

(No Model.)

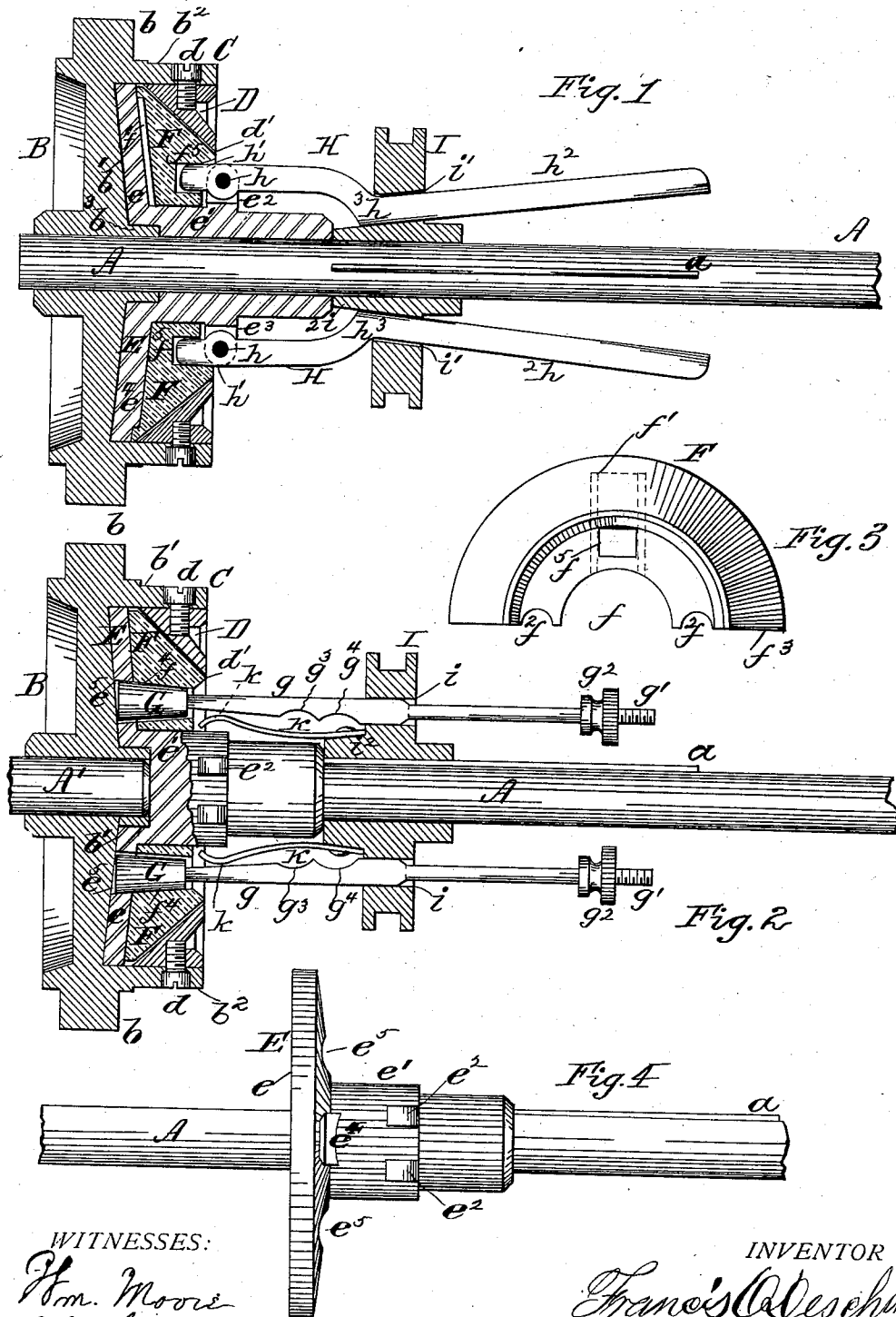
2 Sheets—Sheet 1.

F. O. DESCHAMPS.

FRICTION CLUTCH.

