No. 690,583. Patented Jan. 7, 1902.

G. S. & J. J. HUFF.

AUTOMATIC CLUTCH.

(Application filed Mar. 18, 1901.)

(No Model.) 2 Sheets—Sheet 1.

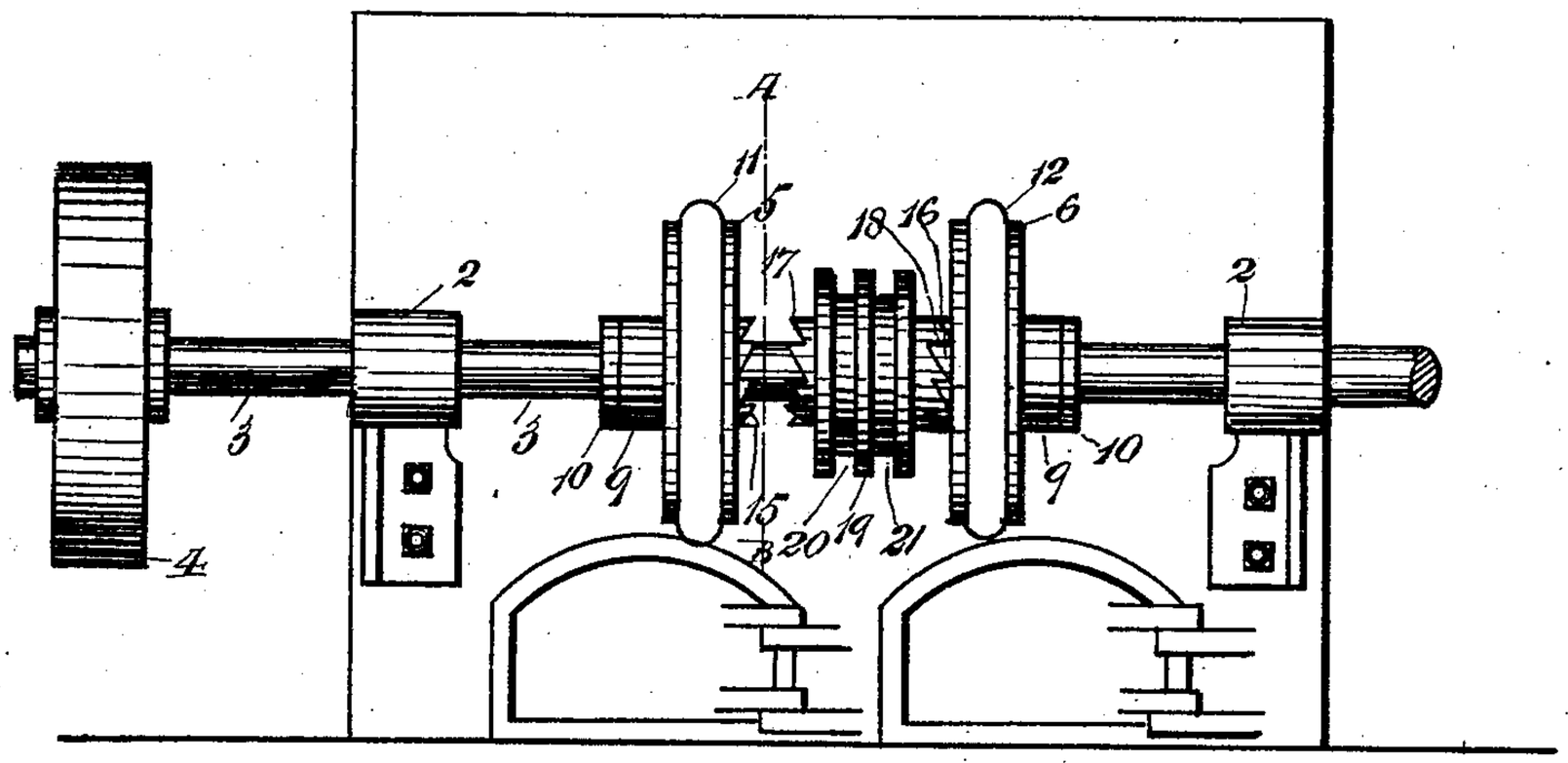

