(No Model.) 2 Sheets—Sheet 1.

A. L. STANFORD.

CLUTCH.

No. 346,784. Patented Aug. 3, 1886.

Fig. 1.

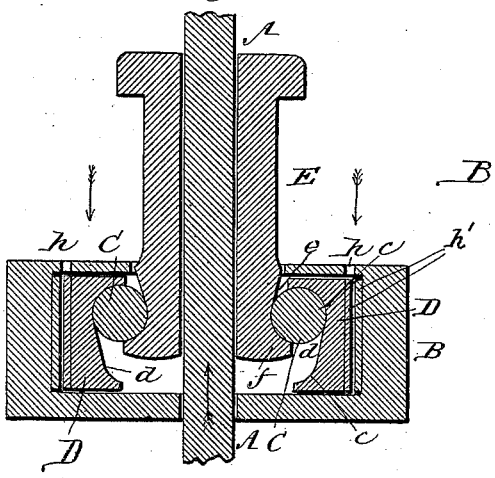


Fig. 2.

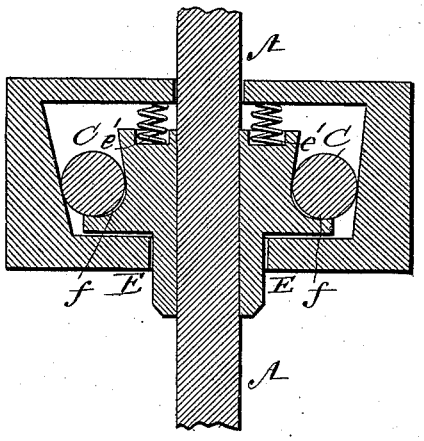


Fig. 3.

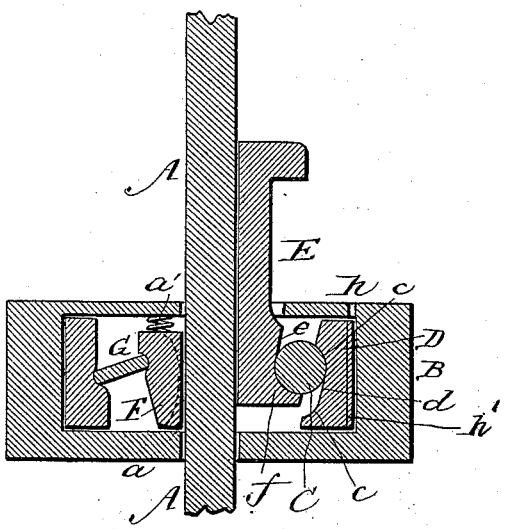
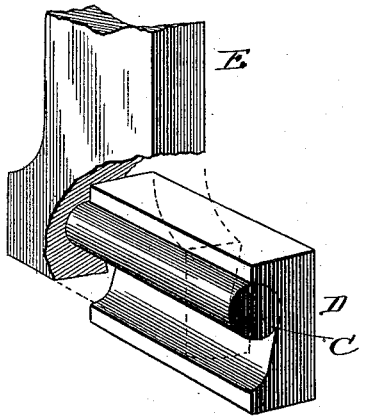


Fig. 4.



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(No Model.) 2 Sheets—Sheet 2.

A. L. STANFORD.

CLUTCH.

No. 346,784. Patented Aug. 3, 1886.

Fig. 5.

