folding lids *c* and *d*, substantially as and for the purpose herein shown and described.
4. The guards *r* and *s*, in combination with the grooved pulleys *h* and *n* *o*, respectively, for the purposes herein shown and described.
5. The projecting lugs L L, when arranged on the case A of a hoisting apparatus, substantially as and for the purposes herein shown and described.

WILLIAM RUNG.

Witnesses:

WM. F. McNAMARA,
ALEX. F. ROBERTS.