Fig 1

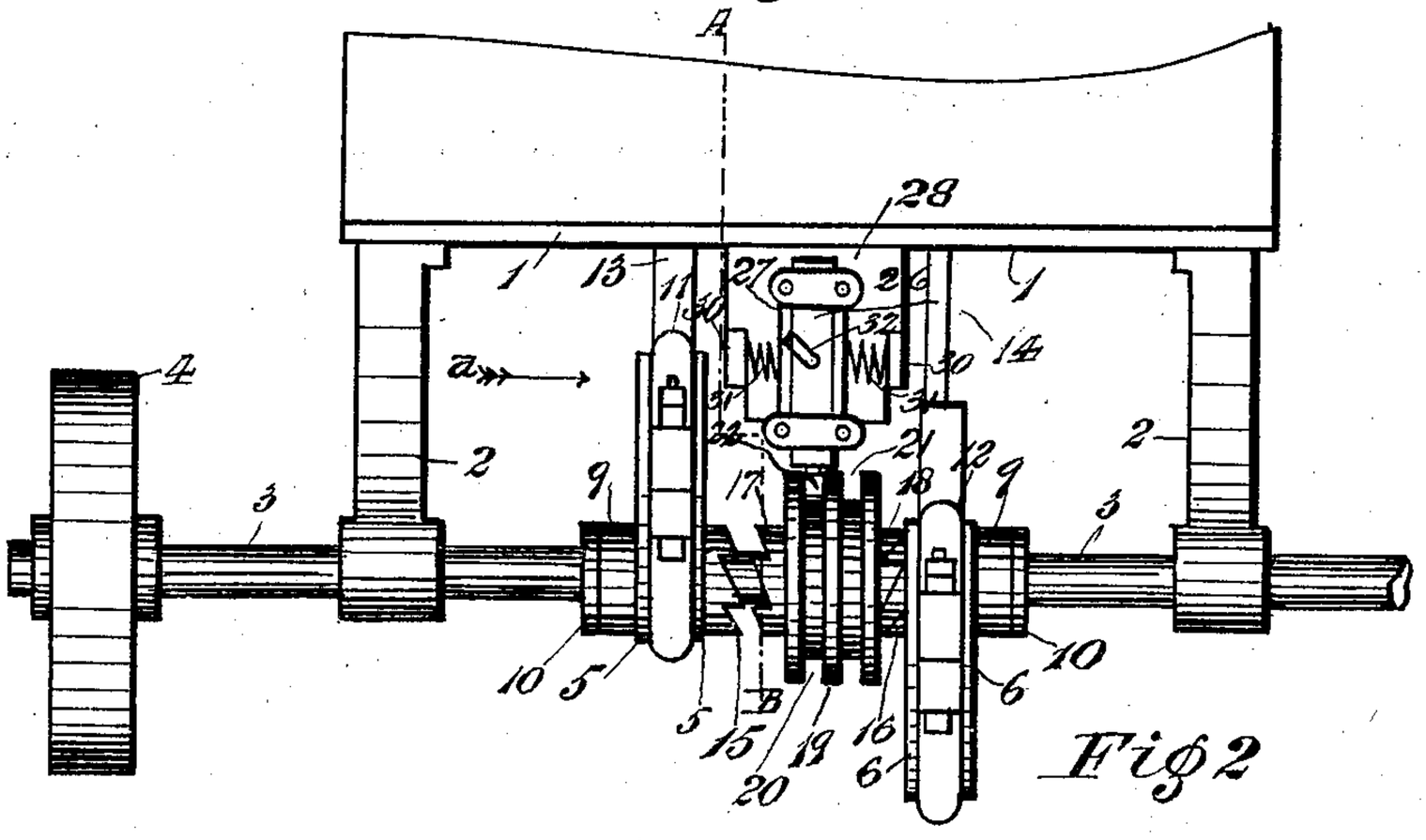

Fig 2

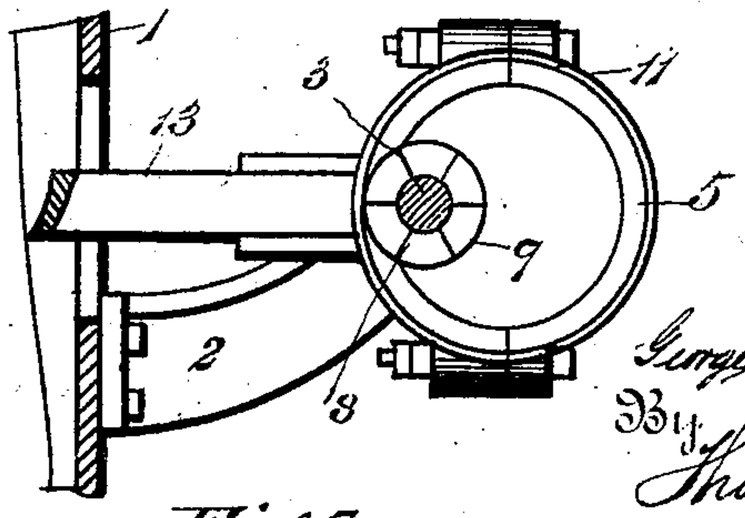

Fig 3

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2 Sheets—Sheet 2.

