(No Model.)

# J. WALKER.

## STEP BOX FRAME FOR CABLE RAILWAYS.

No. 441,455. Patented Nov. 25, 1890.

Fig 1.

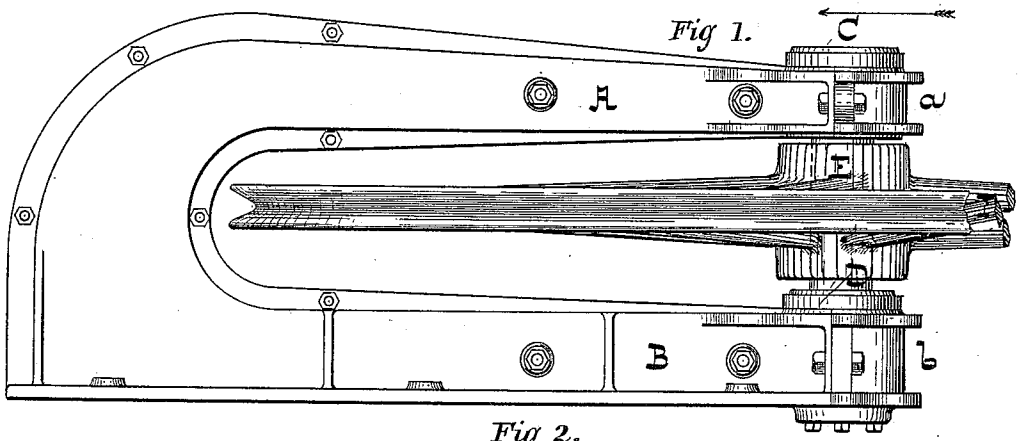



Fig 2.

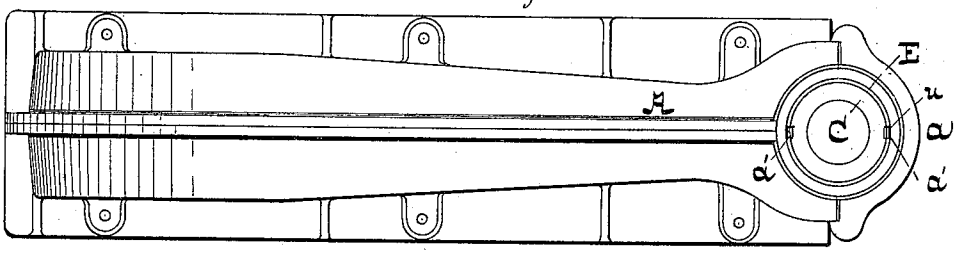



Fig 3.

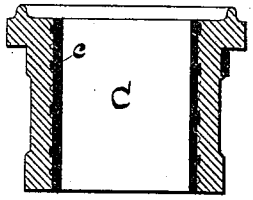



Fig 4.

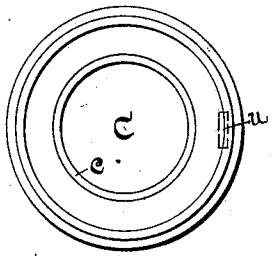



Fig 8.




Fig 9.

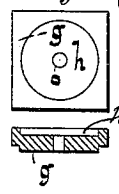



Fig 5.

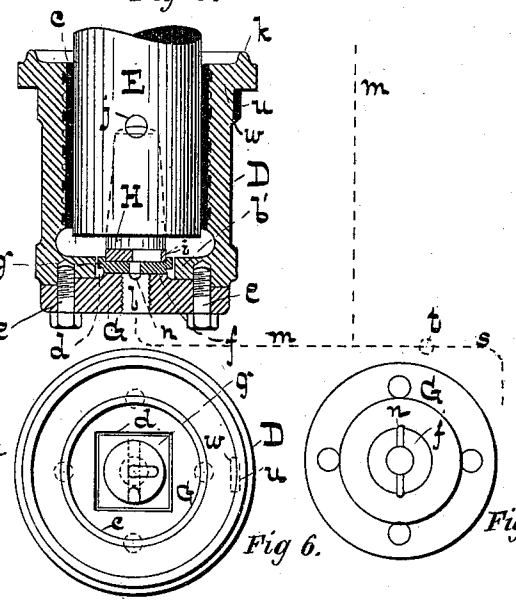



Fig 6.




Fig 7.




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# UNITED STATES PATENT OFFICE.

JOHN WALKER, OF CLEVELAND, OHIO.

## STEP-BOX FRAME FOR CABLE RAILWAYS.

SPECIFICATION forming part of Letters Patent No. 441,455, dated November 25, 1890.

Application filed March 12, 1890. Serial No. 343,648. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN WALKER, of the city of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain Improvements in Step-Box Frames for Cable Railways, of which the following is a specification.

The said invention relates, first, to improved means for supporting the sheave-spindle within the lower bearing-box and to a peculiar construction of the said supporting devices, whereby oil for lubricating purposes is conducted to the entire surface in contact with the toe in which the spindle terminates. The said invention relates, secondly, to a peculiar construction of the bearing-boxes for the sheave-spindle and the parts of the frame in which they are inclosed, whereby the said boxes when worn by the spindle may be reversed in position in the frame and a new wearing-surface presented, as will hereinafter fully appear.

