(No Model.) 3 Sheets—Sheet 1.

S. BAXTER.

CAPSTAN FOR WORKING CHAIN CABLES.

No. 303,106. Patented Aug. 5, 1884.

Fig. 1.

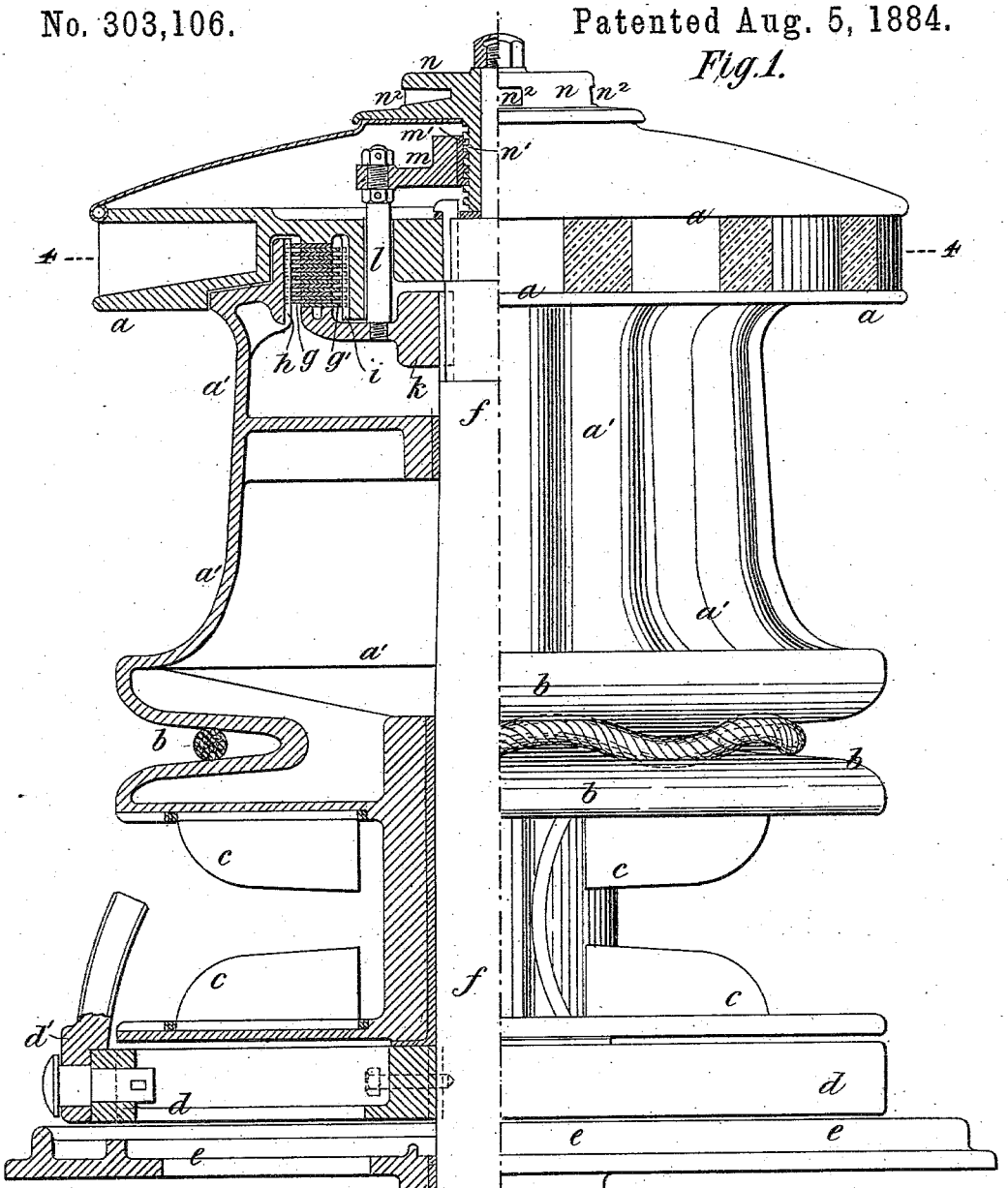

Fig. 4.