No. 260,460.

Patented July 4, 1882.



WITNESSES:
Hm. Moore
Chas. Jones

INVENTOR
Francis O. Deschamps

(No Model.)

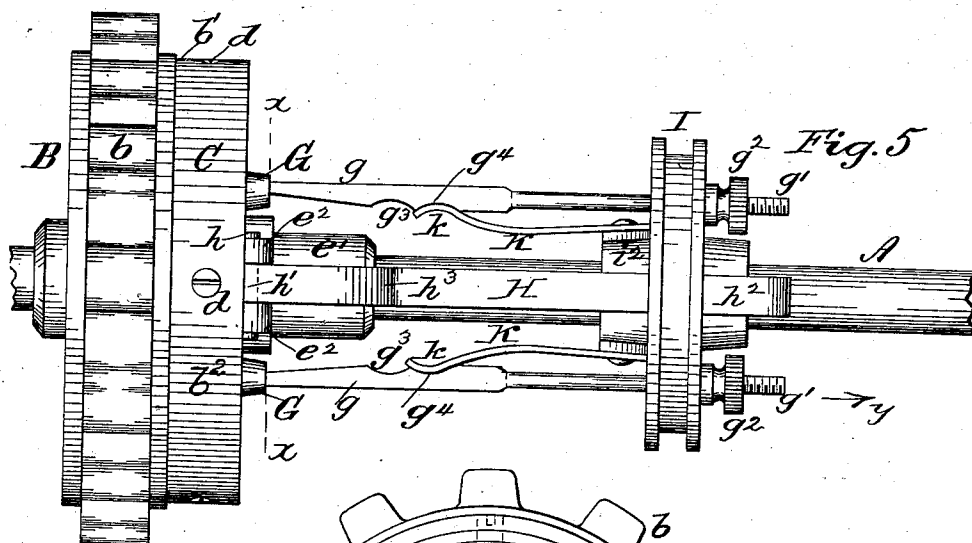
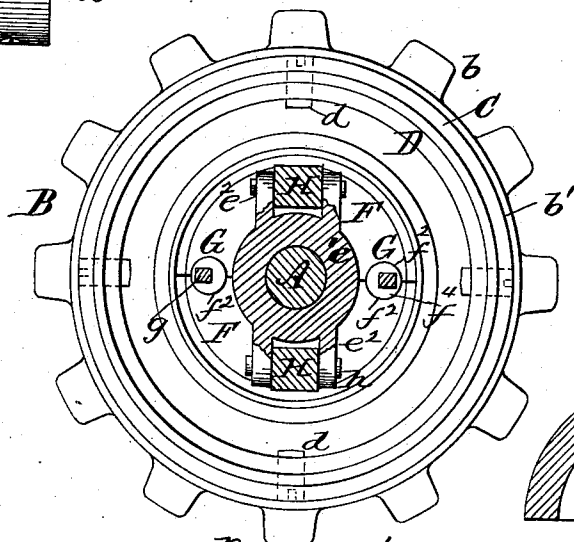
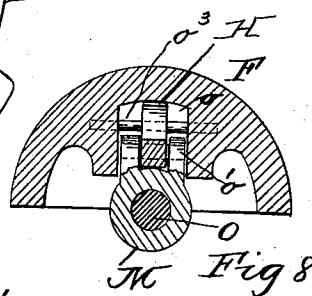
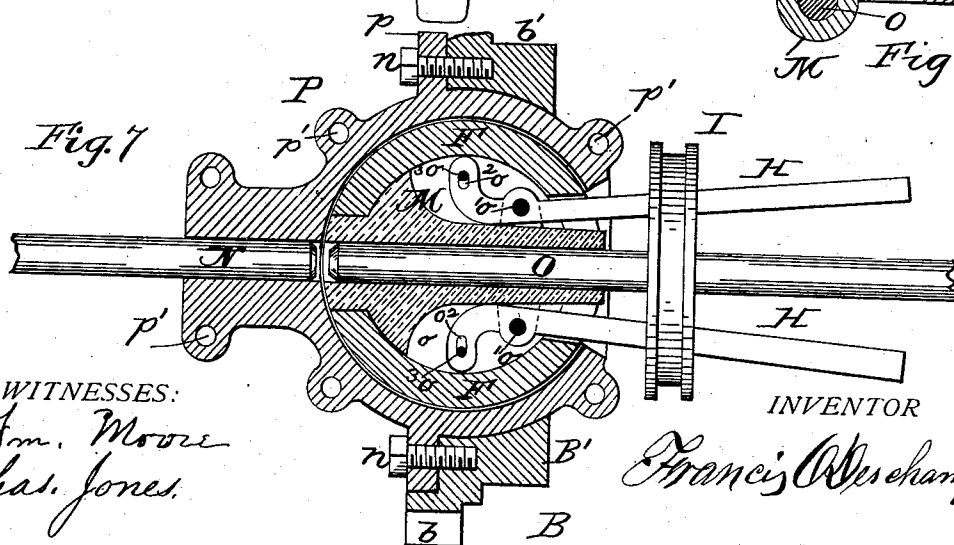
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UNITED STATES PATENT OFFICE.

