(No Model.) 2 Sheets—Sheet 1.

S. H. PITKIN.

FRICTION CLUTCH.

No. 388,580. Patented Aug. 28, 1888.

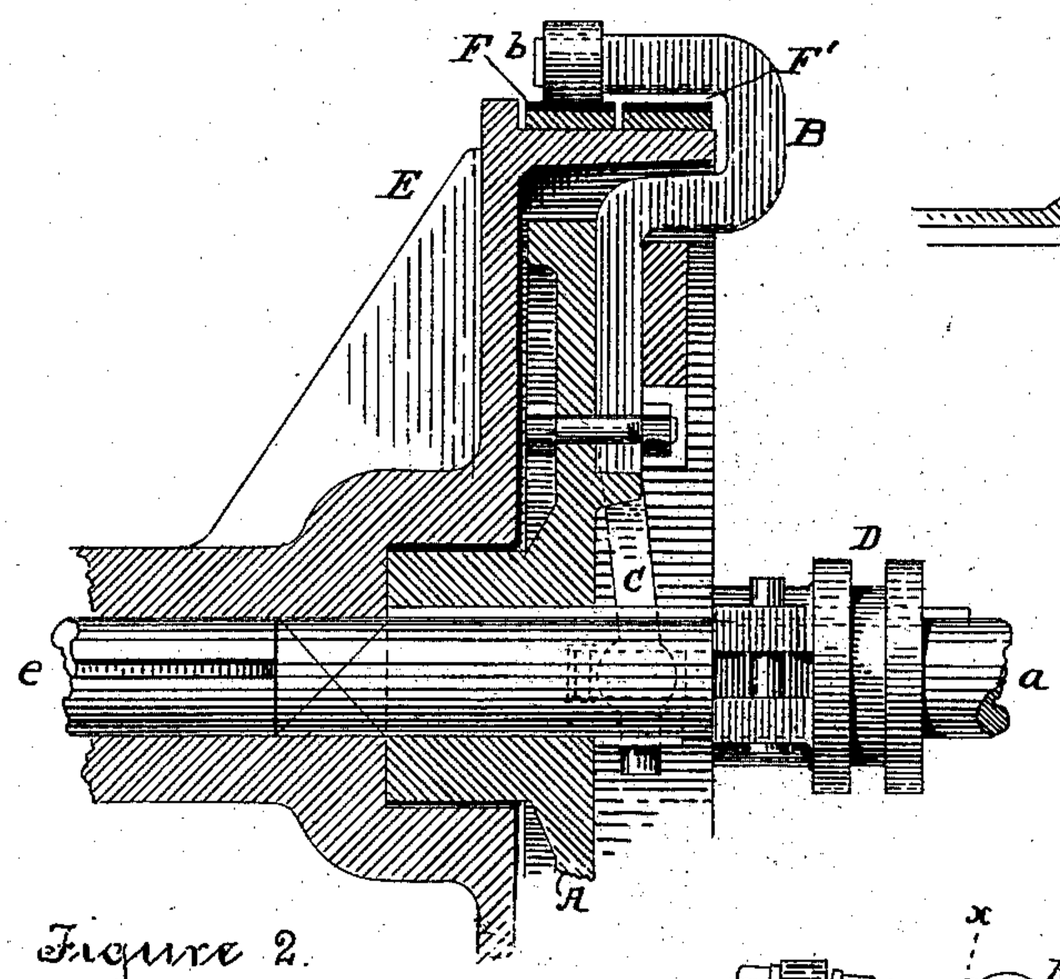

Figure 2.