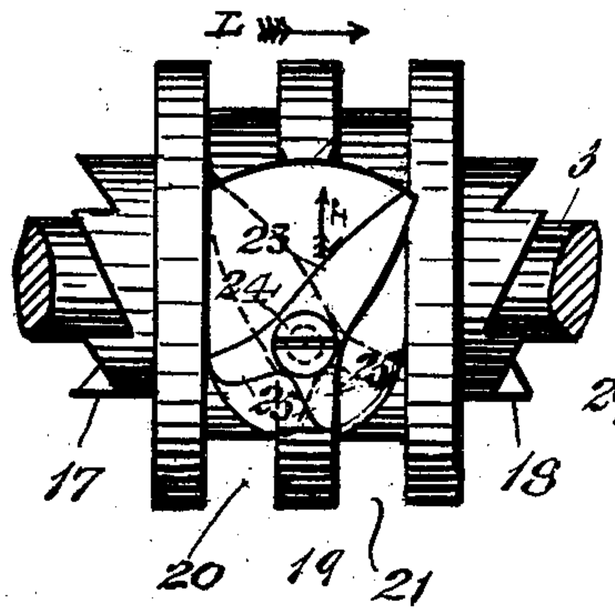


Fig 6

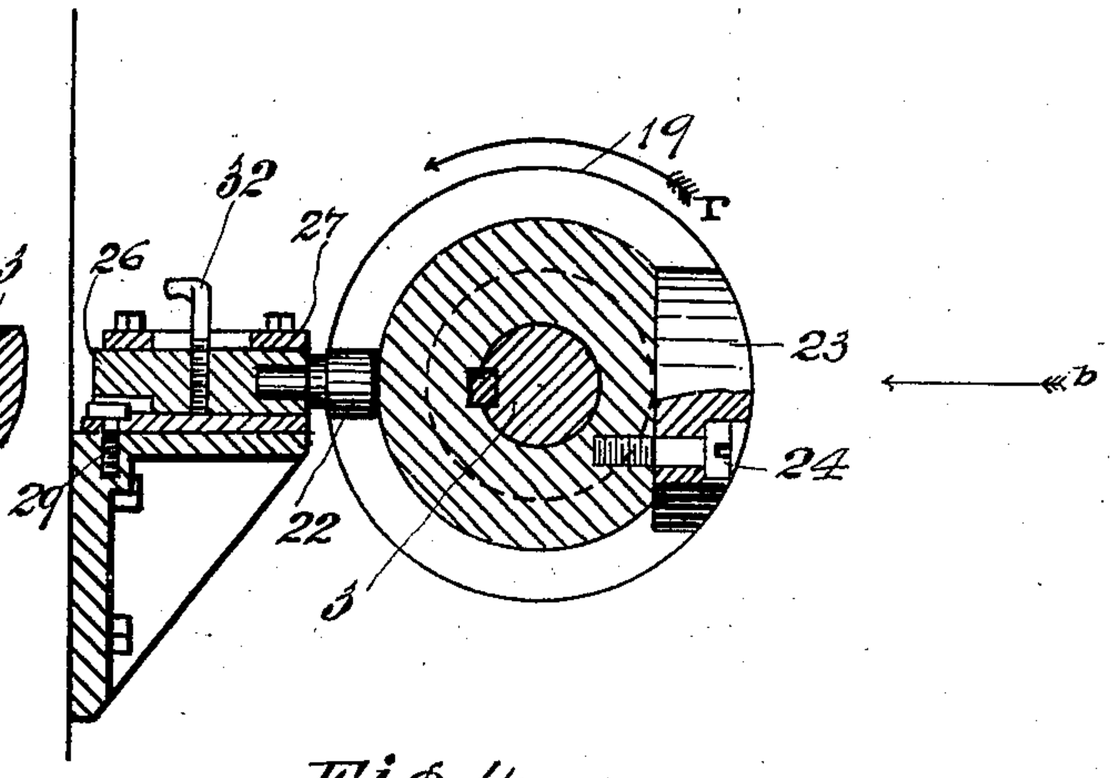


Fig 4

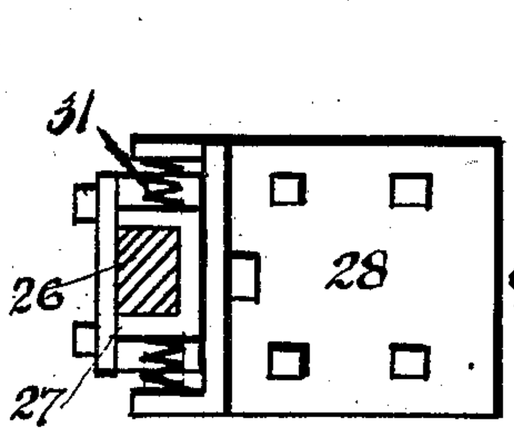


