(No Model.)

D. T. DENTON.

FRICTION CLUTCH.

No. 399,385. Patented Mar. 12, 1889.

Fig: 1.

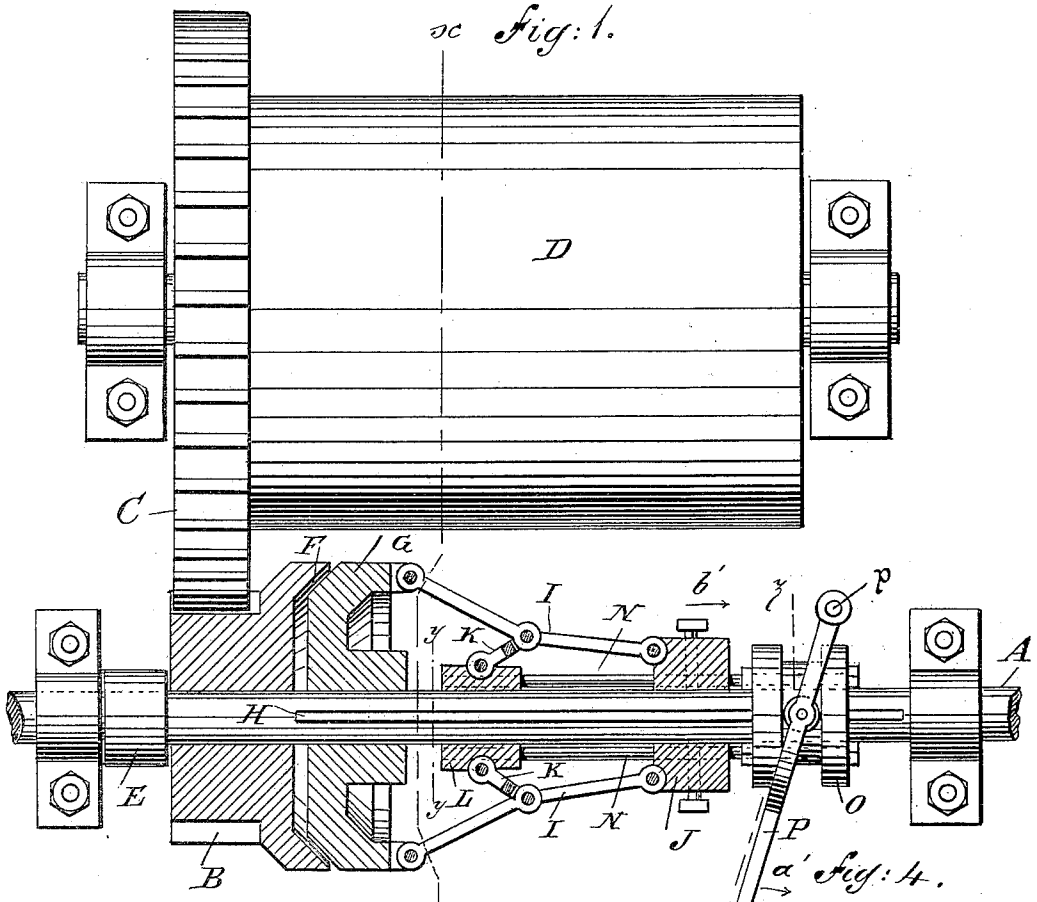


Fig: 2.

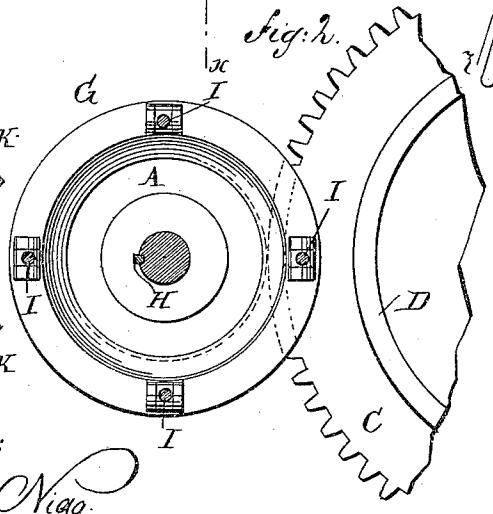


Fig: 3.