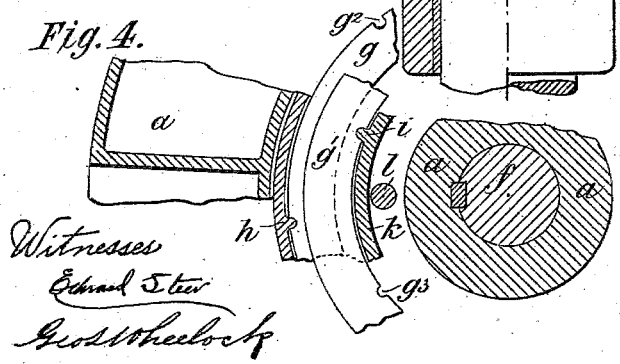

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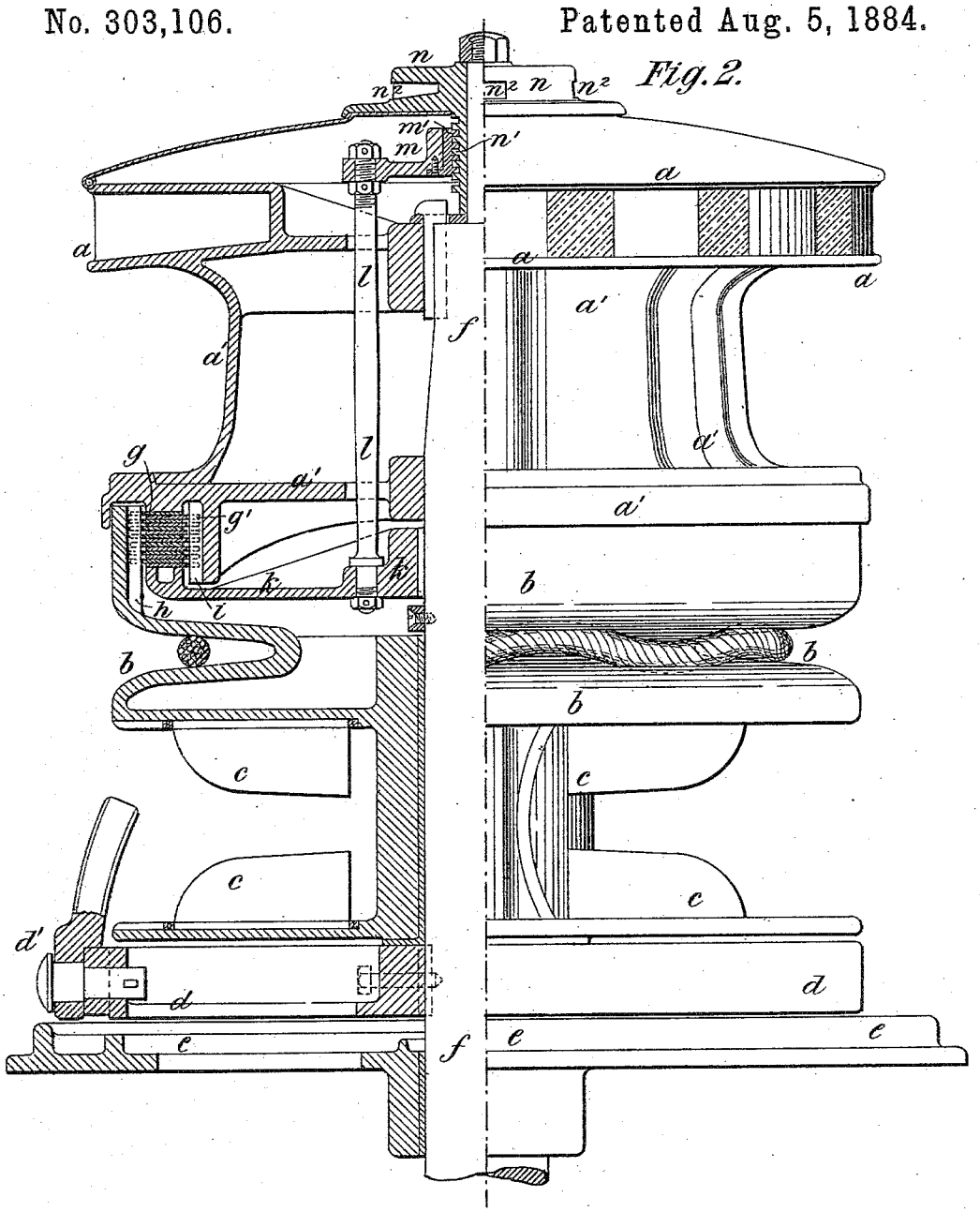
Fig. 2.