FRANCIS O. DESCHAMPS, OF PHILADELPHIA, PENNSYLVANIA.

FRICTION-CLUTCH.

SPECIFICATION forming part of Letters Patent No. 260,460, dated July 4, 1882.

Application filed October 5, 1881. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS O. DESCHAMPS, a citizen of the United States, and a resident of the city and county of Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Friction-Clutches, of which the following is a specification, reference being had to the annexed drawings, wherein—

10 Figure 1 is a longitudinal vertical section of my invention. Fig. 2 is a horizontal section of the same. Fig. 3 is a front elevation of one of the movable friction-shoes. Fig. 4 is a plan of shaft with attached disk and component parts. Fig. 5 is a plan of my improved friction-clutch or coupler. Fig. 6 is a transverse vertical section on line *x x*, Fig. 5. Fig. 7 is a longitudinal vertical section of a modification of the friction-clutch or coupler, and Fig. 8 is
15 a detail transverse section of the same.

My invention relates to friction-clutches, and has for its object to so construct such devices that they are adapted for use as friction-clutches or as couplers for connecting and disconnecting the adjacent ends of two aligning shafts.

My invention accordingly consists of the combination, construction, and arrangement of parts hereinafter described and claimed.

30 Referring to the accompanying drawings, A represents a shaft, and B the clutch-pulley, loosely mounted thereon, so as to revolve on said shaft when free to do so. Said pulley is provided with spurs or teeth *b* for the reception of a chain belting when it is desired to use
35 the same.

C represents an annular flange projecting from the side *b'* of said pulley. The exterior face, *b²*, of said flange is designed to receive a
40 leather or other belt for driving the pulley B. Such construction of said pulley permits of the use either of a driving chain or belt singly, or, if desired, they may both be employed simultaneously, such use depending upon the local conditions and the nature of the mechanism to which the clutch is designed to be applied.

45 *b³* represents a hub formed on pulley B, and from its base the side *b'* of said pulley is inclined until said side meets the internal periphery of the flange C, thereby providing a
50 conical side for said pulley.

D is a ring fitting snugly within the flange C, and is retained therein by screws *d d*. The internal periphery, *d'*, of said ring is made conical or inclining in outline, with its largest diameter toward the pulley side *b'*. 55

E represents a disk formed on or secured in any suitable manner to shaft A. The side *e* of said disk is hollowed out to conform to the degree of inclination of the pulley side *b'*, so that the latter and said side *e* will contact with each other throughout their entire opposing surfaces when caused to do so. The disk E is provided with a hub, *e'*, upon which are formed lugs *e² e³*, placed diametrically opposite each other, as shown. 60 65

