

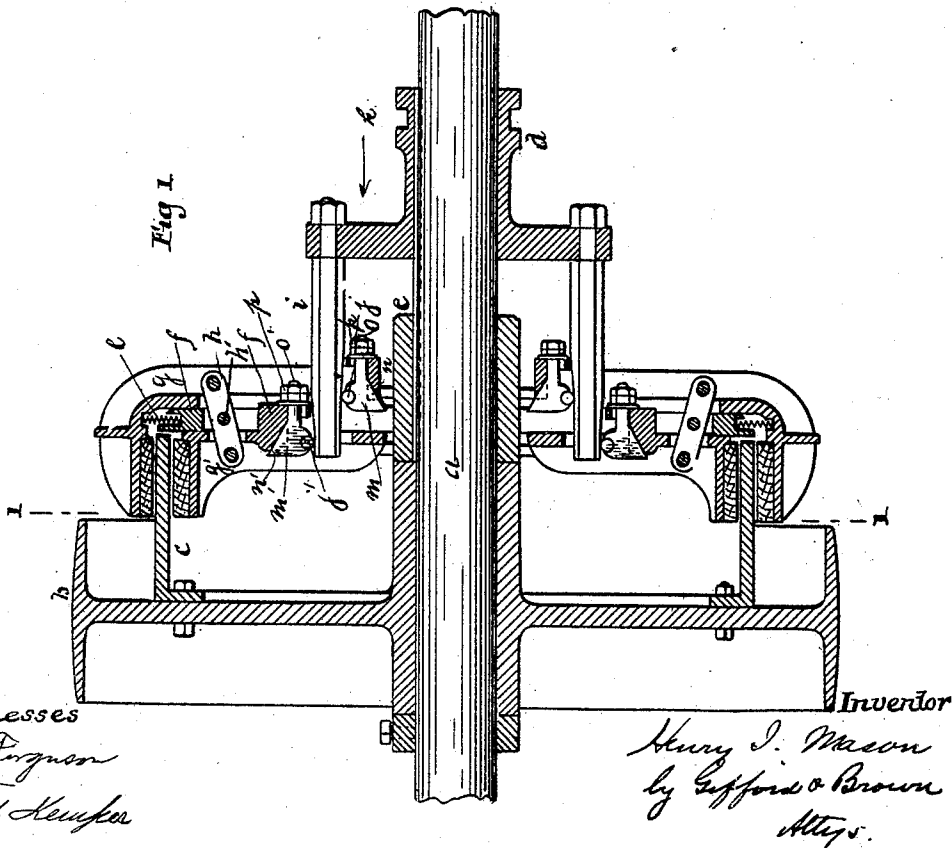
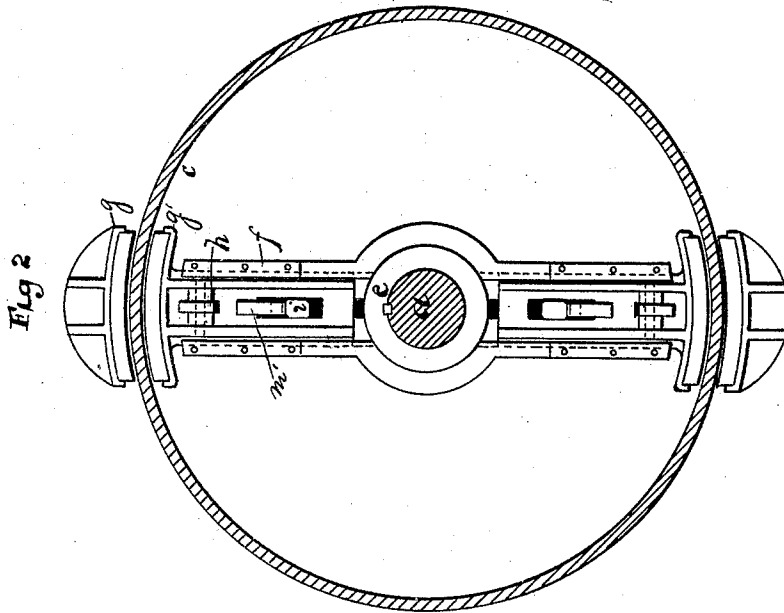
(No Model.)