Fig 7

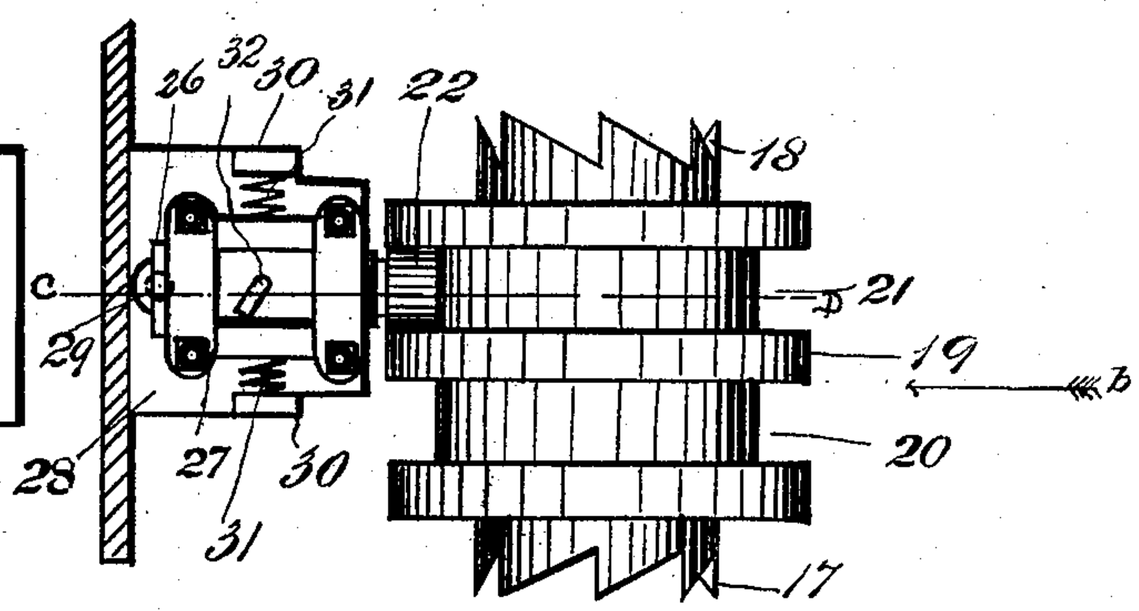
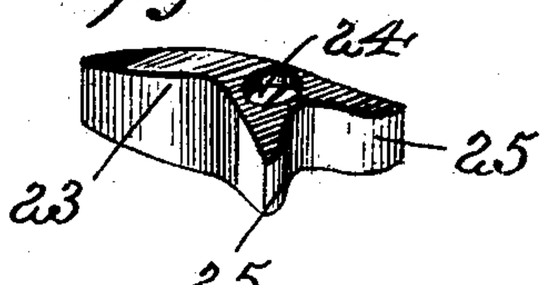


Fig 5

Fig. 8.



