(No Model.)

C. HERMANN.

FRICTION CLUTCH.

No. 454,435. Patented June 16, 1891.

Fig. 1.

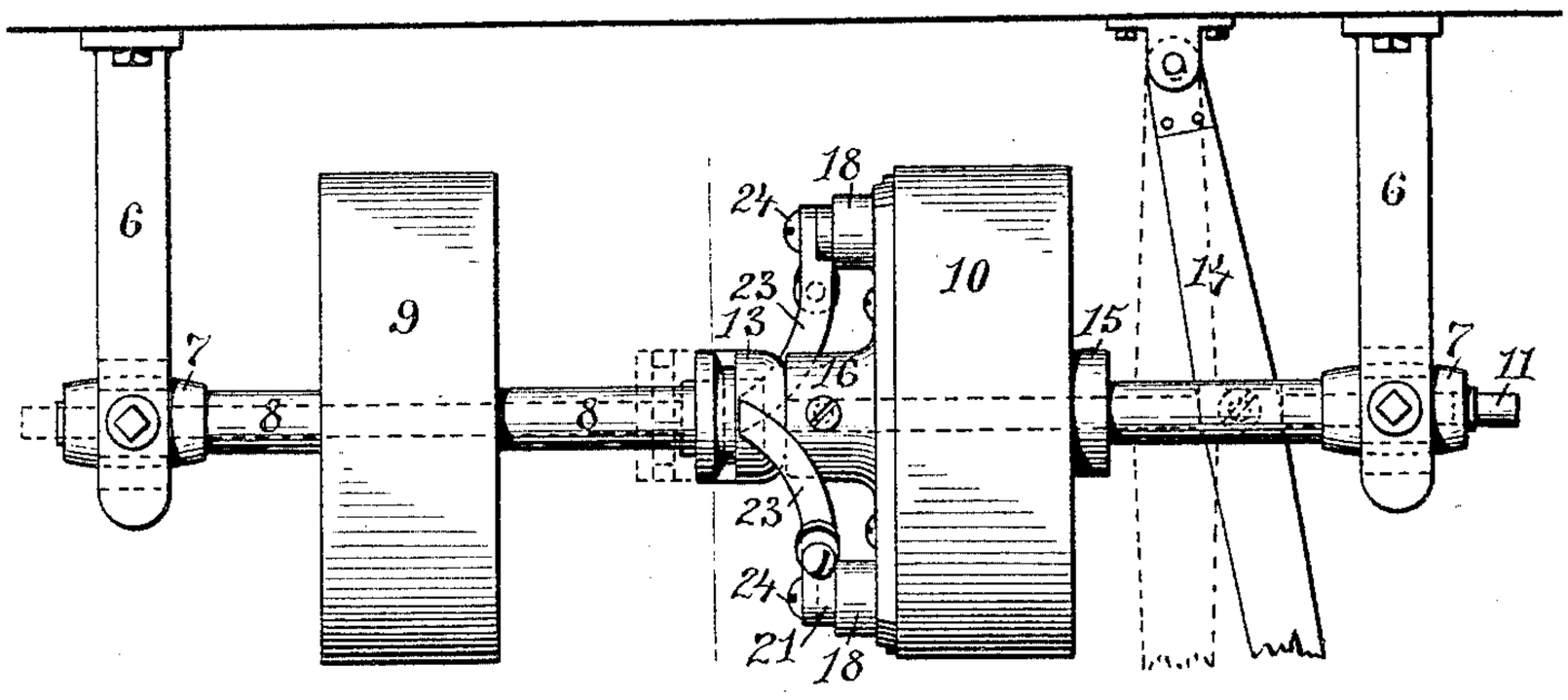
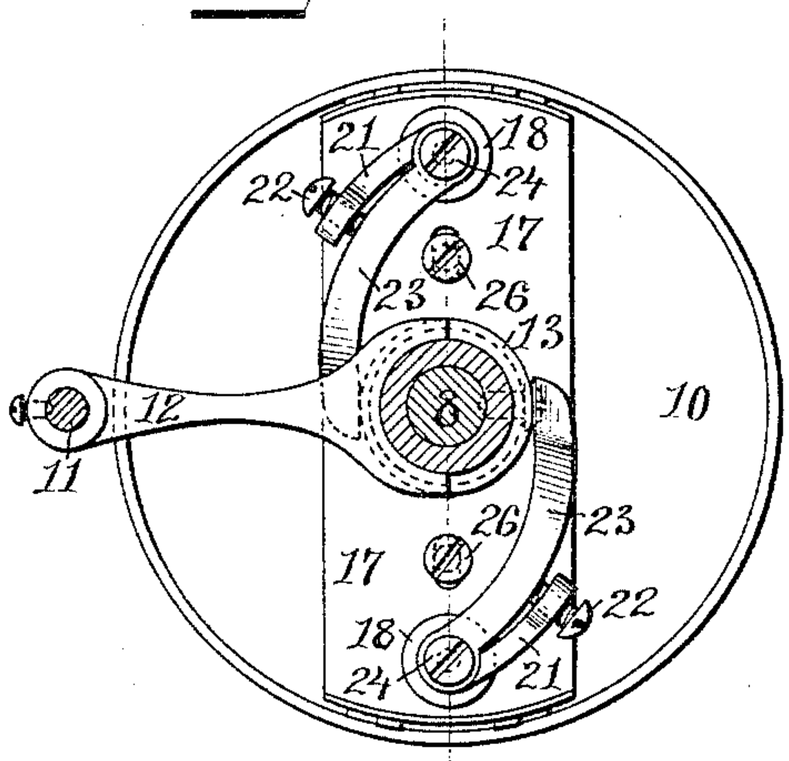


Fig. 2.