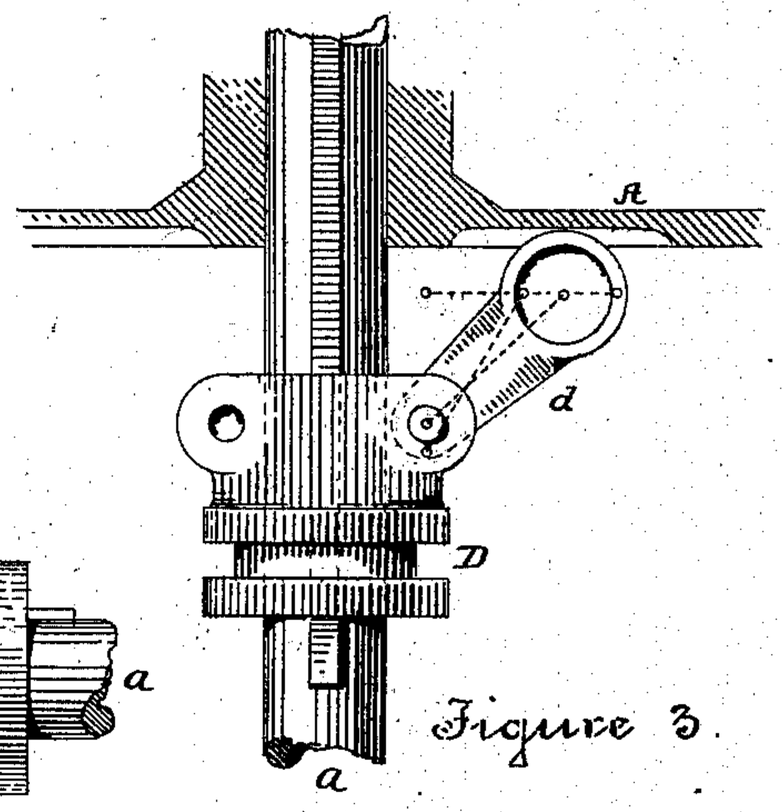

Figure 3.