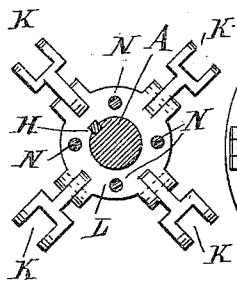
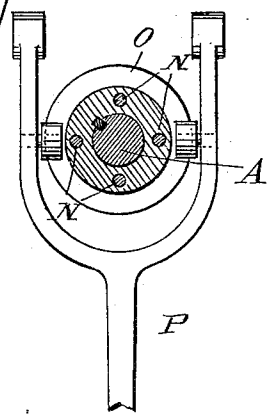


Fig: 4.



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DANIEL T. DENTON, OF SOUDAN, MINNESOTA.

FRICTION-CLUTCH.

SPECIFICATION forming part of Letters Patent No. 399,385, dated March 12, 1889.

Application filed October 1, 1888. Serial No. 286,832. (No model.)

To all whom it may concern:

Be it known that I, DANIEL T. DENTON, of Soudan, in the county of St. Louis and State of Minnesota, have invented a new and Improved Friction-Clutch, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved friction-clutch especially adapted for hoisting machinery in which a powerful friction and large bearing-surface are required.

The invention consists of certain parts and details and combinations of the same, as will be fully described hereinafter, and then pointed out in the claim.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a sectional side elevation of the improvement as applied. Fig. 2 is a sectional end elevation of the same on the line *x x* of Fig. 1. Fig. 3 is a sectional end elevation of part of the improvement on the line *y y* of Fig. 1, and Fig. 4 is a similar view of part of the improvement on the line *z z* of Fig. 1.

The driving-shaft A is provided with a pinion, B, turning loosely on the said shaft A and meshing into a gear-wheel, C, secured or formed on the drum D of the hoisting-machine. One face of the pinion B rests against the collar E, secured on the shaft A, and on the other face of the said pinion is formed a friction-flange, F, adapted to be engaged by a friction clutch-wheel, G, mounted to slide on and to turn with the driving-shaft A as the said clutch-wheel G is held to slide on a key, H, secured to the driving-shaft A.

The clutch-wheel G is pivotally connected by toggle-links I with a collar, J, secured on the main shaft A by a key, set-screws, or other suitable means. The pivot-points of the toggle-links I are pivotally connected by the links K with a collar, L, mounted to turn with and to slide on the driving-shaft A by means of the key H, before mentioned.

To the collar L are secured a number of rods, N, extending parallel with the driving-shaft A and passing loosely through suitable apertures in the fixed collar J. Said rods N are secured to a shifting collar, O, also mounted to turn with and to slide on the driving-shaft A by the said key H. A shifting-lever, P, is fulcrumed in the usual manner on a fixed point, *p*, and engages the said shifting collar O, serving to move the latter forward and backward on the driving-shaft A.

The operation is as follows: When the friction-clutch is in the position shown in Fig. 1, the clutch-wheel G is disengaged from the friction-flange F, so that the shaft A rotates without operating the drum D, as the pinion B does not revolve with the driving-shaft A, on account of being disengaged from the said wheel G. Now, when the operator desires to revolve the drum D, he moves the shifting-lever P in the direction of the arrow *a'*, so that the rods N pull the collar L in the direction of the arrow *b'*, whereby the links K operate the toggle-links I by pushing their arms outward into a straight line. As one end of each toggle-link I is pivoted on the fixed collar J, the other end exerts a pressure against the friction clutch-wheel G in the inverse direction of the arrow *b'*, so that the said friction clutch-wheel G is thrown in frictional contact with the flange F, formed on the pinion B. The driving-shaft A rotates the shifting collar O, the fixed collar J, the collar L, and the clutch-wheel G, so that a like motion is imparted to the pinion B as soon as the said friction clutch-wheel G engages the friction-flange F, as above described. The pinion B, meshing into the gear-wheel C, rotates the drum D. When the operator desires to stop the rotary motion of the drum D, he throws the lever P into its former position, (shown in Fig. 1,) whereby the collar L is moved into its former position, and the links K draw the toggle-links I toward the shaft, and thus draw the friction clutch-wheel G in the direction of the arrow *b'* and out of contact with the friction-wheel F.

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

The combination, with the shaft A, of the pinion B, loose thereon and provided with the friction-flange F, the friction clutch-wheel G, mounted to slide on the shaft, the fixed col-

lar J on the shaft, provided with apertures parallel with the shaft, the sliding collar L on the shaft between wheel G and collar J, the toggle-links connecting said wheel and collar J, the links K, connecting the toggle-links at their joints with the collar L, the sliding collar O, the rods extending therefrom through the apertures in collar J to the collar L, a tongue-and-groove connection between said shaft, the wheel G and collars, and the shifting-lever for operating collar O, substantially as set forth.

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