F F designate the movable friction-clutch or coupling shoes, each one of which consists of a semicircular segment recessed at *f* to pass over the hub *e'* of disk E, and have dovetail or plain slots *f'*, into which pass tongues *e⁴*, formed on disk E. Said tongues act as guides for the shoes or segments F F to move upon. 70

f² f² are inclining recesses, formed on the diametric sides *f³ f³* of the segments or shoes, so that when the latter are placed in position the respective recesses *f² f²* in said shoes or segments will then register with each other to form conical-shaped openings *f⁴ f⁴*. In line with said openings are similarly-shaped apertures in disk E, as shown at *e⁵ e⁵*. 75 80

G G indicate cones placed within the openings *f⁴ e⁵*, and are each provided with a rod, *g*, projecting therefrom in line parallel with shaft A, their ends *g' g'* being threaded to receive the adjusting-nuts *g² g²*, as illustrated. *g³ g⁴* are curved recesses or notches formed on rods *g g*, as shown. 85

H H are levers pivoted at *h* in the lugs *e² e³* on hub *e'*. The short arms, *h'*, of said levers enter openings *f⁵* in shoes or segments F F, while their long arms, *h²*, from their contracted portions *h³*, flare outwardly from the shaft A, as indicated. 90

I is the usual operating or sliding collar on shaft A, and *a* is a feather thereon for said collar. The latter is formed with openings *i i* for the passage therethrough of rods *g g*, and with inclining openings *i' i'*, through which pass the ends *h² h²* of the levers H H. 95 100

On the hub *i²* of collar I are riveted or otherwise secured thereto two springs, K K, in line

with the rods $g g$, so that as said collar is moved on shaft A the curved ends $k k$ of said springs will pass successively into and out of the recesses $g^3 g^4$ in said rods.

5 The operation is as follows: Said parts being arranged in position, as shown in Figs. 1 and 2, the clutching or coupling shoes F F are not in engagement with pulley B, and the latter is free to revolve under the influence of a driving chain or belt, as desired. If at any time it is deemed necessary to slow down or limit the speed of the revolution of said pulley, the collar I is caused to slide in the direction indicated by arrow y , Fig. 5, by means of the usual or any desired form of operating-handle swiveled to collar I in the customary manner. As the collar I moves, its inclining openings $i' i'$ draw the flaring lever ends $h^2 h^2$ together. Consequently the short arms $h' h'$ of the levers H H spread the shoes F F apart. The springs K K, moving with collar I, have their ends $k k$ passed into the recesses $g^3 g^3$ in rods $g g$, and cause the latter to be moved in direction of said arrow y until the cones G G contact with the sides of the openings f^4 in shoes F F, whereupon said movement of collar I is suspended, and, owing to the spreading apart of said shoes by levers H H and cones G G, said shoes are in frictional contact with the side d' or inner periphery of ring D, and thereby effecting therewith a slight or limited clutch-connection, which results in decreasing the speed of rotation of the pulley B. Such position of the clutch or coupling shoes is maintained by means of the automatic lock effected by the ends $k k$ of springs K K remaining in the recesses g^3 of rods or bars $g g$. A further movement of collar I draws the lever ends $h^2 h^2$ still closer together, and the ends $h' h'$ spread the shoes F F still farther apart, while the springs K K disengage themselves from recesses g^3 to pass into recesses g^4 , to further move the cones G in the direction of said arrow y to compensate for the additional spreading apart of the shoes. Such movement is continued until collar I abuts against the adjusting-nuts g^2 on rods g . The spring ends $k k$, remaining in recesses g^4 , as shown in Fig. 5, automatically lock the parts in such described position. The shoes F then bind tightly against ring D at all points on its inclined surface d' , whereupon, owing to such inclination, the shoes F meanwhile have operated to draw or move the pulley B slightly forward in direction indicated by said arrow y , to cause its conical side b' to impinge or frictionally engage with the opposing side e of disk E, thus obtaining two surfaces for frictional engagement of the clutch or coupling devices, thereby resulting in the formation of a very powerful clutch. To release the clutch or coupling connection, the collar I is simply reversely moved until it arrives at the contracted parts h^3 of levers H H.