2 Sheets—Sheet 1.

H. I. MASON.
FRICTION CLUTCH.

No. 465,596.

Patented Dec. 22, 1891.



Witnesses
C. A. Ferguson
Thos. Humphreys

Inventor
Henry I. Mason
by Gifford & Brown
Attys.

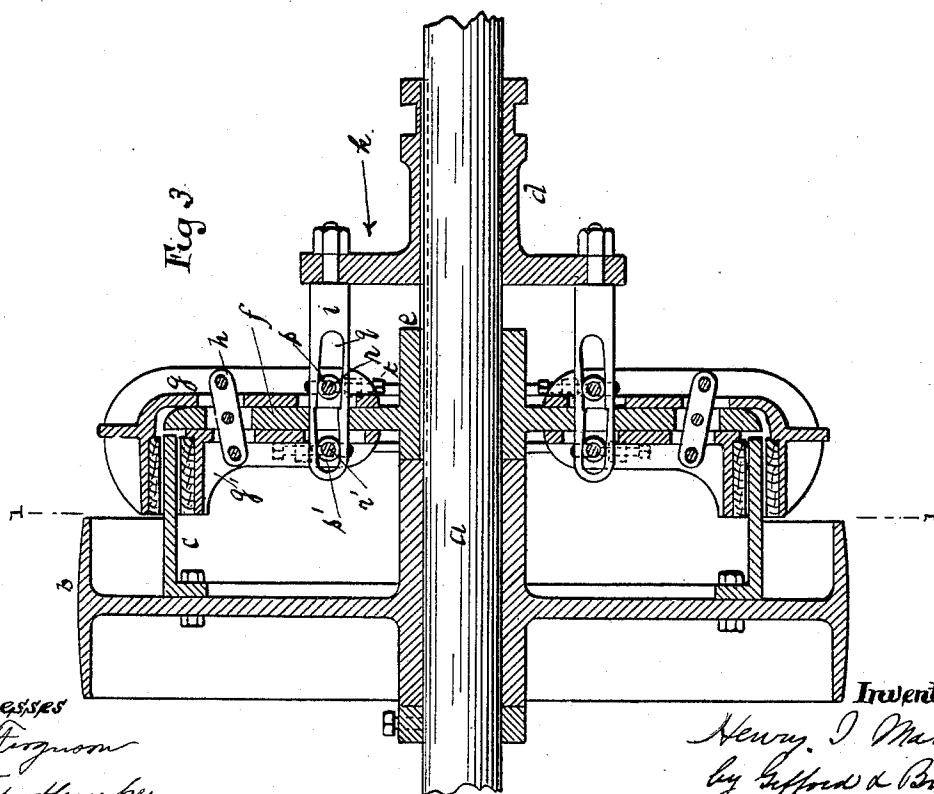
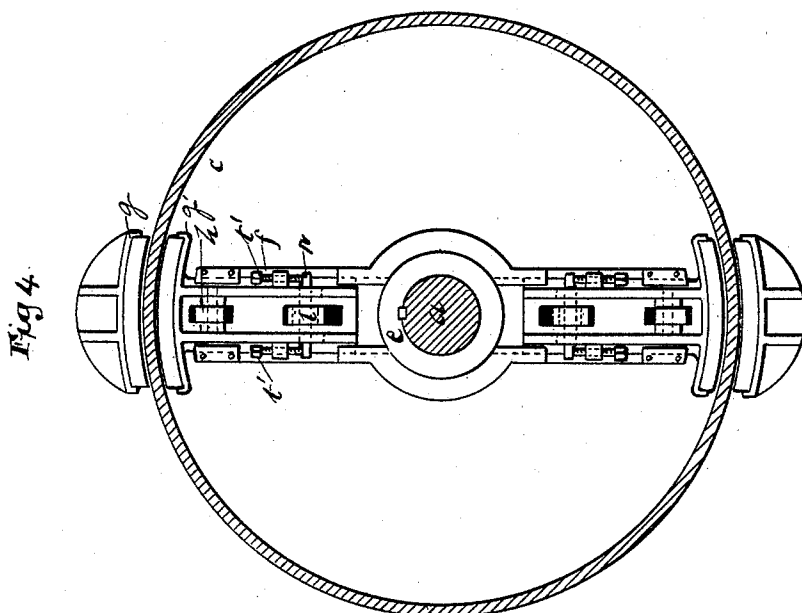
(No Model.)