In the further description of the said invention which follows reference is made to the accompanying drawings, forming a part hereof, in which—

Figure 1 is an exterior side elevation of the sheave-supporting frame, the spindle, and a portion of the sheave. Fig. 2 is a top view of Fig. 1 without the sheave. Fig. 3 is a central vertical section of the upper bearing-box, and Fig. 4 a top view of the same. Fig. 5 is a central vertical section of the lower bearing-box, in which is shown a portion of the spindle, and the supporting devices for the same. Fig. 6 is a top view of Fig. 5 without the spindle. Fig. 7 is a top view of a removable plate which forms a part of the lower bearing-box. Fig. 8 illustrates a top view and a central section of a disk on which the toe of the spindle bears, and Fig. 9 similar views of a step which holds and supports the button.

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

Referring to the drawings, A and B are respectively the upper and the lower limbs of the frame, which is a forked or bifurcated structure. The ends of the limbs are provided with caps *a* and *b* and bearing-boxes C and D, in which the sheave-spindle E revolves. A portion of the sheave is denoted by F. These bearing-boxes are cylindrical, and preferably made of iron with a Babbitt-metal lining *c*. The lower box D, which sustains the whole weight of the spindle and sheave, is provided with a bottom *b'*, having a rectangular hole *d* much smaller than the spindle centrally thereof, and over this hole is secured by means of bolts *e* a plate G with a slightly-elevated seat *f*, upon which is placed a step *g*. This step consists of a rectangular plate of tool-steel somewhat smaller than the hole *d*, having a circular lower face of about the same diameter as the seat *f* and a circular depression *h* in its upper face. In this depression is seated a circular anti-friction disk *i*, of phosphor-bronze, free to revolve within the depression *h*, and upon this disk rests the toe H, which consists of a tapering steel pin inserted in the lower end of the spindle E, as shown in Fig. 5.

The toe H may be removed from the spindle by driving a key or bar through a hole *j*, which extends transversely of the spindle.

Oil for lubrication may be introduced into the bearing-boxes from their upper ends, and to facilitate this operation and prevent loss of oil the boxes are provided with a raised circular bead *k*. This bead also admits of a film of oil being maintained on the top of the boxes; but the lower box, in view of its being under the sheave, is not as accessible for oiling as is the upper one. I therefore screw an oil-feed pipe into a hole *l* in the plate G and lead it to some convenient point somewhat elevated above the bearing-box. This pipe is represented by a dotted line marked *m*. Oil introduced into this pipe passes to under the step *g*, whence it escapes through a channel *n* in and extending across the face of the step to the space around it and thence to the interior of the box, in which it rises around the spindle. This body of oil in the bearing-box could not find its way to the rubbing-surfaces between the toe and disk to lubricate them without special means being provided for exposing the entire rubbing-surfaces to the oil. I therefore provide the step *g* with a central hole *o* and the disk *i* with a through-slot *p*, which begins at its center and terminates near its circumference, and in addition a notch *v*, which extends from the circumfer-

ence to a point slightly nearer the center of the disk than the outer end of the slot. With this arrangement oil passes up through the central hole *o* and communicates with the slot *p*, which becomes filled with oil. This oil lubricates the portion of the toe-piece face inclosed within the dotted line *r*, and the annular space around this line is lubricated by oil which enters the notch from the circumference of the disk, and the whole surface is therefore kept oiled.

When it is desired, the oil from the lower bearing-box can be drawn off through a branch *s* of the pipe *m*, which is fitted with a cock denoted by *t*.

The wear in bearing-boxes of cable sheave-frames of this class is always in the direction indicated by the arrow, the surface of the bearing within the cap being practically not touched by the spindle. In view of this fact I make the bearing-boxes reversible in position within the frame and provide each box with a key or feather *u*, which is held in a depression *w* therein. I further provide the frame proper and the cap with key-seats *a'*, into either one of which the key *u* will enter.

When the apparatus is first built and placed in operation, the journal-boxes are placed so as to bring the keys in, say, the frame proper, and after the Babbitt lining has become materially worn their position is reversed and the keys placed in the seats in the caps. With this change a new bearing-surface is presented to the spindle.

I claim as my invention—

1. In a step-box, the combination, with a fixed step having a depression and a perforation for the passage of a lubricant from its lower surface, of a revoluble disk seated in said depression, substantially as specified.

2. In a frame for the purpose described, the combination of a sheave-spindle and a support for the same, which consists of a centrally-perforated fixed step, a revoluble disk having a slot which reaches from its center to near the periphery, and a notch which extends from the periphery to a point somewhat nearer the center than the outer end of the slot, whereby oil introduced to the central hole in the step and to the circumference of the disk has access to the entire rubbing-surface of the spindle and disk, substantially as and for the purpose specified.

3. In a frame for the purpose described, the lower bearing-box for the sheave-spindle, having a bottom cap with a raised seat, which is centrally perforated and provided with a diametrically-situated channel, combined with a fixed step on the said raised seat, having a circular depression in its upper face and a revoluble disk situated in the said depression, substantially as and for the purpose specified.

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Witnesses:
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