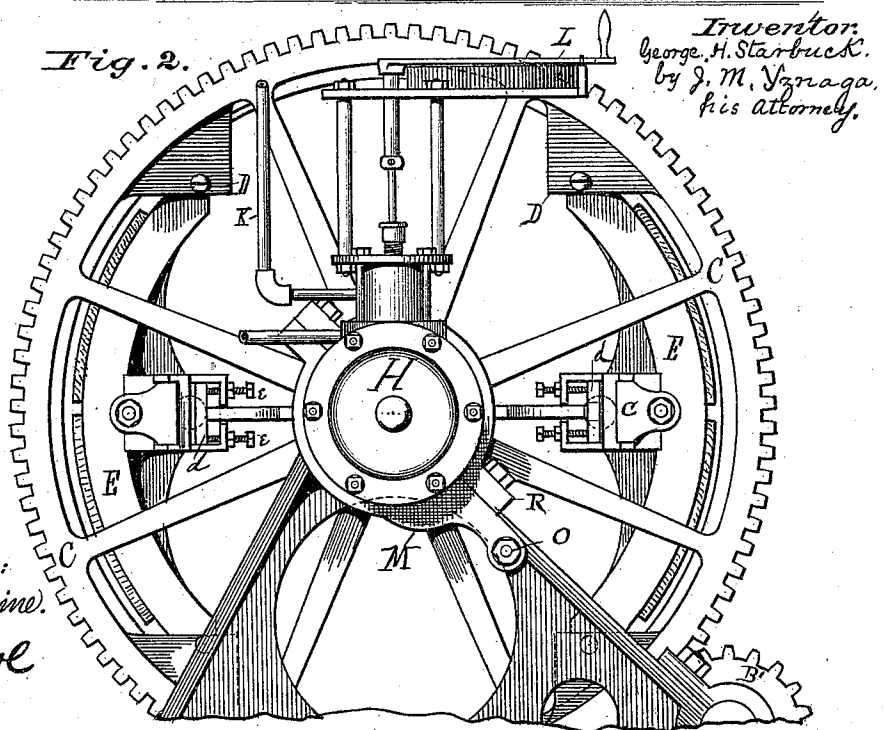
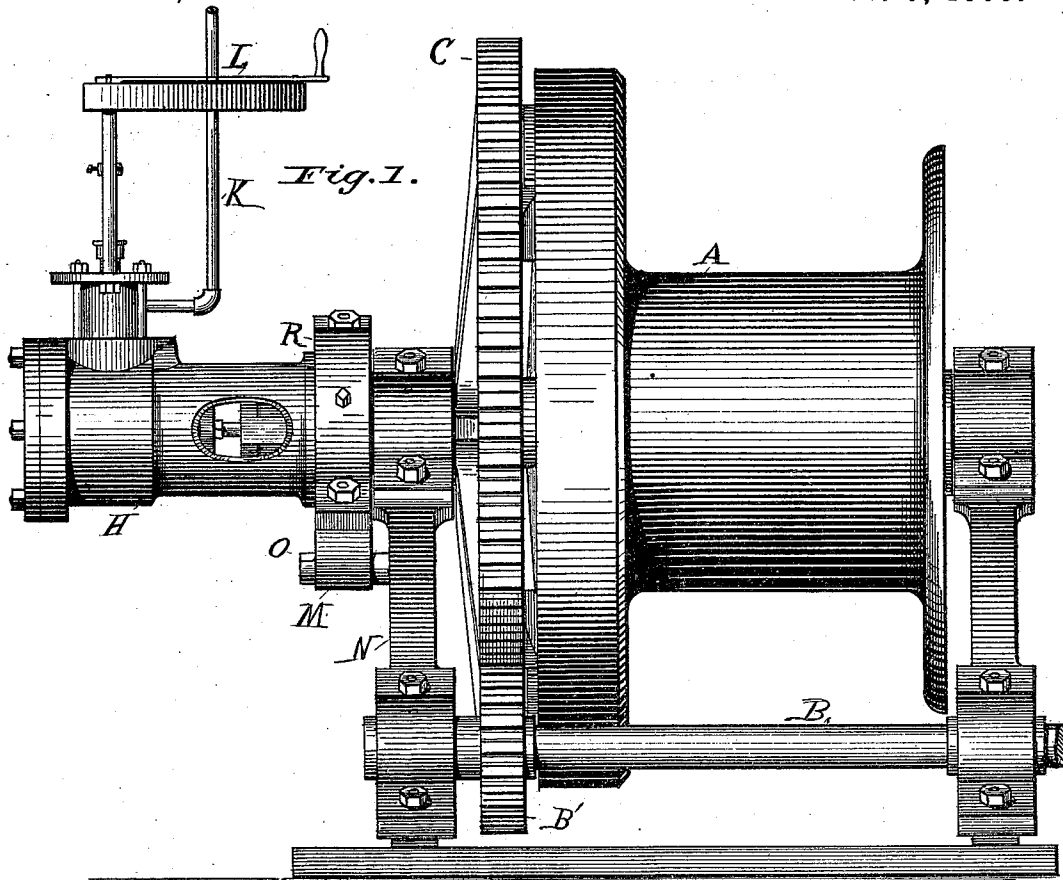