65 It will be noticed that the wheel B is not held in place on shaft A by means of collars

or screws passing into an annular slot in said shaft, as has heretofore been the usual manner of holding the clutch-pulley on its shaft, such pulley in my case being retained in position by means of the disk E and shoes F F acting in conjunction with the ring D, secured to said pulley, as shown.

As the impinging and bearing surfaces of the clutch wear, the nuts $g^2 g^2$ are adjusted to compensate therefor. When the pulley B and coupling or clutching mechanism are all placed upon one and the same shaft a friction-clutch only is produced; but when the pulley is secured to one and the coupling or clutching devices secured to the other of two aligning shafts, as shown at A A' in Fig. 2, a shaft coupler and clutch is effected.

In Fig. 7 I have shown a slight modification in construction of my invention, wherein the pulley B consists of a ring, B', having the teeth b and plane surface b' formed thereon, as shown, and which is secured by screws $n n$ to a flange, p , on spheroidal shell P. The latter consists of two halves designed to be bolted together at $p' p'$, and is rigidly secured to shaft N. The shoes F F are semi-spherical in outline to fit in a globular chamber within shell P. They are each formed with slots $o o$, into which pass the small ends of levers H. The latter are pivoted at $o' o'$ to a sleeve, M, firmly secured to shaft O, and are provided with slots $o^2 o^2$, through which pass pins $o^3 o^3$, journaled or secured in shoes F, as shown more plainly in Fig. 8.

When collar I is in position shown in Fig. 7 the shoes F F are not in engagement with shell P; hence shaft O revolves independently of shaft N. But when said collar is moved to the right the levers H are drawn together, whereupon their short ends or arms spread the shoes apart to cause them to frictionally engage with spherical shell P, whereupon both shafts N O revolve together. If desired, the ring B' may be dispensed with, in which case the device acts only as a shaft-coupler.

What I claim as my invention is—

1. A clutching clamp or coupling pulley, B, provided with teeth b , designed to receive a driving-chain, and formed with an annular flange, C, having an exterior smooth or unbroken periphery adapted to receive a driving-belt, whereby said pulley may be driven by a belt or chain, substantially as set forth.

2. The clutch-pulley B, provided with a ring, D, having inner conical periphery, d' , in combination with clutching or coupling mechanism, substantially as shown and described.

3. In a friction-clutch or coupler, the combination of the following elements, viz: a clutch-pulley having a conical side and an attached ring, a disk secured rigidly to the pulley-shaft and provided with movable clutching-shoes, and mechanism for operating said shoes, substantially as shown and described.

4. The combination of pulley B, ring D, disk E, having hub e' , with attached shoes F and levers H, the cones G, with recessed rods g ,

and collar I, provided with springs K K, substantially as shown and described.

5 5. In a friction or coupling clutch, the combination, with a pulley provided with clutch mechanism from which project notched arms, of a sliding collar having springs thereon, the ends of which are designed and adapted to connect with said notched arms to form an automatic lock, substantially as shown and
10 set forth.

6. In combination with pulley B, the disk E, ring D, shoes F, cones G, having arms g g , provided with adjusting-nuts g^2 g^2 , and collar I, substantially as set forth.

15 7. In a friction-clutch or coupler, the combination of the following elements, viz: a clutch or coupling pulley and a disk or sleeve rigidly secured to the driving-shaft, said disk being contained in a chamber or recess formed in

said pulley, and having shoes secured there- 20 to, which are provided with mechanism, substantially as shown and described, to move said shoes radially and cause them to contact with the wall or walls of said chamber or recess to retain said pulley in position on its 25 shaft, and to form a clutch therefor, substantially as shown and set forth.

8. The shoes F, having slots f' f^s and conical recesses f^2 , substantially as and for the purpose set forth.

In testimony that I claim the foregoing I 30 have hereunto set my hand this 30th day of September, 1881.

FRANCIS O. DESCHAMPS.

Witnesses:

J. DANIEL EBY,
VAN WYCK BUDD.