Fig. 3.



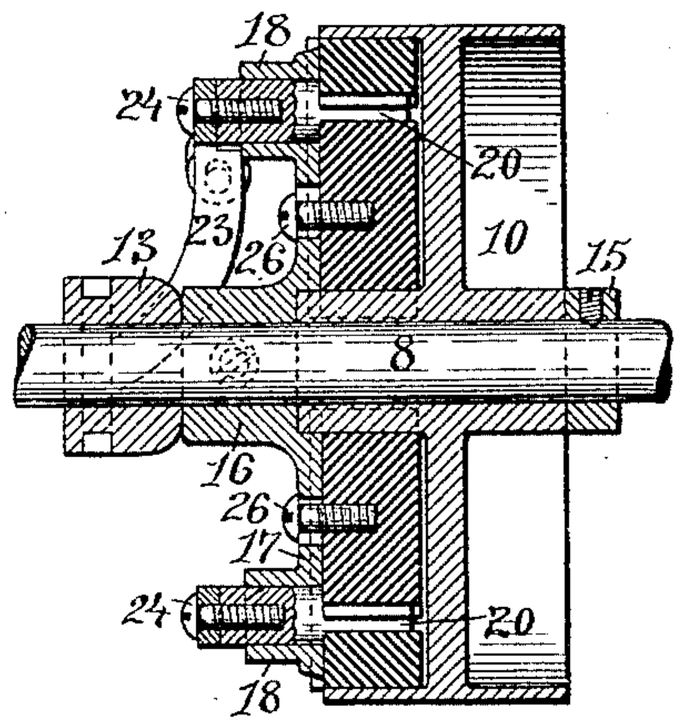


Fig. 4.

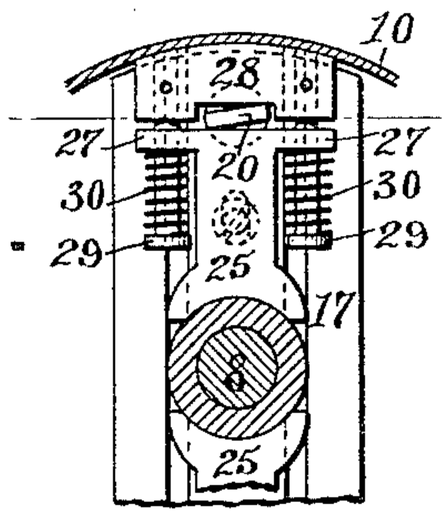
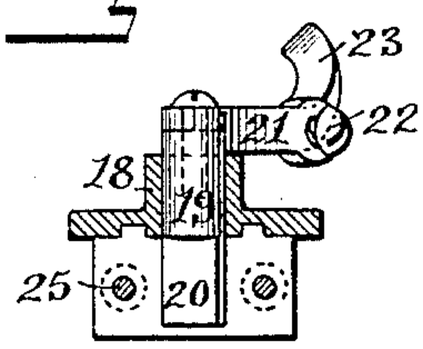


Fig. 5.



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UNITED STATES PATENT OFFICE.

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FRICTION-CLUTCH.

SPECIFICATION forming part of Letters Patent No. 454,435, dated June 16, 1891.

Application filed October 8, 1890. Serial No. 367,405. (No model.)

To all whom it may concern:

Be it known that I, CHRISTIAN HERMANN, of Bristol, in the county of Bristol and State of Rhode Island, have invented a new and useful Improvement in Friction-Clutches; and I hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification.

This invention has reference to an improvement in the construction of a frictional clutch by which a loose pulley is connected with or disconnected from the driving-shaft; and it consists in the peculiar and novel construction of the clutch and the device for operating the same, as will be more fully set forth hereinafter.

Figure 1 is a side view showing a driving-shaft supported in hangers provided with a driving-pulley, a loose pulley, and the friction-clutch in connection with the loose pulley. Fig. 2 is an end view of the loose pulley showing the friction-clutch and the connection with the shipper-rod. Fig. 3 is a vertical cross-section through the center of the loose pulley and the friction-clutch. Fig. 4 is an enlarged end view of one end of the friction-clutch, and Fig. 5 is an enlarged side view of one of the clutch-operating arms.

Similar numbers of reference indicate corresponding parts in all the figures.

In the drawings, the numbers 6 indicate the hangers and 7 the journal-boxes, in which the shaft 8 is supported, and 9 a driving-pulley secured to and rotating with the shaft 8.

