

(No Model.)

2 Sheets—Sheet 1.

J. C. HARTMAN.  
FRICTION CLUTCH.

No. 442,703.

Patented Dec. 16, 1890.

Fig. 1.

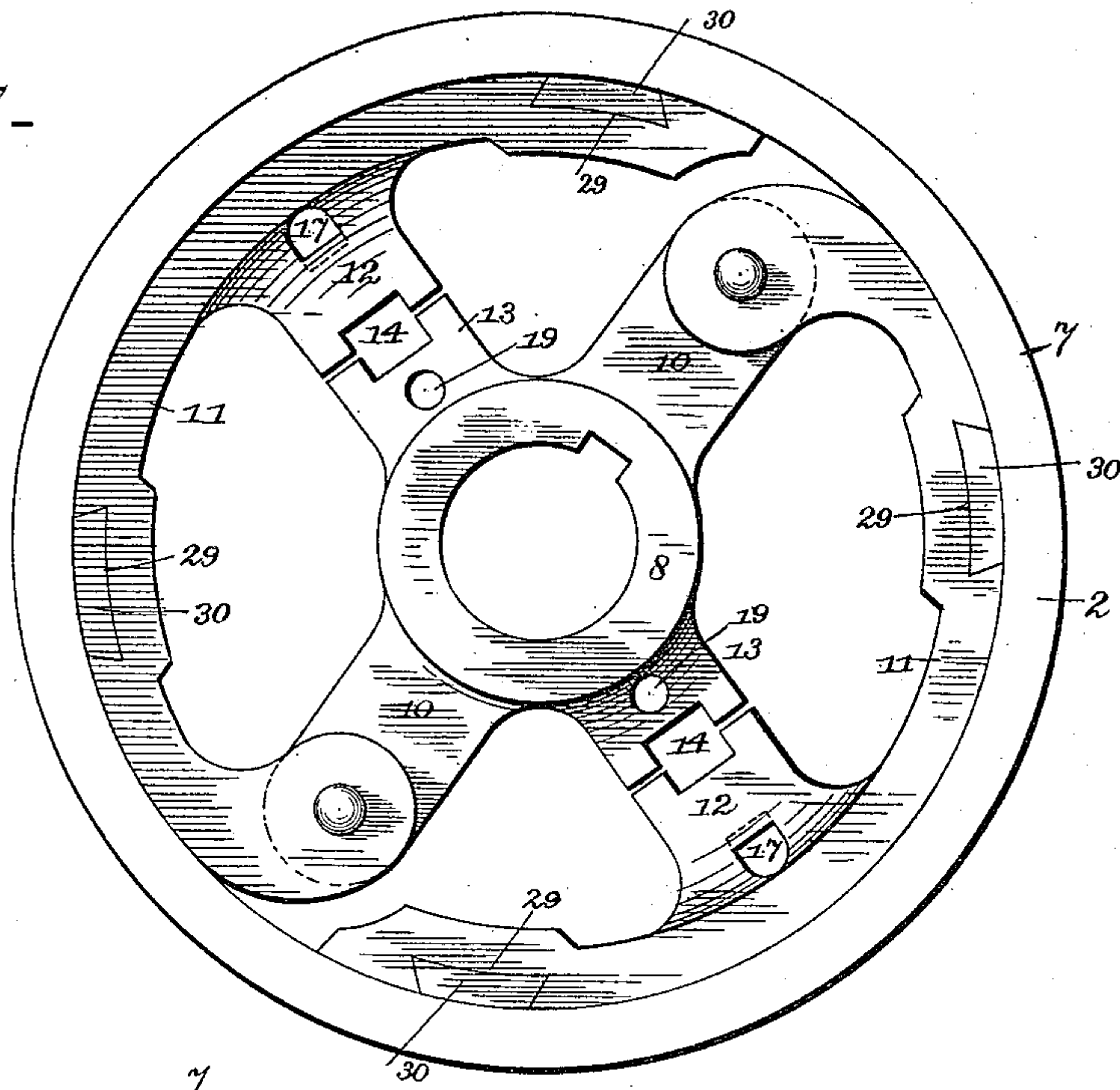
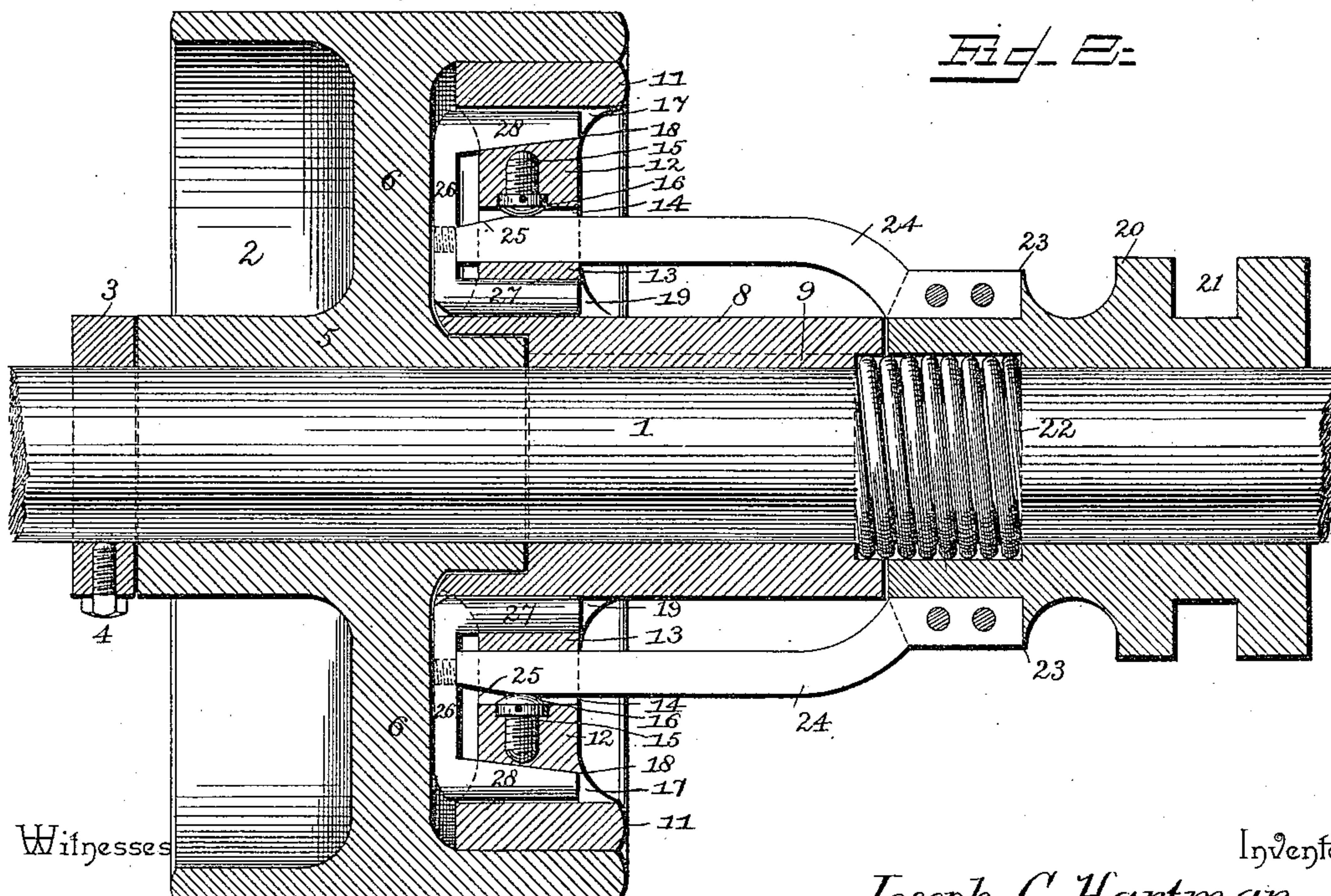


Fig. 2.