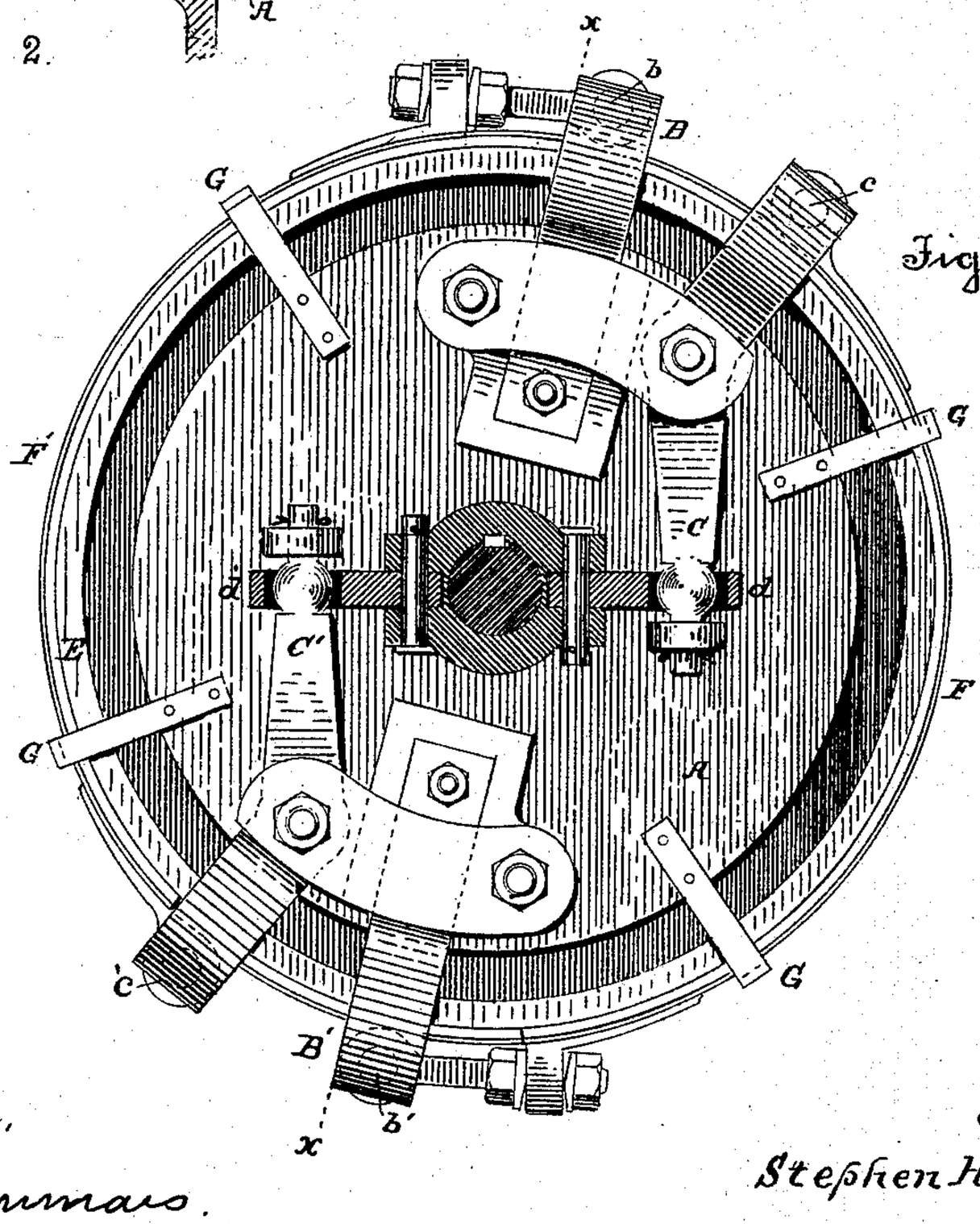

Figure 1

Witnesses,
G. H. Seymour.
F. H. Stuart.

Inventor,
Stephen H. Pitkin,
By his Attorney
C. P. Humphrey.

(No Model.) 2 Sheets—Sheet 2.

S. H. PITKIN.

FRICTION CLUTCH.

No. 388,580. Patented Aug. 28, 1888.

