

(No Model.)

2 Sheets—Sheet 1.

W. H. McCONNELL.
FRICTION CLUTCH.

No. 504,110.

Patented Aug. 29, 1893.

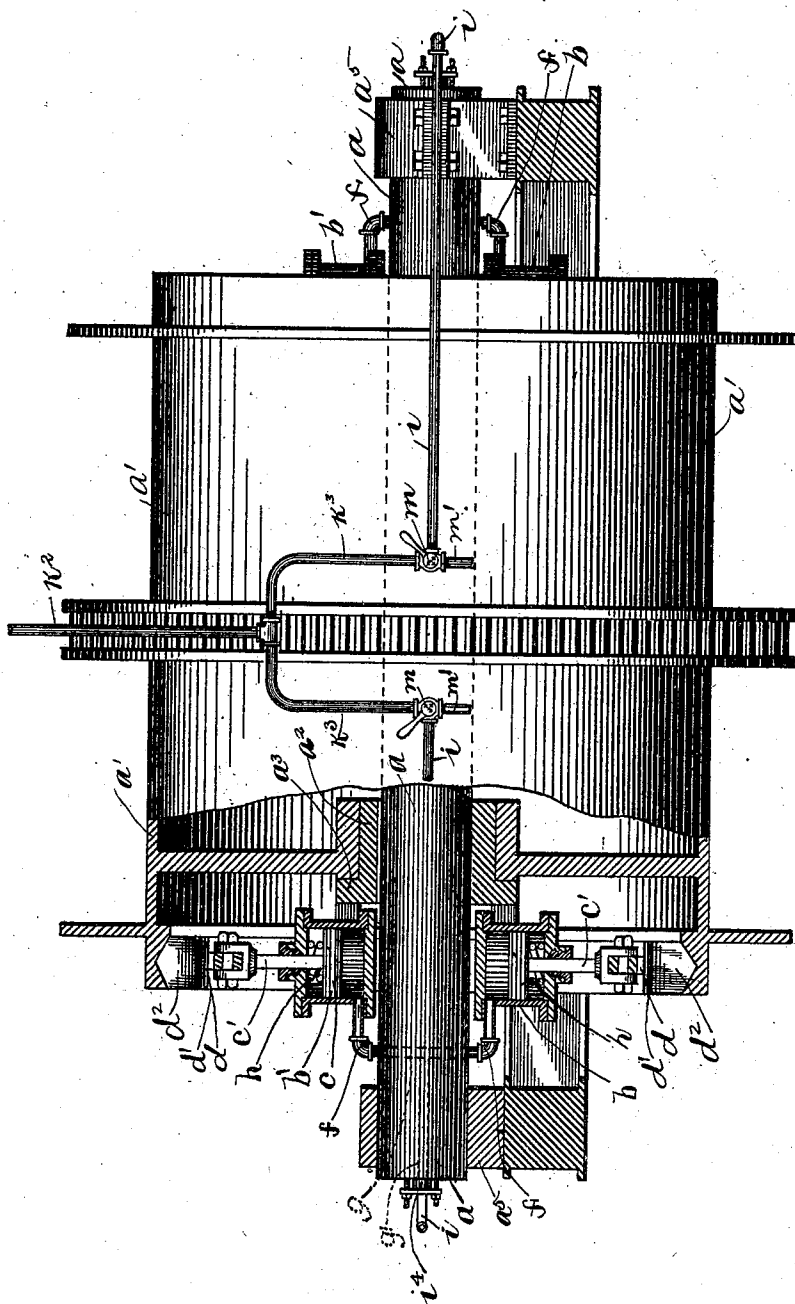


Fig. 1

WITNESSES:

H. B. Bradshaw
A. L. Phelps

INVENTOR
William H. McConnell
BY
Staley and Shepherd
ATTORNEYS

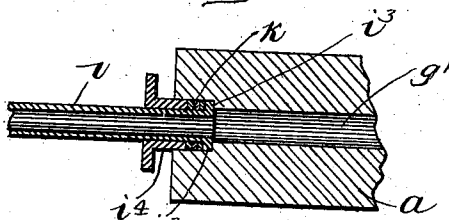
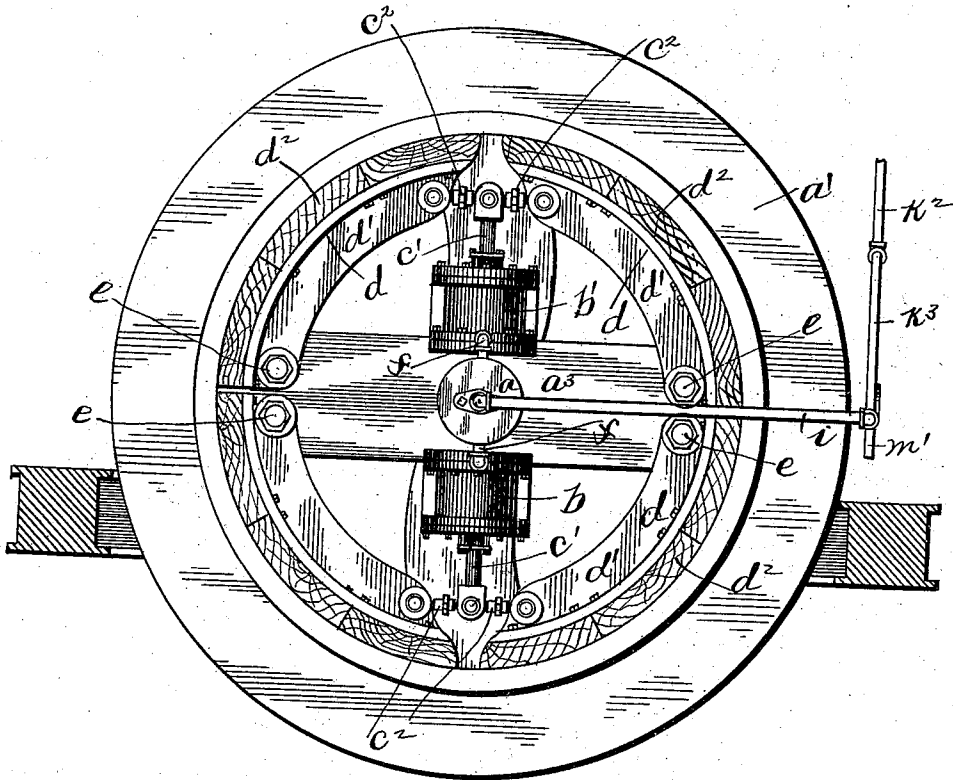
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Patented Aug. 29, 1893.



WITNESSES:

H. B. Burdshaw
A. L. Phelps

INVENTOR
William H. McConnell
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UNITED STATES PATENT OFFICE.

WILLIAM H. McCONNELL, OF NELSONVILLE, OHIO.

FRICITION-CLUTCH.

SPECIFICATION forming part of Letters Patent No. 504,110, dated August 29, 1893.

Application filed January 5, 1893. Serial No. 457,356. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. McCONNELL, a citizen of the United States, residing at Nelsonville, in the county of Athens and State of Ohio, have invented a certain new and useful Improvement in Friction-Clutches, of which the following is a specification.

My invention relates to the improvement of friction clutches and has particular relation to clutches adapted to be operated by steam power and used to temporarily connect a rotating shaft with surrounding wheels, reels, &c.

The objects of my invention are to provide an improved clutch mechanism of the above class, of such construction and arrangement of parts as to facilitate the operation of said clutch; to provide simple and reliable means of operating said clutch by steam or similar power; to construct my improved friction clutch mechanism at a low cost of manufacture and without complication and to produce other improvements which will be more specifically pointed out hereinafter. These objects I accomplish in the manner illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of a double rope reel, mounted upon a shaft, a portion of one of said reels being broken away at one end for the sake of illustrating the clutch and operating mechanism which are shown in section. Fig. 2 is an end view of one of said reels showing my improved clutch in use therein, and Fig. 3 is a detail view in section of the outer end of the reel carrying shaft, showing in section therein the inner end of the steam inlet pipe and its socket or rotary joint.

Similar letters refer to similar parts throughout the several views.

a represents a shaft which is provided with suitable end bearings a^1 and upon which may be mounted loosely rope reels or other similar bodies a' . Keyed to the shaft a at a point near the end of each of the reels a' is the central and hub portion a^2 of a transverse bar or plate a^3 .

b b' represent steam cylinders, which as shown are supported on opposite sides of the shaft a in front of the central portion of the plate a^3 to which said cylinders are rigidly connected. Of these cylinders c represents the piston heads and c' the pistons which pass outwardly in the usual manner through the

outer ends of said cylinders. The outer end of each of the pistons c' is jointly connected by toggle arms c^2 with the corresponding ends of clutch shoes d . These clutch shoes d are curved to conform to arcs of the circle formed by the reel a' and each of said shoes preferably consists of a metallic casting d' , T shaped in cross section, the outer and broader face of which is provided with a covering of wood d^2 . The remaining or inner ends of the shoes d are as shown in the drawings at e , pivotally connected with the plate a^3 at points at or adjacent to each other and at the ends of said plate. From each of the cylinders b b' leads outwardly a steam pipe f , said steam pipes having their outer ends communicating with the ends of a transverse passage g formed through the shaft a and shown in dotted lines, said passage g communicating at the center of its length with a horizontal passage g' formed centrally in the outer end portion of the shaft a and opening outward at said shaft end.

h represents a short coiled spring cushion one of which I cause to surround the piston c' between the outer end or head of each of the cylinders and the piston head thereof, the tension of said springs being such as to normally force said piston heads inward sufficiently to draw the shoes inward out of engagement with the reel. i represents a steam feed pipe one end of which communicates with the central passage g' of the shaft end.