Witnesses

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Fig. 3.

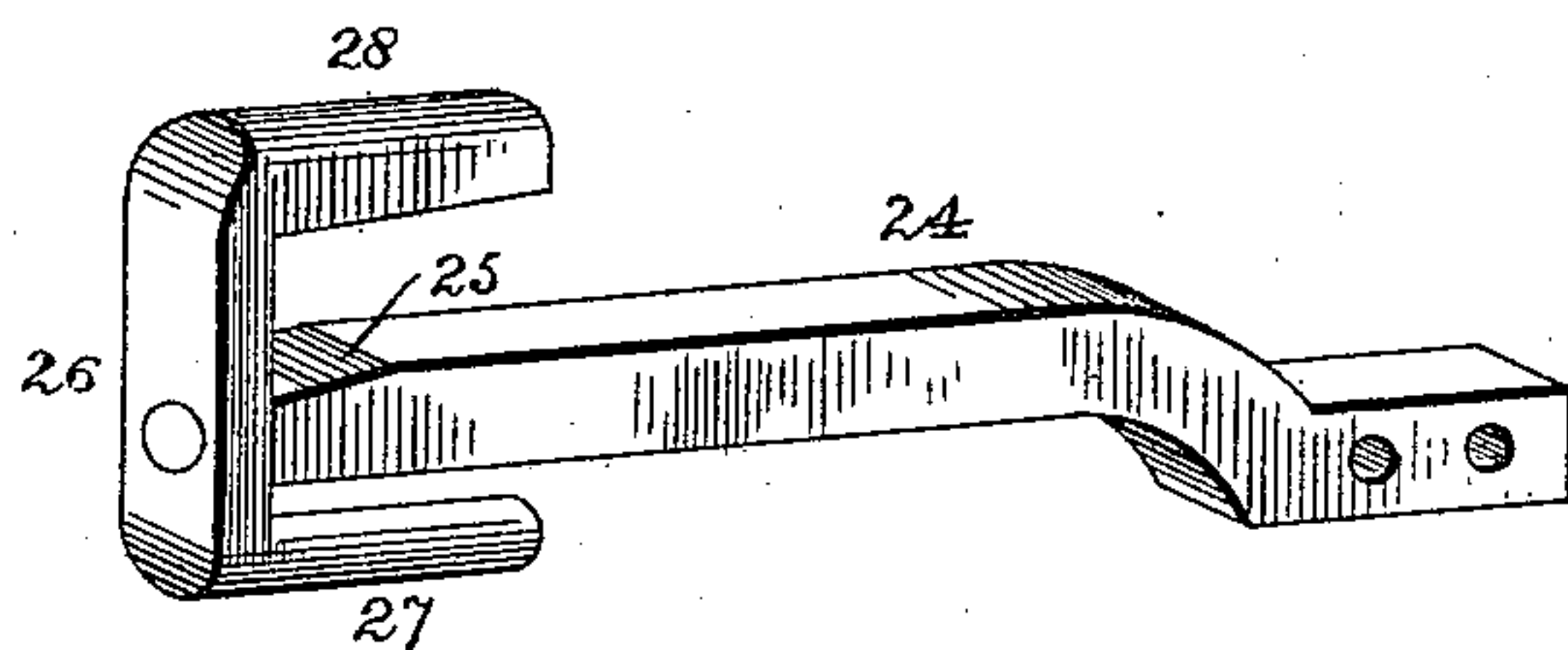
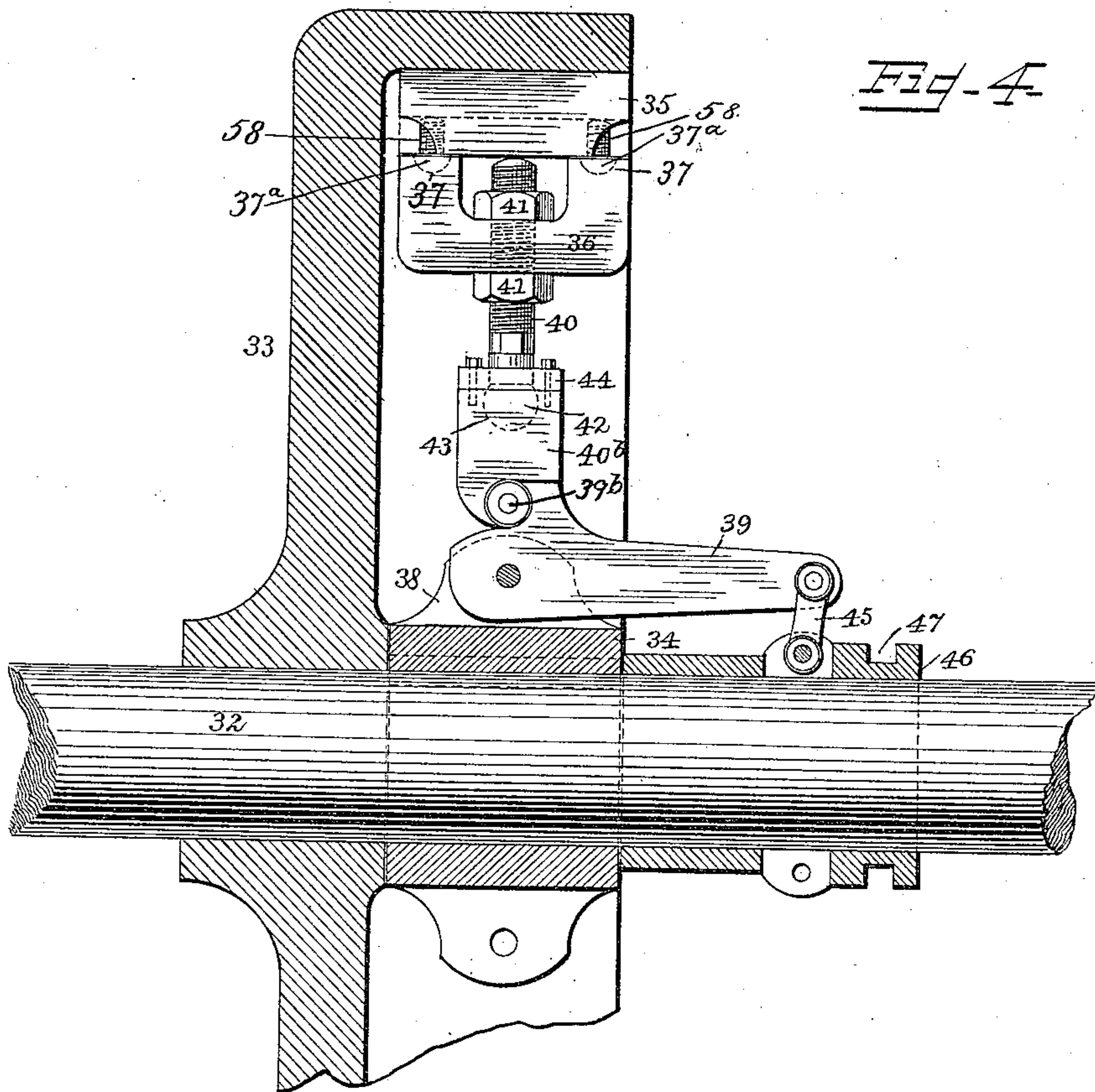


Fig. 4.



Witnesses

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# UNITED STATES PATENT OFFICE.

JOSEPH C. HARTMAN, OF CLEVELAND, OHIO.