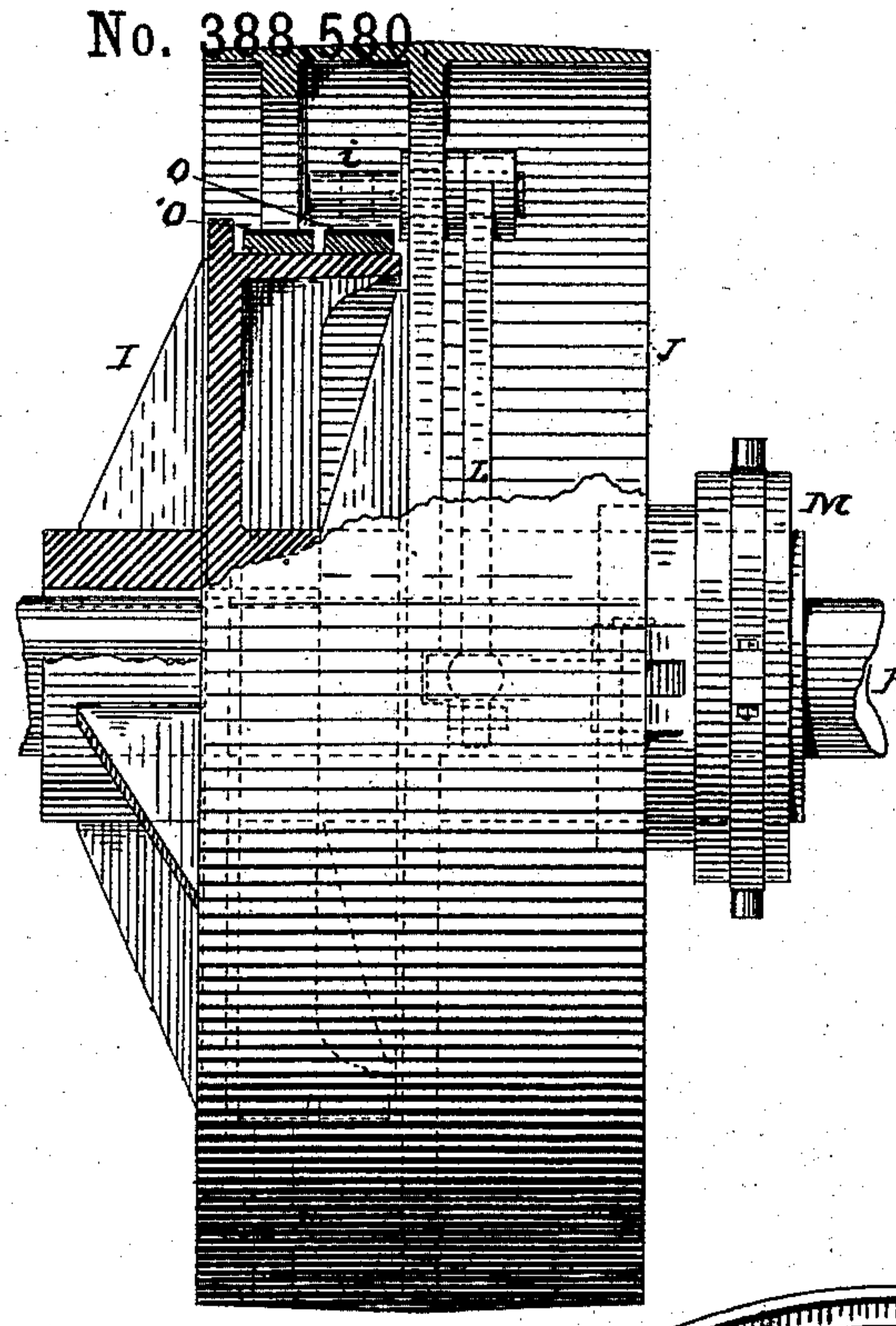

Figure 5.