10 is a band-pulley loose on the shaft 8, and 11 the shipper-rod placed on one side of and parallel with the shaft 8 outside the loose pulley 10. To the shipper-rod 11 the arm 12 is secured. This arm is bifurcated at its outer end and engages with the clutch-operating block 13 by entering into a groove formed in the block 13. The shipper-lever 14, pivotally supported at its upper end, is connected with the shipper-rod and extends down within convenient reach of the operator. By moving the shipper-lever 14 the clutch-operating block 13, which is loose on the shaft 8, is moved laterally toward or from the loose pulley 10, as is indicated in solid and broken lines in Fig. 1. The loose pulley 10 is held against lateral movement on the shaft 8 by the collar 15, secured to the shaft 8 by a set-screw on one side, and the boss 16, secured to the shaft 8 and provided with the plate 17 extending across the end of the pulley 10 on the opposite side. The plate 17 is provided near the outer ends with the bosses 18, in which the operating-cams 19 have their bearing. The cams consist of a cylindrical spindle, the inner end of which is formed into the flattened plate 20. The cylindrical portion has its bearing in the bosses 18, and is provided with the arm 21, in the outer end of which the adjusting-screw 22 is threaded. The arms 23 are secured to the outer ends of the cylindrical part of the operating-cams 19 by means of the screws 24, on which screws the arms 23 are pivoted, so that their position relative to the arms 21 and the cam-plates 20 can be adjusted by means of the screws 22. The inward-projecting ends of the arms 23 bear on the curved or tapering end of the operating-block 13. The inner side of the plate 17 on each of the two opposite ends is provided with the thrust-blocks 25, sliding in suitable grooves, as indicated in Figs. 4 and 5, and secured to the plate 17 by the screws 26, extending through short slots formed in the plate 17. The inner ends of the thrust-blocks 25 are concaved to fit the hub of the loose pulley 10, and the outer ends are provided with the projections 27. The friction-blocks 28 have the bolts 29 extending through holes in the projections 27 of the thrust-blocks secured to them. The spiral springs 30 surround the bolts 29 and bear against the projections 27 and the heads on the inner ends of the bolts. The cam-plate 20 extends between the thrust-block 25 and the friction-block 28, as is shown in Figs. 3 and 4. The springs 30 hold the thrust-block 25 and the friction-block 28 against the cam-plate 20, and these blocks are separated by the partial turning of the cam.

The operation of the device is as follows: When the pulley 10 is loose on the shaft 8 and the shaft is turning independent of the pulley, the shipper-lever 14 and the clutch-operating block 13 are in the position indicated in broken lines in Fig. 1. In this position the cam-plates 20 are parallel with and

bearing flat against the adjacent ends of the friction-block 28 and the thrust-block 25, both blocks being drawn against the cam-plate 20 and away from the inner surface of the rim of the loose pulley 10 and the outer surface of the hub of the pulley. When now the pulley 10 is to be connected with and made to turn with the shaft 8, the shipper-lever is moved into the position shown in solid lines in Fig. 1. By this motion the shipper-rod 11 and the arm 12 will slide the operating-block 13 into the position shown in solid lines in Figs. 1 and 3. The inner ends of the arms 23 are forced outward by the enlargement of the diameter of the part of the operating-block 13 on which the arms bear, owing to the curved or tapering end of the operating-block. The arms 23, bearing against the adjusting-screws 22, move the arm 21 and turn the cam 19. The plates 20 thus separate the friction-block and the thrust-block on opposite sides of the plate 17 and force the thrust-block firmly against the hub of the pulley 10 and the friction-block against the inner surface of the rim of the pulley 10, thus connecting the pulley 10 with the plate 17 and causing the pulley to turn with the plate 17 and with the shaft 8, and, if the pulley 10 is connected with a machine by a belt, transmitting the motion from the shaft to the machine. By moving the shipper-lever 14 again into the position indicated in broken lines in Fig. 1 the operating-block is moved into the position indicated in broken lines and the pulley 10 disconnected by the partial rotation of the cam-plates and the resilient strain of the springs 30.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a friction-clutch, the combination, with a loose pulley and the plate 17, provided with a boss secured to the driving-shaft, of the thrust-blocks 25, having capacity to slide on the plate 17 and constructed to bear on the pulley-hub, the friction-blocks 28, the bolts 29 and springs 30, the cams 19, and mechanism, substantially as described, for operating the cams.

2. The combination, with the shaft 8, the loose pulley 10, and the plate 17, provided with a boss secured to the shaft, of the thrust-blocks 25, the friction-blocks 28, the cams 19, the bolts 29 and springs 30, the arms 21, forming part of the cylindrical portion of the cam and provided with the adjusting-screws 22, the arms 23, the operating-block 13, and the shipper mechanism for sliding the operating-block, as described.

3. The combination, with the shaft 8, the pulley 10, the shipper-rod, and arm 12, secured to the shipper-rod, of the operating-block 13, the arms 23, pivotally secured to the spindles of the cams 19, the arms 21, provided with the adjusting-screws 22, the cam-plates 20, the friction-blocks 28, and thrust-blocks 25, constructed to connect the pulley with the shaft by frictional contact with the boss and rim, as described.

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