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FRICTION-CLUTCH.

No. 173,362.

Patented Feb. 8, 1876.

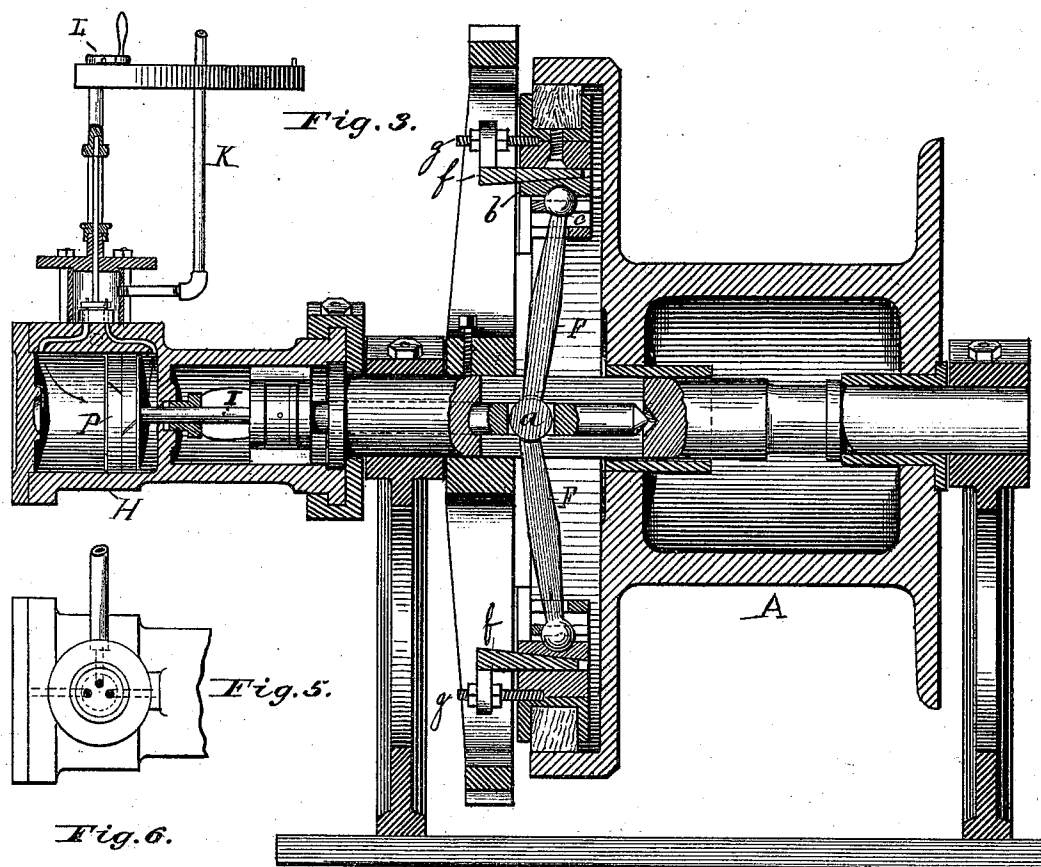


*Attest:*  
O. L. Perrine.  
D. P. Cowl

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Attest:  
H. L. Perrine,  
D. R. Cowe

*Inventor:*  
George H. Starbuck  
by J. M. Yznaga,  
his Attorney.

# UNITED STATES PATENT OFFICE.

GEORGE H. STARBUCK, OF TROY, NEW YORK.

## IMPROVEMENT IN FRICTION-CLUTCHES.

Specification forming part of Letters Patent No. **173,362**, dated February 8, 1876; application filed December 29, 1875.

*To all whom it may concern:*

Be it known that I, GEORGE H. STARBUCK, of Troy, Rensselaer county, and State of New York, have invented certain new and useful improvements in that class of machines known as "Friction-Clutches," of which the following, taken in connection with the accompanying drawings, is a specification:

My invention consists in means for connecting the pressure-cylinder to the hoisting-drum frame, and in means for connecting the operating-arms with the friction-block carriers, which are shown in the drawings.