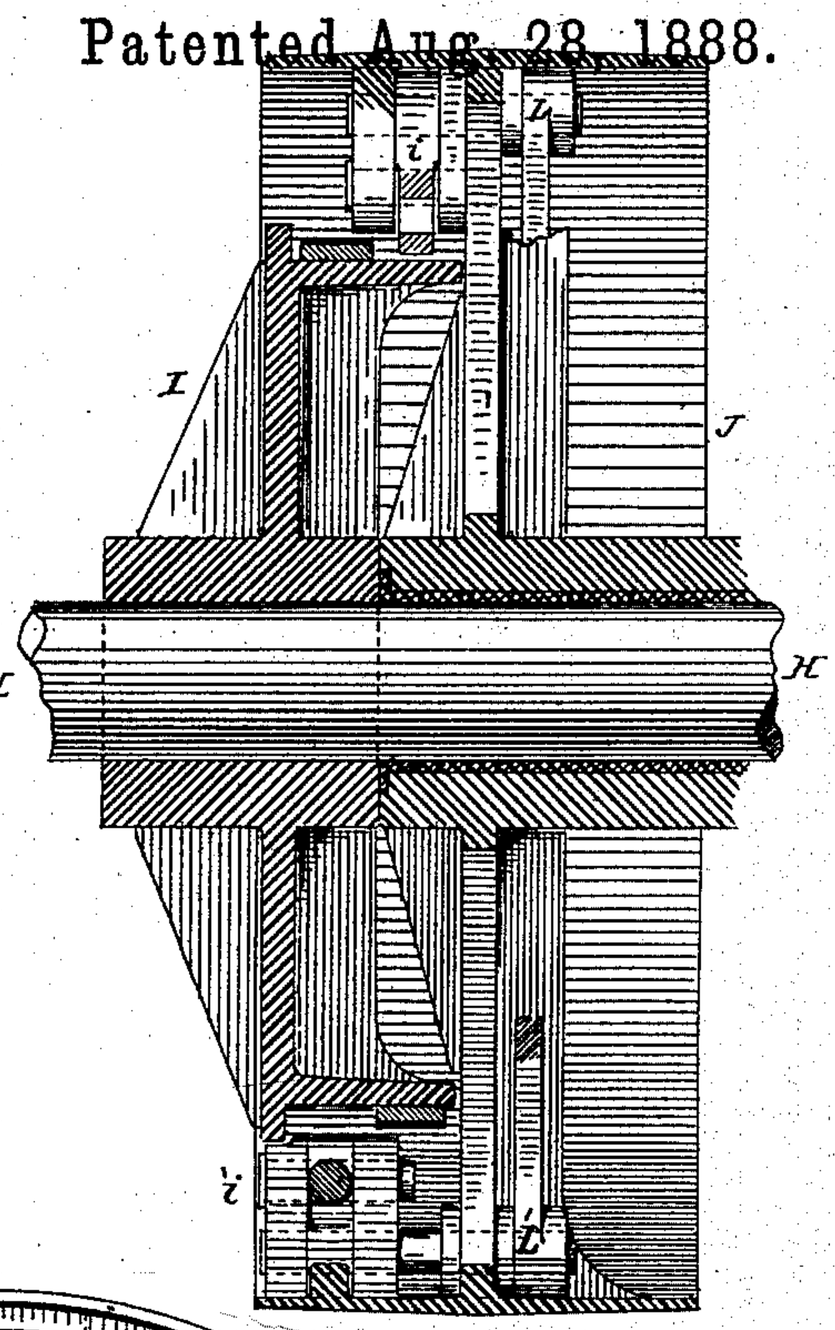

Figure 6.