## FRICITION-CLUTCH.

SPECIFICATION forming part of Letters Patent No. 442,703, dated December 16, 1890.

Application filed April 15, 1890. Serial No. 348,037. (No model.)

*To all whom it may concern:*

Be it known that I, JOSEPH C. HARTMAN, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a new and useful Friction-Clutch, of which the following is a specification.

This invention relates to friction-clutches; and it has for its object to construct a device of this class which shall possess superior advantages in point of simplicity, durability, and general efficiency.

With these ends in view the invention consists in the improved construction, arrangement, and combination of parts, which will be hereinafter fully described, and particularly pointed out in the claims.

In the drawings hereto annexed, Figure 1 is a side view of a hub and gripping mechanism forming a part of my improved friction-clutch. Fig. 2 is a sectional view taken longitudinally through a shaft having a pulley and provided with my improved clutch mechanism engaging said pulley. Fig. 3 is a perspective detail view of one of the wedging devices for setting and releasing the clutch-leaves. Fig. 4 is a sectional view illustrating a modified form of my invention, whereby the same is especially adapted for large pulleys.

Like numerals of reference indicate like parts in all the figures of the drawings.

In the drawings hereto annexed I have shown my invention as applied to a loose pulley.

1 designates the shaft; 2, the pulley; and 3 is a collar which is secured to the shaft by means of a set-screw 4 to limit the endwise movement of the pulley. The latter consists of the hub 5, which is provided near the end which is distant from the collar 3 with the spokes 6, carrying the rim 7.

8 designates a sleeve, which is mounted securely upon the shaft adjacent to the hub 5 of the pulley by means of a key or spline 9. Said sleeve is provided on diametrically-opposite sides with radial arms 10, to the outer ends of which are hinged the segmental friction-leaves 11, that are adapted to bear against the inside of the rim 7 of the pulley, and each of which reaches almost to the diametrically-opposite arm 10. It will thus be seen that in

practice there will be frictional contact between the said leaves and almost the entire circumference of the rim of the pulley.

Each of the friction-leaves 11 is provided with an inwardly-extending arm 12, adapted to engage or rest upon a seat 13, extending from and forming an integral part of the sleeve or hub 8. The adjacent faces of the arms 12 and seats 13 are provided with recesses 14, and in the recesses 14 of the arms 12 are seated the adjusting-screws 15, which have convex bearing-faces 16 of hardened steel. The arms 12 of the friction-leaves 11 are provided with transverse perforations 17, the inner walls 18 of which are beveled or ridge-shaped, as shown, and the radial extending arms 13 of the hub or sleeve are provided with transverse perforations 19.

Mounted upon the shaft 1 adjacent to the sleeve 8 is a collar 20, having an annular groove 21, in which engages a shipping-lever of suitable construction, by means of which the said collar may be slid lengthwise upon the shaft. A coiled spring 22 is interposed between the collar 20 and sleeve 8 to keep the said collar normally apart from the sleeve. The collar 20 is provided in diametrically-opposite sides with recesses 23, in which are secured the arms 24, the outer ends of which are wedge-shaped, as shown at 25, and extended through the recesses 14 in the meeting faces of the arms 12 and seats 13. To the extreme outer ends of the arms 24 are secured the yokes 26, having the guide-arms 27, extending through the perforations 19 in the seats 13, and wedge-shaped arms 28, extending through the perforations 17 of the arms 12 of the friction-leaves. The wedge-shaped portions 25 of the arms 24 are adapted to bear against the adjusting-screws 15 in the friction-leaves.

The outer or bearing faces of the friction-leaves are provided with transverse dovetailed recesses 29, in which are secured bearing-blocks 30, of wood, fiber, or any suitable material. By this construction an exceedingly-important advantage is gained over friction devices in which surfaces of iron or entire surfaces of iron and wood are caused to engage each other, as is usually the case. Where entire surfaces of iron are made to en-



gage each other, the meeting faces are always exposed to a very considerable wear caused by the faces grinding against each other, and other surfaces are more or less liable either to slip or to grip each other with a suddenness and tenacity that is very injurious to the machinery of which such friction devices may form a part.