In the accompanying drawings, Figure 1 is a side elevation of the clutch with its parts assembled for use. Fig. 2 is an end view looking toward the chain-drum, showing the friction-blocks with their carriers and guides, and the operating-arms, with the means employed for connecting them to the friction-block carriers. Fig. 3 is an axial section through the pressure-cylinder and drum. Fig. 4 is a sectional elevation with the cylinder removed, showing the operating-arms passing through the slotted central shaft. Fig. 5 is a plan view, showing the position of the steam-ports; and Fig. 6, a similar view, showing the valve opened to correspond with position of piston in Fig. 3.

Like letters in all the figures indicate corresponding parts.

A represents the hoisting-drum, around which the chain or cable is wound, and which it is desired to connect with the driving-wheel by friction. B is a shaft connected with the power, which, through the pinion B', communicates motion to the driving-wheel C. Upon the inner face of the wheel C are the slotted projections D, which serve as guides for the friction-block carriers E. The friction-blocks are generally of wood, and operate through the arms F upon the inner surface of the flange G of drum A, and serve to connect said drum with the driving-wheel. P is a piston working within the cylinder H, and carrying the rod I, which is slotted at or near its outer end to receive the operating-arms F. Steam is admitted to the valve-chest through the pipe K, and thence through suitable ports upon either side of the piston, accordingly as the valve is turned, which is done by moving the lever L, placed conveniently for the oper-

ator. Steam being admitted, as shown by the arrow in Fig. 3, the piston is forced toward the right; its rod I forces the arms F more nearly into the same straight line, and they, in turn, throw the friction-blocks into contact with the flange of the drum A. The arms F being pivoted, as at *a*, within the slotted piston-rod I, it is necessary to provide means for lengthening these arms to take up any wear upon the friction-blocks, or to adjust them to their proper position for work.

This has heretofore been done by means of a screw-section connecting the arms and the carriers, or two sections of the arms. The means herein intended to be included for accomplishing this adjustment consists, essentially, in a movable seat, *b*, hollowed to receive the rounded end *c* of the arms F. The upper surface of the ball *c* is capped by a slotted plate, *d*, held in position by set-screws *e*. The plates *b* and *d*, together with the ball *c*, form a ball-and-socket joint, which permits all the necessary motions of the arms F. A wedge, *f*, is placed between the movable plate *b* and the carriers, and is made adjustable by means of the screw *g*. If this wedge be set inwardly the arms are practically lengthened, and if it be withdrawn they are correspondingly shortened.

This makes a very simple, cheap, and effective adjustment, and is for many reasons preferable to the ordinary screw.

A collar, M, is secured to the frame N, as by a bolt, O, and is recessed to receive a flange upon the end of the cylinder-frame. A removable cap-square, R, is placed over the flange. This cap-square is recessed similarly to the collar, and is secured thereto by means of bolts, in the usual manner of securing such portions of a machine.

It will be observed that this means of attaching the cylinder to the frame places said cylinder so that its axis is substantially in a line with the axis of the drum, and this insures an easy operation of the several parts of the mechanism, and gives the full benefit of a direct action of the pressing fluid. It will be observed that any fluid under pressure may be employed instead of steam.

In heavy machinery, such as dredges and the like, it requires at times considerable

power to hold the friction mechanism in working position, and when done by means of the lever, as ordinarily, necessitates extreme physical exertion on the part of the operator, and requires his undivided attention. The surfaces brought into contact are, also, often set together with such force that the operator is alone unable to separate them.

These disadvantages are obviated by the means herein employed. The operator has simply to turn the valve-crank, and contact of the friction-surfaces is automatically made. His attention may then be directed elsewhere. The valve-crank being reversed, the surfaces are drawn asunder, and the power with which these operations may be effected will depend upon the size of the steam or pressure cylinder.

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

1. In combination with a pressure-cylinder and the frame of a clutch, a collar and removable cap-square, connecting the two, substantially as described.

2. In combination with the operating-arms F, provided with the balls *c*, the upper and lower plates *d* and *b* and a movable wedge, *f*, operated by the screw *g*, for adjusting the arms, substantially as described.

In testimony that I claim the foregoing I have hereunto set my hand in the presence of two witnesses this 27th day of December, A. D. 1875.

GEORGE H. STARBUCK.

Witnesses:

F. F. HEMMENWAY,  
JAMES W. STARBUCK.