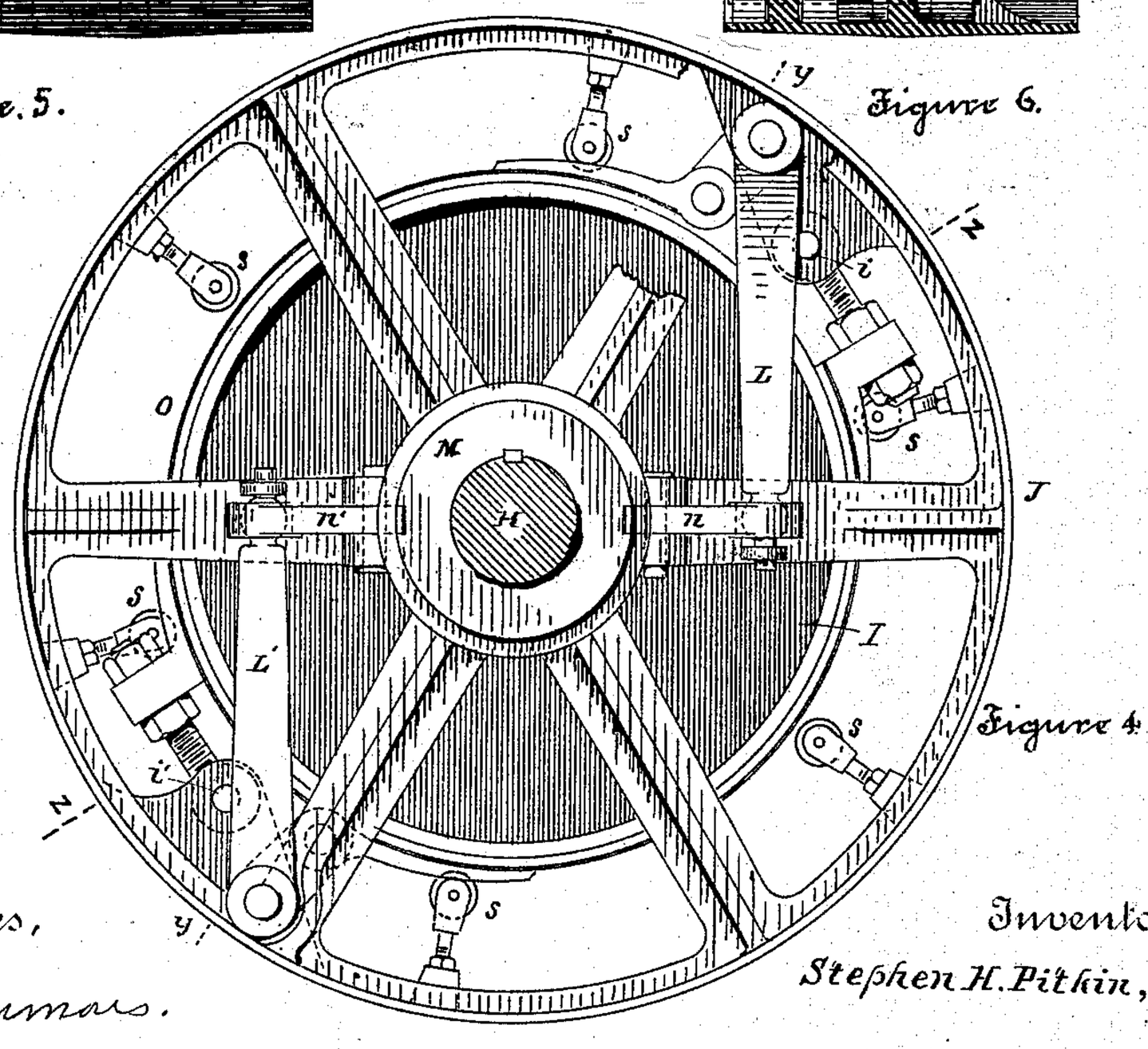

Figure 4.

Witnesses,
G. H. Simmons.
F. H. Stuart.

Inventor
Stephen H. Pitkin,
By his Attorney
C. P. Humphry.

UNITED STATES PATENT OFFICE.

STEPHEN H. PITKIN, OF AKRON, OHIO.

FRICTION-CLUTCH.

SPECIFICATION forming part of Letters Patent No. 388,580, dated August 28, 1888.

Application filed September 22, 1887. Serial No. 250,445. (No model.)

To all whom it may concern:

Be it known that I, STEPHEN H. PITKIN, a citizen of the United States, residing at Akron, in the county of Summit and State of Ohio, have invented a certain new and useful Friction-Clutch, of which the following is a specification.

My invention has relation to improvements in that class of friction-clutches in which motion is transmitted from the driving to the driven mechanism by a band connected with one of said parts, which surrounds and is arranged to be clamped upon a pulley-face connected with the other part.

The objects of my invention are to secure a maximum of driving-power from the band, to exactly counterbalance the parts in any position, and to produce a clutch adapted for line-shafting, friction-pulleys, and direct-acting mechanism where high speed is required.

My invention consists in the devices illustrated in the accompanying drawings, as hereinafter described and claimed.

In the accompanying drawings, Figure 1 is an end elevation of my improved clutch, in which the levers and wrist-pin arms are connected with a disk attached to the driving-shaft and clamp the bands on a pulley attached to a driven shaft; Fig. 2, a partial vertical central section of Fig. 1 at the line *x x;* Fig. 3, a plan of part of the driving-shaft, showing the sleeve and one of the links; Fig. 4, an end elevation of a clutch, in which the levers and wrist-pin are connected with a loose pulley and clamp the bands on a pulley keyed to the driving-shaft; Fig. 5, a side elevation and partial section of Fig. 4 at the line *y y*, and Fig. 6 a transverse section of Fig. 4 at the line *z z*.