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(No Model.) 3 Sheets—Sheet 3.

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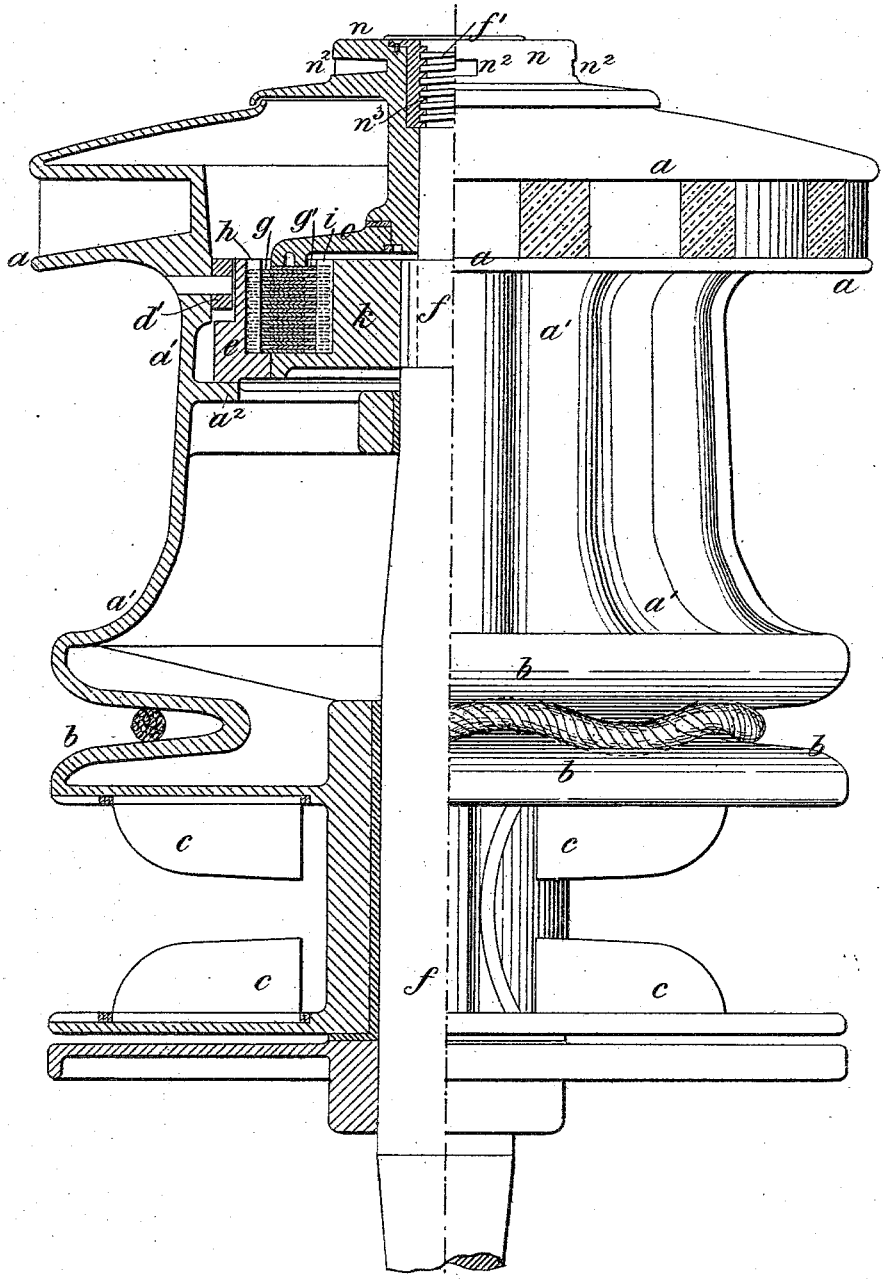
CAPSTAN FOR WORKING CHAIN CABLES.