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UNITED STATES PATENT OFFICE.

GEORGE S. HUFF AND JAKE J. HUFF, OF INDIANAPOLIS, INDIANA, ASSIGNORS OF TWO-FIFTHS TO FRANK H. EWERS AND JOSEPH M. BERAUER, OF INDIANAPOLIS, INDIANA.

AUTOMATIC CLUTCH.

SPECIFICATION forming part of Letters Patent No. 690,583, dated January 7, 1902.

Application filed March 18, 1901. Serial No. 51,808. (No model.)

To all whom it may concern:

Be it known that we, GEORGE S. HUFF and JAKE J. HUFF, citizens of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented new and useful Improvements in Automatic Clutches, of which the following is a specification.

Our invention relates to certain new and useful improvements in clutch mechanism and the means whereby said clutch mechanism is automatically operated to be alternately moved into and out of engagement with its clutch members, as will be hereinafter more fully set forth, and particularly pointed out in the claims.

The object of this invention is particularly to provide a means whereby a main driving clutch member will be automatically operated to be alternately shifted into and out of engagement with its driven clutch member or members, and thereby obtain alternate periods of rest and operation of the mechanism connected to the driven clutch member or secondary piece. We attain these objects by means of the mechanism illustrated in the accompanying drawings, in which similar numerals of reference designate like parts throughout the several views.

Figure 1 is a front elevational view of the mechanism. Fig. 2 is a plan view of the same. Fig. 3 is a broken off sectional side view of the same, taken through the line A B (see Figs. 1 and 2) and looking in the direction of the arrow *a*. Fig. 4 is an enlarged detail sectional view of the automatic shifting or driving clutch member and taken through the line C D. (See Fig. 5.) Fig. 5 is an enlarged plan view of the same. Fig. 6 is an enlarged detail view of the same, showing the throw-out switch thereof. Fig. 7 is a front enlarged detail view of the supporting-bracket of the latch-case of the switch-pin looking in the direction of the arrow *b*, (see Figs. 4 and 5,) and Fig. 8 is a detail perspective view of the switch-bar.

Referring to the drawings, 1 designates the furnace-front, to which are secured the shaft-bearings 2. The driving-shaft 3 is mounted in the bearings 2, wherein it rotates, and is provided with a driving means, as the belt-pulley 4, which may be connected by a belt to a line-shaft, motor, or other suitable driving means. The eccentrics 5 and 6 are loosely mounted on the shaft 3, so that when not engaged by the driving clutch member 19 they will remain at rest, while the driving-shaft 3 is rotating.

On the shaft 3 are the fixed collars 8, which freely fit the counterbores formed in the hubs 9, and secured to the said hubs are the retaining-caps 10, which inclose said shaft-collars within said counterbored hubs 9, and by this means said eccentrics are maintained in their relative positions on said driving-shaft 3 and are effectually prevented from moving longitudinally thereon.

Each of the eccentrics 5 and 6 is provided with the eccentric-straps 11 and 12, to which latter are secured the eccentric-rods 13 and 14. The eccentric-rods 13 and 14 are connected to the grates of a furnace (not shown) to impart a rocking motion to them in such a way that there will be alternate periods of rest and motion. On the inner hubs of the eccentrics 5 and 6, which constitute the driven members of the herein-described clutch, are formed the clutch-teeth 15 and 16, which latter are adapted to mesh with the clutch-member teeth 17 and 18 of the main or driving clutch member 19. The main or driving clutch member 19 is splined on the shaft 3 in order to turn therewith, but to slide longitudinally thereon, and the said clutch member is provided with the peripheral and parallel guide-ways or grooves 20 and 21, which are adapted to receive the fixed or stationary shifting pin 22. The metal between the grooves 20 and 21 is cut away to form an open space between said grooves, which space is planed to a true flat surface to form a bearing for the switch-bar 23. (See Figs. 4 and 6.) The switch-bar 23 is pivoted on the pin 24, and the said bar is adapted to be swung to either side of said space to direct the shifting pin from the one groove into the other. For example, suppose the clutch member 19 to be rotating in the direction of the arrow *r* (see Fig. 4) and the