By the improved construction herein described I retain all the advantages of meeting faces of iron, while at the same time the interposed friction-blocks not only prevent the meeting faces from grinding and wearing excessively, but actually add to the efficiency of the gripping device.

The operation of my invention as described in the foregoing will be readily understood. By moving the collar 20 in the direction indicated by the arrow the wedge-arms 24 will bear against the screws 15 and thus force the friction-leaves in an outward direction and into contact with the inner face of the rim of the pulley, which is thus caused to revolve with the shaft. By moving the collar 20 in the opposite direction the wedge-arms 28 of the yokes 26 will force the friction-leaves in an inward direction and out of engagement with the pulley.

It is obvious that by making such modifications as will readily suggest themselves to the skilled mechanic my invention may be readily applied to pulleys that are mounted fixedly upon the shaft for the purpose of transmitting motion through the medium of the clutch to other parts to be driven.

By the modification of my invention, which has been shown in Fig. 4 of the drawings, and which is more especially adapted to large-sized pulleys, 32 designates the shaft; 33, the pulley; 34, the sleeve, which is keyed upon the shaft adjacent to the pulley and which is provided with radially-extending arms, to which are hinged the friction-leaves 35, and 36 are yokes having semi-spherical recesses 37 engaging the semi-spherical heads 37<sup>a</sup> of screws 38, which enter the friction-leaves 35, thus practically forming ball-joints between said leaves and yokes. The sleeve 34 is provided with seats 38, to which are hinged or pivoted the bell-crank levers 39. To the inner short arms of said bell-crank levers are connected by joints 39<sup>b</sup> the extension-arms 40<sup>b</sup>, to the outer ends of which are connected the adjusting-screws 40, the outer ends of which are extended through suitable perforations in the yokes 36, on opposite sides of which they are provided with clamping-nuts 41. The inner ends of said adjusting-screws terminate in spherical heads 42, that are

seated in suitable sockets 43 in the extension-arms of the bell-crank levers, where they are held by means of caps 44. The outer ends of the long arms of the bell-crank levers are connected by links 45 with the sliding collar 46, having an annular groove 47 to engage the shipping-lever.

The operation of the modification of my invention above described will be readily understood. By sliding the collar 46 longitudinally upon the shaft the bell-crank levers will be operated so as to throw the friction-leaves into or out of engagement with the rim of the pulley, as the case may be, the screws 40 having been previously adjusted so as to cause the said friction-leaves to bear equally and simultaneously against the rim of the pulley.

In the practical manufacture of my invention other modifications than the one herein described may prove to be desirable in order to adapt the invention to special purposes, and I reserve the right to make any such changes as may be resorted to without departing from the spirit of my invention.

Having thus described my invention, what I claim is—

1. The gripping mechanism comprising the sleeve or hub having radially-extending arms, the segmental friction-leaves hinged to said arms, the projections extending outwardly from said hub and inwardly from said leaves and having grooved meeting faces, said projections being provided with transverse perforations and the convexed-face adjusting-screws, in combination with the sliding collar having the laterally-extending wedge-arms and the yokes at the outer ends of said arms, and having wedge-shaped arms engaging the perforations in the inwardly-extending projections of the friction-leaves, and guide-arms engaging the perforations in the projections of the hub or sleeve, substantially as set forth.

2. The combination of the hub or sleeve, the friction-leaves hinged to the same, the operating-arms provided with wedge-shaped faces adapted to engage recesses in projections of the hub and friction-leaves, and yokes engaging perforations in said projections, substantially as and for the purpose set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

JOSEPH C. HARTMAN.

Witnesses:

W. J. CRAWFORD,  
ALF. E. VENESS.