In the construction shown in Figs. 1, 2, and 3, A is a disk keyed to the driving-shaft *a*, secured to the face of which and diametrically opposite are arms B B′, terminating in wrist-pins *b b′*, and pivoted levers C C′, also having wrist-pins *c c′*, their inner ends being connected by links *d d′* with the sliding sleeve D. I have shown the arms B B′ secured to the disk or wheel A by means of bolts *a′*, and said arms are bent into U shape at their outer extremities to partly encircle the periphery of the pulley E, and terminating in the wrist-pins *b b′*, as shown in Fig. 2. The pivoted levers C C′ are pivoted to the disk or wheel A by means of pivot-bolts *c²*, and each of said levers consists of a slightly-bent arm provided with a wrist-pin at its outer end similar to the wrist-pins *b b′*, and at its inner end has a universal bearing, *c³*, which works in a perforation in the end of one of the links, *d*. *c⁴* is a washer that is intended to prevent accidental displacement of the universal bearing; but this may be dispensed with. The links *d d′* are pivoted to the sliding sleeve D by means of pivot-pins *d² d²*, as clearly shown in Fig. 1. Concentric with the disk A is the pulley E on the driven shaft *e*, about the face of which are two parallel bands, F F′, the ends of the former being connected with the wrist-pins *b c*, the end of the band being secured to the wrist-pin *b* by means of eyebolts *f*, the eye of which engages the wrist-pin *b*, the other end of said bolt being secured to a lug, *f′*, on the end of the band by means of nuts, as shown, and the other end of the band is secured to the wrist-pin *c* by means of a perforated lug, *f²*, fastened to the end of the band, the wrist-pin *c* passing through the perforation in said lug. The ends of the band F′ are connected to the wrist-pins *b′ c′* in the manner just described. By moving the sleeve D toward the disk A the bands F F′ are simultaneously clamped on the pulley E, thereby causing the shaft *e* to rotate with the shaft *a* until by an opposite motion of the sleeve D the bands are released. By this arrangement I not only secure the power due to the greatest available length of band, but as the levers C C′ move in unison they exactly counterbalance each other in any position, and the thrust on the sleeve being the same from opposite directions friction on the shaft is avoided. This form is especially adapted to line-shafting and direct-acting mechanism. The bands F F′ are of spring-steel, nearly or quite straight in their normal position, and hence when released they are by their own tension thrown from contact with the pulley-face and rest against the stops G, which consist of flat bars fastened to the disk A and bent across and a short distance from the pulley-face.

In applying my invention to the transmission of motion to a loose pulley or drum mounted on the driving-shaft, particularly when great speed is required, I find it preferable to have the frictional pulley-face tight on the shaft, and connect the levers, arms, and

bands with the loose pulleys. Such an arrangement is shown in Figs. 4, 5, and 6, in which H is the driving-shaft, upon which are mounted a tight disk or pulley, I, and a loose pulley, J. Two bands, O O′, surround the pulley I, one end of one of said bands, O, having connected thereto a lug, *o*, through which passes an eyebolt, *o′*, and secured to the lug *o* by means of nuts, as shown, and the perforations of the eyebolt engages the wrist-pin *i*, secured to a lug, *k*, upon the inner periphery of the pulley J, and secures the band thereto. The other end of the band is secured to the wrist-pin o^2 by means of a perforated lug, o^3, fastened to the end of the band, the wrist-pin o^2 passing through the perforation in said lug. The band O is fastened in a like manner to the wrist-pins *i* and o^5.

L L′ are levers having universal bearings at their inner ends in links *n n′*, which links are pivoted to a sliding sleeve, M, and pivoted at their outer ends to lugs *k k′*, upon the inner periphery of the pulley J, by means of pivot-pins k^2 k^3, which pass through the lugs *k k′* and are secured to short arms *l l′*, which arms carry the wrist-pins o^2 o^5. The operation of this arrangement is similar to that of the other construction, hereinbefore described.

The stops *s* for the bands O O′ project from the inside of the loose-pulley rim, and are each provided with a friction-pulley, against which the bands run when out of contact with the frictional face.

I claim—

The combination of a fast and a loose pulley, one of said pulleys being provided with a flange and the other with two parallel bands which encircle said flange, two fixed arms carrying wrist-pins, two pivoted levers carrying wrist-pins, the sliding sleeve and the links connecting said sliding sleeve to the pivoted levers, the two ends of one of said bands being attached, respectively, to the wrist-pin carried by the fixed arm and the wrist-pin carried by the pivoted lever mounted on one of said pulleys, and the two ends of the other band being respectively attached to the wrist-pin carried by the fixed arm and the wrist-pin carried by the pivoted lever mounted on the same pulley, the fixed arm and pivoted lever of one band being secured to the pulley diametrically opposite the fixed arm and pivoted lever of the other band, the inner ends of said levers having universal bearings in links pivoted to the sliding sleeve on the shaft, said levers being arranged to simultaneously either draw said bands upon the pulley-flange or to release them therefrom, substantially as described.

STEPHEN H. PITKIN.

In presence of—

C. P. HUMPHREY,

G. H. SUMMER.