shifting pin 22 is in the groove 21, then when the said clutch member 19 has rotated till the said shifting pin 22 contacts with the switch-bar 23, the switch being in the position shown in the figure, the clutch member 19 will be moved longitudinally on the driving-shaft 3 in the direction of the arrow L till the said shifting pin 22 enters the groove 20. The pin while passing into said groove 20 contacts with one of a pair of diverging shifting wings 25, formed on said switch-bar 23, and throws the latter into the position shown in dotted lines, so that when said clutch member 19 has completed its cycle the shifting pin 22 is returned to the groove 21, and thus the said clutch member 19 is alternately reciprocated from right to left, and vice versa, while the shaft 3 is maintained in motion and while the switch-pin 22 is secured in engagement with either of the grooves of the clutch member 19 to cause the clutch-teeth 15 and 16 to be alternately engaged by the clutch-teeth 17 and 18 of the driving clutch member 19, and thereby impart motion to one of the eccentrics while the other is at rest. The shifting pin 22 is secured in the outer end of the latch 26, and the latter is adapted to be moved longitudinally in the latch-case 27, and the said latch 26 is maintained in position in its case 27, either in engagement with the grooves of the clutch member 19 or out of engagement therewith, by means of the binding-screw 32, which latter condition is required when the amount of fuel supplied to the furnace is excessive and it is necessary to more thoroughly consume it before adding fresh fuel. The latch-case 27 rests on the top surface of the supporting-bracket 28 and is pivoted at its inner end on the center pin 29, which is screwed or otherwise secured thereto. Between the lugs 30 of the supporting-bracket 28 and the sides of the latch case 27 are interposed the compensating springs 31, which latter are provided for the purpose of permitting the shifting pin 22 to yield, as in such a case as when the ends of the clutch-teeth 17 or 18 contact with either of the clutch-teeth 15 or 16 of the eccentrics 5 and 6, which occurrence always happens when the teeth of the driving member 19 do not fall in position to immediately mesh with the teeth of the driven members, the shifting pin 22 will yield to permit said driving member to gradually move into engagement during a very slight rotation of the driving member actuated by the reaction due to the compensating springs 31.

The operation of the mechanism is as follows: Continuous and regular rotative motion is imparted to the driving-shaft 3 and the driving member 19, mounted thereon, in the direction indicated. The latch 26 is moved outwardly till the shifting pin 22 enters one of either of the grooves 20 or 21—as, for example, the groove 20 (see Fig. 2)—and the said latch 26 is secured or locked in this position by the binding-screw 32. The driving-shaft 3 and the mechanism connected therewith or mounted thereon is now put in motion, and when the clutch member 19 has rotated till the shifting pin 22 contacts with the switch-bar 23 said clutch member 19 is caused to be moved longitudinally on its shaft 3 till the clutch-teeth 16 and 18 are fully disengaged and till the clutch-teeth 15 and 17 mesh or are fully engaged. The shifting pin 22 as it is switched into the next adjacent groove 21 contacts with the shifting wing 25 of the switch-bar 23 in said groove to reverse the position of the said switch-bar, and thereby cause the said shifting pin 22 to reënter the groove 20 after having been retained in the groove 21 during one revolution of the member 19, and thus the member 19 is automatically and regularly at intervals of one revolution reciprocated or moved alternately from side to side to cause alternate engagements and disengagements of the clutch-teeth 16 and 18 and the teeth 15 and 17, thereby producing alternate periods of rest and operation of the eccentrics 5 and 6.

Having thus fully described our invention, what we claim as new and useful, and desire to cover by Letters Patent of the United States therefor, is—

1. In an automatic clutch, the combination with a shaft, a driving member mounted thereon, and a driven member adapted to be engaged by said driving member, said driving member being provided with a pair of parallel peripheral grooves connected by an intermediate pass, of a shifting pin operatively related to said driving member and adapted to be engaged by either of said grooves, and means for shifting said pin alternately from one of said grooves to the other to impart to the driven member alternate periods of movement and rest.

2. In an automatic clutch, the combination with a shaft, a driving member mounted thereon, and a driven member adapted to be engaged by said driving member, said driving member being provided with a pair of parallel peripheral grooves connected by an intermediate pass, of a shifting pin operatively related to said driving member and yieldingly supported for engagement by either of said grooves, and means for shifting said pin alternately from one of said grooves to the other to impart to the driven member alternate periods of movement and rest.