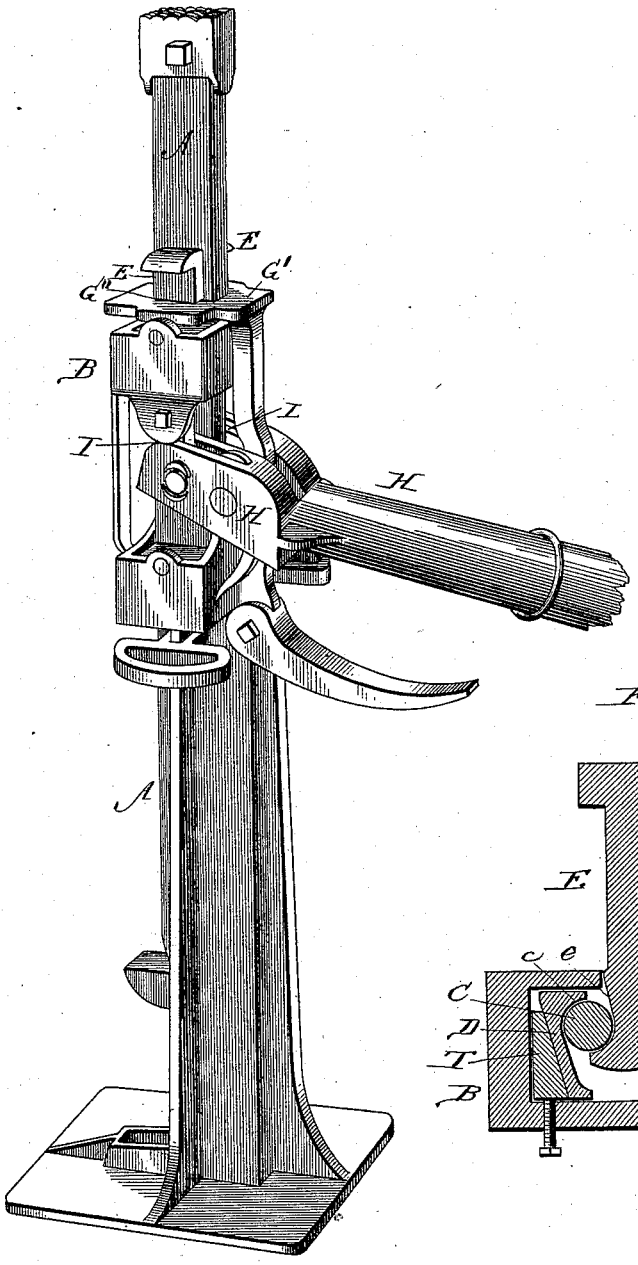
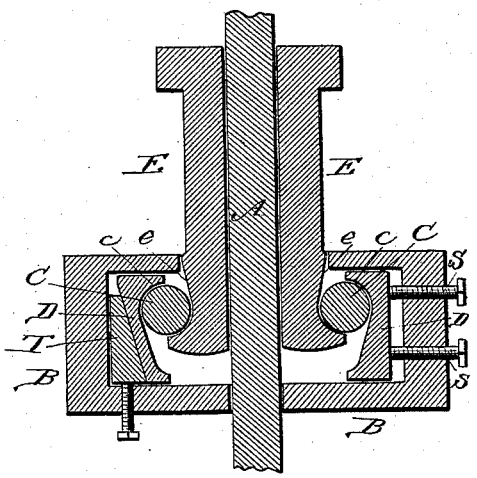


Fig. 6.



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UNITED STATES PATENT OFFICE.

ARTHUR L. STANFORD, OF WAUKEGAN, ILLINOIS.

CLUTCH.

SPECIFICATION forming part of Letters Patent No. 346,784, dated August 3, 1886.

Application filed January 25, 1886. Serial No. 189,728. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR L. STANFORD, a citizen of the United States, residing at Waukegan, in the county of Lake and State of Illinois, have invented certain new and useful Improvements in Friction-Clutches, of which the following is a sufficient specification.

My present invention consists of improvements upon a friction-clutch patented to me by Letters Patent of the United States No. 312,400, dated February 17, 1885; and it consists in the construction and combinations hereinafter set forth and claimed.

My present improvements are susceptible of various applications, and among others for the purpose of tightening or hauling in wire or other rope, anchor or other chains, of raising well-tubing, &c.

In the drawings, Figure 1 is a cross-section of a form adapted to produce a vertical or nearly vertical movement either in an upward or a downward direction, according as either the clutch or the bar, rope, or chain is made movable or fixed. Fig. 2 is a section of a clutch adapted for use in any location or position, and having a spring attachment to the friction-plate in lieu of the force of gravity, which is relied upon when the clutch is operated in a vertical direction. Fig. 3 is a section of a modification involving the use of a gripping-roll upon only one side, and Fig. 4 is a perspective view of the backing-plate and gripping-roll. Fig. 5 shows the application of my clutch to a lifting-jack. Fig. 6 shows the clutch-box with the set-screws S S or wedge T substituted for the shims *h' h'*.

The patentable subject-matter arising from the adaptation of my invention to a lifting-jack is not herein claimed, but is the basis of a separate application filed January 23, 1886, Serial No. 189,527.

A is the bar, rope, or chain to be clutched. B is the clutch-box, which should be of the form shown, or of any other form and construction found convenient. C is the gripping-roll. D is the filling-plate, and E is the friction-plate. I prefer to make friction-plate E, the gripping-roll C, and the backing-plate D of hardened steel, which affords a more durable and efficient wearing-surface, and especially prefer that the filling-plate D shall be so made, which is both movable and adjustable, as hereinafter described. The face *d* of the backing-plate D is inclined toward A, and is terminated at one or both ends by curves or grooves *e*, of a radius preferably nearly equal to that of the gripping-roll C. The friction-plate at *f* has a similar curve or groove. Above this curve or groove *f* the face *e* of the friction-plate may be either parallel to the face *d* or parallel to the axis of A or at any intermediate angle. The lower portion of the friction-plate E projects under the friction-roll C, and the said friction-plate is extended beyond the clutch-box a sufficient length to accommodate the stroke of the clutch-box, and has at its extremity a lug or flange, which operates automatically against the part G' of the standard A to release the clutch.