No. 303,106. Patented Aug. 5, 1884.

Fig. 3.



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UNITED STATES PATENT OFFICE.

SAMUEL BAXTER, OF GREAT ST. HELEN'S, LONDON, ENGLAND.

CAPSTAN FOR WORKING CHAIN CABLES.

SPECIFICATION forming part of Letters Patent No. 303,106, dated August 5, 1884.

Application filed April 30, 1884. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL BAXTER, a subject of the Queen of Great Britain, residing at Great St. Helen's, in the city of London, England, (engineer,) have invented certain new and useful Improvements in Capstans for Working Chain Cables and Wire and other Ropes, of which the following is a specification.

My invention relates to an improvement in those windlasses or capstans in which friction-ring connections are employed to connect the barrel with the chain-wheel.

My invention is also an improvement on the windlass for which United States Letters Patent No. 264,924 were granted to me on the 26th September, 1882.

My improvements consist in the construction hereinafter described, and pointed out in the claims.

The object of these improvements is to facilitate the working of chain cables and wire and other ropes; to insure greater safety to the men while working them; to prevent the destructive effects of exceptional strains, and to dispense with the usual method of "fleeting" in the case of capstans, or the men walking backward to slacken back to relieve the strain.

It has hitherto been customary for capstans to be mounted upon spindles, and by means of capstan-bars inserted in the head the chain cables or ropes are hove in and held from running out by hinged pawls dropping as the capstan is revolved into spaces against stop-pieces in a pawl-rim, which is bolted to the deck or platform. Under these circumstances, in the event of a sudden strain being transmitted to the capstan while the same is being rotated, the men are frequently hurled round with the capstan-bars, while, when the capstan is at rest, a violent and sudden strain frequently results in destructive effects to the capstan. According to my present invention, I combine with the capstan at any suitable part a series of friction plates or disks, serving as a means of connection between some of the parts, and acted upon by suitable compression means in such manner as to enable some of the parts to slip in relation to others in the event of any sudden or excessive strain coming upon the same, thereby preventing injury to the men or to the capstan.

In order that my said invention may be clearly understood and readily carried into effect, I will proceed, aided by the accompanying drawings, fully to describe the same.

In the drawings, Figures 1, 2, and 3 represent three capstans constructed according to my invention, but representing three different modifications thereof. Each figure shows on the one half a vertical section, and on the other half a vertical elevation, of the capstan. Fig. 4 represents a horizontal section of parts drawn on the line 4 4 of Fig. 1.

In all the figures like parts are marked with similar letters of reference.

a is the bar-head.

a' is the capstan-body.

b is a waved wheel for working wire and other ropes.

c is a cable-holder for working chain cables.

d is the pawl-head.

d' are the pawls.

e is the pawl-rim, and *f* is the spindle.

g g' are two sets of annular frictional plates. The frictional plates *g* are formed each on its outer periphery with notches or recesses g^2, to fit corresponding tongues or ribs, *h*, formed on one or other part of the capstan apparatus, while the friction-plates *g'*, which are placed intermediate of the friction-plates *g*, are formed, each on its inner periphery, with notches or recesses g^3, to fit corresponding tongues or ribs, *i*, formed on another part of the capstan apparatus.