2 Sheets—Sheet 2.

H. I. MASON.
FRICTION CLUTCH.

No. 465,596.

Patented Dec. 22, 1891.



Witnesses
O R Ferguson
Fred Hemper

Inventor
Henry J. Mason
by Gifford & Brown
Attys.

UNITED STATES PATENT OFFICE.

HENRY I. MASON, OF CUYAHOGA FALLS, OHIO.

FRICTION-CLUTCH.

SPECIFICATION forming part of Letters Patent No. 465,596, dated December 22, 1891.

Application filed April 11, 1889. Serial No. 306,830. (No model.)

To all whom it may concern:

Be it known that I, HENRY I. MASON, of Cuyahoga Falls, Ohio, have invented a new and useful Improvement in Friction-Clutches, of which the following is a specification.

This invention relates to that class of clutches in which a cylindrical flange is grasped by two jaws, which move inversely and radially upon a clutch-arm. Examples of this class are shown in Letters Patent of the United States numbered 383,104, dated May 22, 1888, issued to Crowell, No. 367,856, dated August 9, 1887, to Slayton, and No. 308,872, dated December 9, 1884, to Brock.

This invention relates to the mechanism by which the motions of the shifting-sleeve are communicated to the jaws for operating the clutch; and it consists in the interposition of an inclined surface between a projection from the sleeve and a bearing connected with each jaw, whereby when the projection from the sleeve is forced forward the jaws will be forced toward each other.

In the drawings, Figure 1 is a longitudinal section through the axis of the pulley and clutch. Fig. 2 is a transverse section of the same through the line 1 1 of Fig. 1. Figs. 3 and 4 are similar sections of modifications.

Similar letters of reference indicate similar parts in all the figures.

a is the shaft.

b is the pulley, loose upon the shaft.

c is the flange, cylindrical to and concentric with the shaft.

d is the shifter-sleeve.

e is a hub keyed fast to the shaft, from which project radially the clutch-arms *f*.

g and *g'* are the jaws, which are formed, as shown, so as to grasp the cylindrical flange upon the inside and outside thereof, and which are arranged to slide in guideways on the clutch-arm, being held thereon, preferably, by a tongue-and-groove connection. The friction-surfaces of these jaws are preferably faced with wood.

h is a rocker, which is pivoted at *h'* to the clutch-arm in the middle and at either end to one of the jaws, sufficient play being introduced around the pivots to permit of the free reciprocation of the jaws in their guideways. A function which this rocker performs is to insure a corresponding motion of the two jaws

in inverse directions and communicate the centrifugal force of each jaw to the other, so that the two forces, acting in opposite directions, will more or less counterbalance each other, depending upon the respective weights of the jaws.

I will now describe the form shown in Figs. 1 and 2. *i* is a piece projecting forward from the shifter-sleeve *d*. This projecting piece extends through a hole cut through the stem of each jaw and through the clutch-arm. On the lower side of this projecting piece, where it passes through the stem of jaw *g*, it is provided with an inclined bearing-surface. Another inclined bearing-surface, but inclined in the opposite direction, is provided on the upper side of the piece *i* where it passes through the stem of jaw *g'*. Below the lower inclined bearing-surface of the projecting piece *i* the stem of jaw *g* is provided with a bearing-surface resting against said inclined bearing, which bearing-surface is preferably provided with a roller *j* to reduce the friction. The stem of the jaw *g'* is provided with a corresponding bearing-surface resting against the inclined bearing upon the upper side of the projecting piece *i*, which bearing-surface is preferably provided with a roller *j'* to lessen the friction. Now it is evident that the forcing of the shifter-sleeve *d* forward in the direction of the arrow *k* will cause the jaws to move inversely, so as to grip the flange, and that motion of the shifter-sleeve in the opposite direction will release the pressure upon the jaws, so that they may separate either by the action of centrifugal force or by the operation of a spring, as *l*. The separation or tendency to separate by the action of centrifugal force may be accomplished by having the outer jaw *g* of equal or greater weight with the inner jaw *g'*, so that the greater distance of the center of gravity of the outer jaw from the center of the shaft will, upon the rotation of the clutch, cause it to exert a greater centrifugal force than the inner jaw and therefore to move radially outward, pushing at the same time the inner jaw radially inward, because of their being coupled together by the rocker. It is, however, desirable that means should be provided for taking up the wear of the friction-surfaces, and to this end the friction-rollers *j* and *j'* may be mounted,