I have not only made the backing-plate D removable and of the construction or substantially of the construction shown, which constitutes an improvement upon my former construction, in which the gripping-rolls operate against the side of the box, but I have also made the same adjustable for the purpose of accommodating different sizes of the rope, bar, or pipe to be clutched, and so that in operating upon any one article which differs in size the clutch may be adjusted thereto—as, for instance, in raising well-tubing the clutch may be accommodated to the joints or couplings of the tubing, as well as to the pipe or tubing proper, which is of less diameter. This I accomplish by inserting through a slot in the clutch-box *h* shims *h'*. This result may be accomplished also by set-screws S S, extending through the side of the box and against the back of the backing-plate, or by wedges T, as shown in Fig. 6, or in any other convenient manner.

It is apparent that when the clutch is operated in a vertical position the friction-plate E will maintain its proper position by the force of gravity. I have adapted to friction-plate E a spring which may be attached to the said friction-plate at any convenient point, as at *e'*, Fig. 2, the same being also attached to the clutch-box, and thereby the friction-plate is maintained in its proper position without reference to the direction in which it is operated.

In Fig. 3 I have shown the use of the gripping-roll C upon only one side of the clutch-

box, and I prefer to use in connection with it the friction-plate E. Upon the other side of the clutch-box is shown a bearing-plate, F, which may be of either the construction shown in full lines or of the construction shown in dotted lines. If of the construction shown in full lines, it is necessary that the said bearing-plate F shall be supplemented by a pivotal attachment, G, to obviate too great friction between this bearing-plate and the bar operated upon at the point when the friction-clutch is to be released, the pivotal plate G in that case operating between a groove in the bearing-plate F and a corresponding groove or pivot in the box or frame, the bar or plate G being slightly inclined upward from a horizontal position, as shown. The bearing-plate F should be retained at or near the sides of the box or frame, and if this modification be used in a horizontal position it will be necessary to add a spring to keep this bearing-plate in the position named, the object being to prevent its displacement so as that the bar, A, being operated upon shall not bear against the sides of the slots in the box or frame B. When used in a horizontal position, a spring attachment should also be provided for the friction-plate E. The rocking or pivotal bar or plate G may be dispensed with, and the bearing-plate F may be attached in any convenient manner upon this side of the box or frame, if its face be curved, as shown in dotted lines in Fig. 3, so as to present a small or line bearing to the bar, A, being operated upon.

It is manifest that whether gripping-rolls be used upon one or both sides of the clutch-box, two or more gripping-rolls may be used upon the side or sides where they are employed, they being of different diameters and operating between diverging walls, and being thus prevented from coming in contact with each other.

The operation is as follows, reference being had for convenience to Fig. 1, which shows the parts in the position resulting from the movement of the box in the direction of the outer arrows, and in a position ready for the clutching operation, which is produced by moving the clutch in the opposite direction, in which reverse movement the inclined surface *d* forces the roll C against the friction-plate E, and this in turn is forced against the bar, A, operated upon, the pressure increasing as the gripping-roll C proceeds along the face of the backing-plate D, until the friction is sufficient to carry the object operated upon with the clutch apparatus, the whole then moving in the direction of the arrow marked on the bar A, suitable means, preferably a stationary clutch-box containing my improved clutch mechanism, as shown in Fig. 5, being provided for engaging and holding the weight at the end of the stroke until the next succeeding stroke of the clutch-box. The reciprocating motion of the clutch may be effected by a lever, H, and connections I I, as shown in Fig. 5. To allow A to return to its original position it is necessary that some means be provided for taking the weight or strain from the clutch-box. For this purpose I arrange upon the frame or device to which the clutch is attached a support, as at G, Fig. 5, which at the extreme limit of the downstroke of the clutch-box comes in contact with the friction-plate E, thus causing the weight or strain to effect the release of the clutch.

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

1. In a friction-clutch apparatus, the combination of a fixed standard or support, a lifting-bar, a moving clutch-box, and a friction-plate extending beyond the clutch-box, and having at its outer extremity a lug or flange adapted to rest upon the standard or support in the release of the clutch, substantially as set forth.

2. In a friction-clutch apparatus, the combination of a fixed standard or support, a lifting-bar, a moving clutch-box containing a friction-roll, and a friction-plate extending beyond the clutch-box, and having at its outer extremity a lug or flange adapted to rest upon the standard or support in the release of the clutch, and having its inner end within the clutch-box curved to operate in connection with said friction-roll, substantially as set forth.

3. The combination, in a friction-clutch box, of a removable and adjustable backing-plate and adjusting devices, substantially as and for the purpose set forth.

4. In a friction-clutch, the combination of a clutch-box, friction-roll, friction-plate, spring, and lifting-bar, substantially as set forth.

5. A friction-clutch consisting of the clutch-box, a friction roll or rolls working against a diverging surface upon one side of the bar to be operated upon, and having at the other side a bearing-plate, F, and bar G, said plate and bar being pivotally attached, substantially as set forth.

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Witnesses:
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