3. In an automatic clutch, the combination with a shaft, a driving member slidably mounted thereon, and a driven member adapted to be engaged by said driving member, said driving member being provided with parallel peripheral grooves connected by an intermediate pass, of a shifting pin operatively related to said driving member and adapted to be engaged by one of said grooves, and means for automatically shifting the driving member while rotating to cause the shifting pin to be directed alternately from one of the

peripheral grooves to the other, whereby alternate periods of movement and rest are imparted to the driven member.

4. In an automatic clutch, the combination with a shaft, a driving member slidably mounted thereon, and a driven member adapted to be engaged by said driving member, said driving member being provided with parallel peripheral grooves connected by an intermediate pass, of a yieldingly-supported shifting pin operatively related to the driving member and adapted to be engaged by one of said grooves, and means whereby said shifting pin is directed alternately from one groove to the next adjacent one at the end of each rotation of the driving member to cause the latter to be alternately moved in opposite directions.

5. In an automatic clutch, the combination with a shaft, a driving member slidably mounted thereon, and a driven member adapted to be engaged by said driving member, said driving member being provided with parallel peripheral grooves connected by an intermediate pass, of a yieldingly-supported shifting pin operatively related to the driving member and adapted to be engaged by one of said grooves, and a switch-bar arranged in said connecting-pass and adapted to swing in transverse relation to said grooves, whereby said shifting pin is caused to move from one groove to the next adjacent one for shifting the driving member into and out of engagement with the driven member.

6. In an automatic clutch, the combination with a shaft, a driving member slidably mounted thereon, and a driven member adapted to be engaged by said driving member, said driving member being provided with peripheral grooves connected by an intermediate pass, of a shifting pin operatively related to the driving member and adapted to be engaged by one of said grooves, a switch-bar arranged in said connecting-pass and adapted to swing in transverse relation to said grooves, and means carried by said switch-bar and adapted to be engaged by said shifting pin for swinging the switch-bar in opposite directions.

7. In an automatic clutch, the combination with a shaft, a driving member mounted thereon, and a driven member adapted to be engaged by said driving member, said driving member being provided with peripheral grooves connected by an intermediate pass, of a switch-bar arranged in said connecting-pass and adapted to swing in transverse relation to said grooves, a shifting pin operatively related to the driving member and adapted to be engaged by one of said grooves for alternately shifting the switch-bar from one groove to the next adjacent one, a latch for said shifting pin, a case for said latch, and means for operating said latch to position the shifting pin in operative relation to the driving member.

8. In an automatic clutch, the combination with a shaft, a driving member mounted thereon, and driven members arranged at the sides of the driving member and adapted to be alternately engaged by the latter, said driving member being provided with a pair of parallel peripheral grooves connected by an intermediate pass, of a shifting pin operatively related to said driving member and adapted to be engaged by either of said grooves, and means for shifting said pin alternately from one of said grooves to the other to impart to the driven members alternate periods of movement and rest.

9. In an automatic clutch, the combination with a shaft, a driving member mounted thereon, and driven members arranged at the sides of the driving member and adapted to be alternately engaged by the latter, said driving member being provided with a pair of parallel peripheral grooves connected by an intermediate pass, of a shifting pin operatively related to said driving member and adapted to be engaged by either of said grooves, and means for shifting the driving member while rotating to cause the shifting pin to be directed alternately from one of the peripheral grooves to the other, whereby alternate periods of movement and rest are imparted to the driven members.

10. In an automatic clutch, the combination with a shaft, a driving member mounted thereon, and driven members arranged at the sides of the driving member and adapted to be alternately engaged by the latter, said driving member being provided with a pair of parallel peripheral grooves connected by an intermediate pass, of a yieldingly-supported shifting pin operatively related to the driving member and adapted to be engaged by one of said grooves, and means whereby said shifting pin is directed alternately from one groove to the next adjacent one at the end of each rotation of the driving member to cause the latter to be alternately moved in opposite directions.

In testimony whereof we have hereunto set our hands in the presence of two subscribing witnesses.

GEORGE S. HUFF.
JAKE J. HUFF.

Witnesses:
THOMPSON R. BELL,
F. H. EWERS.