respectively, in the pieces m and m' , each of which is located in a slot cut through the stem of its jaw. Each piece m and m' is formed with an incline n n' on the opposite side to the friction-roller, and in each case this incline is in contact with a corresponding incline upon the stem of the jaw, so that by sliding these inclines upon each other each friction-roller may be forced forward toward the projecting piece i . These inclines are moved and held in fixed positions by the screws o and o' , projecting from them through slots in their respective jaw-stems, as shown, in the direction of the shifting-lever, where the jam-nuts p and p' upon the screws are readily accessible to the operator to adjust the position of the pieces m and m' . Now it is evident that by adjusting the pieces m and m' toward the right the jaws will be brought nearer together and that by adjusting them toward the left they will be moved farther apart.

I will now describe the modification shown in Figs. 3 and 4. In this case the projecting piece i extends, as before, through holes cut through the jaw-stems and clutch-arm; but in this case the inclined bearing-surfaces of the projecting piece i , instead of being located upon the exterior thereof, are located in a slot q , cut through the same, the portion of the slot opposite to the jaw-stem g being inclined in one direction, as shown, and that portion opposite the jaw-stem g' being inclined in the opposite direction. Across the opening in the jaw-stem g is a shaft or bar r , mounted at opposite ends in the jaw, which passes through the slot q of the piece i . A corresponding shaft or rod r' crosses the opening in jaw-stem g' , and also passes through the slot q . Upon the shaft or rod r , where it passes through the slot q , is mounted a friction-roller s , and a corresponding friction-roller s' is mounted upon the rod or shaft r' where it passes through the slot q . Each of these friction-rollers is in diameter nearly equal to the width of the slot q , so that there is very little play in either direction between either fric-

tion-roller and the piece i . Now it will be observed that when the shifter-sleeve is moved in the direction of the arrow k the friction-roller s will run upon the incline at the top of the slot q and force the jaw g inward, whereas the friction-roller s' will run upon the incline at the bottom of the slot q and force the jaw g' outward. On the other hand, when the shifter-sleeve is moved in the opposite direction the two friction-rollers will run upon the inclines at the opposite sides of the slot q and permit or produce the reverse movement of the jaws.

Although I have shown the inclined surfaces as being located upon the projecting piece i and the friction-rollers as located upon the jaw-stems, I do not wish to be confined to such relative arrangements of those parts, nor do I wish to be confined to the employment of friction-rollers.

It remains to provide means for adjustment to take up the wear of the friction-surfaces, and for this purpose the ends of the shafts or rods r r' may be mounted in slots in the jaw-stems, so that by the use of the set-screws t t' the rods or shafts r r' may be respectively adjusted to and from the shaft, so as to bring the jaws nearer together or farther apart.

I claim—

In combination, the friction-flange cylindrical to the shaft, the inversely radially moving jaws adapted to grip said flange inside and out, the clutch-arm upon which said jaws move, the rocker by which one jaw is compelled to respond to the motions of the other, the shifting-sleeve, and the piece projecting from the shifting-sleeve and having the inversely-inclined planes interposed between said piece and said jaws, respectively, whereby said jaws are moved inversely by the movement of the shifting-sleeve, substantially as described.

H. I. MASON.

Witnesses:

ORLANDO WILCOX,
H. J. STAMBAUGH.