As shown in Fig. 3 of the drawings, I so connect said pipe i with said shaft passage g' as to admit of the shaft being rotated about the end of the pipe i without interference therewith and at the same time form a steam tight connection between said pipe and passage. This I preferably accomplish by inserting the end of the pipe i within the enlarged outer end of the passage g' and having formed above said inserted pipe end a flange i^2 which is adapted to bear against the shoulder i^3 formed by said enlargement of said passage g' . About the pipe i is fitted a collar i^4 , which is adapted to be partially inserted within the enlarged end of the passage g' and between said collar or plug and said end flange i^2 , I provide suitable packing matter k . From this construction, it will be seen that the shaft a may be rotated without carrying with it the

pipe *i*. However, it is obvious that other well known forms of pivotal pipe connections might be employed for this purpose.

As will be seen from the illustration, the clutch mechanism herein described is employed in the outer ends of both reels where a double reel is employed. k^2 represents a steam supply pipe and k^3 branch pipes thereof which lead to the cylinder feed pipes *i*. At the points of connection between the supply branch pipes k^3 and the pipes *i*, I provide three-way valves *m*, by means of which a communication may be formed in the usual manner between the pipes k^3 and *i*, or the pipes *i* and an exhaust outlet pipe or tube *m'*.

The manner of utilizing and operating my improved clutch mechanism, is as follows: Presuming that the three-way valves *m* are so turned as to cut off communication with the exhaust tubes *m'* and to produce a communication of the pipes k^3 and *i* and that the piston rods are forced inward sufficiently to draw the shoes *d* away from engagement with the inner surfaces of the reels, the operation of producing a clutch connection between the shaft and reels, will be as follows: The steam which enters the cylinders through the medium of the pipes k^3 , *i* and *f* and the pistons *g g'* must result in forcing the piston heads and pistons outwardly and in the drawing of the toggle arms c^2 to the horizontal positions shown. This movement of the toggle arms as will readily be seen must result in such outward pressure of the shoes *d* as to cause a desired frictional contact of the latter with the inner surfaces of the reels. It will be observed that in the construction of my improved clutch, a connection is formed through the steam cylinders between the clutch shoes and the shaft, and that said steam cylinders will be rotated with said shaft. It will also be seen that the connection of these parts is such as not to interfere in any manner with the proper operation of the pistons, during said rotary movement. In order to throw the clutch shoes out of engagement with the reels, the three-way valves may be so turned as to cut off communication with the pipes k^3 and produce a communication between the pipes *i* and *m'*. This change in said valves must result in the steam con-

tained in the cylinders exhausting out through said pipes *f*, passages *g g'* and pipes *i* and *m'*. The cylinders being thus relieved of the steam pressure, it is evident that the coil springs *h* will serve to press the piston heads inward sufficiently to draw the shoes away from engagement with the reels, thus admitting of an independent movement of the shaft and reels.

The construction which I have shown and described herein is such as to result in the production of a substantial and reliable clutch mechanism, without complication and at a low cost of manufacture. It is evident that the parts of my improved clutch mechanism are of such formation and arrangement and are so connected as to relieve any tendency toward the same getting out of order or being readily worn.

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

1. In a friction clutch mechanism the combination with a journaled shaft *a*, a steam cylinder connected therewith and carried thereby, a piston head and piston rod working in said cylinder as described, of a clutch shoe jointedly connected with said piston rod, and a spring cushion between said cylinder head and piston head and means for introducing steam into said cylinder and exhausting it therefrom, substantially as and for the purpose specified.

2. In a friction clutch mechanism, the combination with a journaled shaft, steam cylinders *b b'* rigidly connected with said shaft, piston heads and rods working in said cylinders, inlet pipes *f* leading to said cylinders, a feed pipe *i* and a supply pipe connected therewith, a three-way valve at the junction of said feed and supply pipes, a rotary joint between said pipes *f* and *i*, a cross plate a^3 fixed on said shaft and clutch shoes jointedly connected with said piston rods and pivotally connected with said cross plates, substantially as and for the purpose specified.

WILLIAM H. McCONNELL.

In presence of—

W. C. HICKMAN,
JAS. S. KNIGHT.