k is a carrier, upon which the friction-plates *g g'* are supported. In Figs. 1 and 2 the carrier *k* is keyed loosely upon the spindle *f* in such manner that it may move vertically free of the spindle, but is compelled to revolve with it, and such carrier *k* is connected by tension-rods *l*, which pass to the head of the capstan, where they are fitted to another carrier, *m*, which is formed with a female screw, *m'*, to fit a male screw, *n'*, formed on a head-piece, *n*, fitted on the upper end of the spindle *f*, and capable of being rotated thereon by means of bars inserted in the holes n^2, or in other suitable manner. In Fig. 3 the carrier *k* rests

on a shoulder of the spindle *f*, and is keyed rigidly in position thereon. The rods *l* and the carrier *m* are dispensed with, while the head-piece *n* is formed with a female screw, n^3, to fit a male screw, *f'*, formed on the spindle *f*, and is caused to bear more or less strongly upon a pressure-disk, *o*, resting upon the top of the series of friction-plates *g g'*. By the means above described, on rotating the head-piece *n* in one or the other direction the required pressure is transmitted to the friction-plates or removed therefrom, as may be required.

In Fig. 1 the bar-head *a* and pawl-head *d* are separate from the capstan, but are attached rigidly to the spindle *f*, while the capstan-body *a'*, waved wheel *b*, and cable-holder *c* are cast or otherwise rigidly fixed together, but are capable of revolving upon the spindle *f*, while the tongues or ribs *h* are cast on the capstan-body *a'*, and the tongues or ribs *i* are cast on the bar-head *a*, the pawl-rim *e* being fixed to the deck or platform. According to this arrangement motion is transmitted from the bar-head *a*, through the friction-plates *g g'*, to the capstan-body *a'*, waved wheel *b*, and cable-holder *c*, while the bar-head *a* and pawl-head *d* revolve with the spindle. By these means the destructive effects of exceptional violent strains are prevented, while greater safety is insured to the men working the capstan, as a frictional resistance is set up by means of the friction-plates *g g'* to the extent required to heave in; but on any violent strain coming unexpectedly upon the body *a'* of the capstan, or upon the waved wheel *b* or cable-holder *c*, a yielding will take place through the friction-plates *g g'*, and thereby modify the strain upon the pawls as they are held by the stops in the pawl-rim, and at the same time prevent the men being hurled round with the capstan-bars should the pawls be out of action or give way. The necessity for the men to walk backward to slacken back or relieve the strain is also avoided, as is also the usual method of "fleeting," as the chain or rope may be veered or slacked at will by a proper adjustment of pressure on the friction-plates *g g'*.

In the modification represented at Fig. 2 the bar-head *a* and capstan-body *a'* are cast or otherwise fixed rigidly together, and the waved wheel *b* and cable-holder *c* are also cast or otherwise fixed rigidly together. The bar-head *a*, capstan-body *a'*, and pawl-head *d* are keyed rigidly on the spindle *f;* but the waved wheel *b* and cable-holder *c* are capable of revolving thereon. The tongues or ribs *h* are cast on the waved wheel *b*, and the tongues or ribs *i* are cast on the capstan-body *a'*.

In the modification represented at Fig. 3 the bar-head *a*, capstan-body *a'*, waved wheel *b*, and cable-holder *c* are cast or otherwise fixed rigidly together, the pawl-head *d* is dispensed with, and the pawls *d'* are mounted upon spindles fitted in the upper part of the capstan-body *a'*, while the pawl-rim *e* is fitted in the upper part of the capstan-body *a'* and is supported on a ledge, a^2. The tongues or ribs *h* are cast on the pawl-rim *e*, and the tongues or ribs *i* are cast on the carrier *k*. In this modification the spindle *f* is a fixture; or it may be provided with gearing, in which latter case the capstan may be driven either by such gearing or by the capstan-bars.

Having thus described the nature of my said invention, and the mode in which I carry the same into effect, I would have it understood that what I claim, is—

1. In a capstan worked by capstan-bars, the combination of the bar-head *a*, body *a'*, spindle *f*, friction-plates *g g'*, carrier *k*, to support the friction-plates, and tongues or ribs, as set forth.

2. The combination of bar-head *a*, capstan-body *a'*, waved wheel *b*, cable-holder *c*, pawl-head *d*, pawl-rim *e*, spindle *f*, friction-plates *g g'*, carrier *k*, and tongues or ribs *h i*, substantially as herein shown and described.

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