No. 778,820. PATENTED DEC. 27, 1904.

F. A. BROWNELL.

CLUTCH.

APPLICATION FILED OCT. 20, 1904.

2 SHEETS—SHEET 1.

Fig. 3.

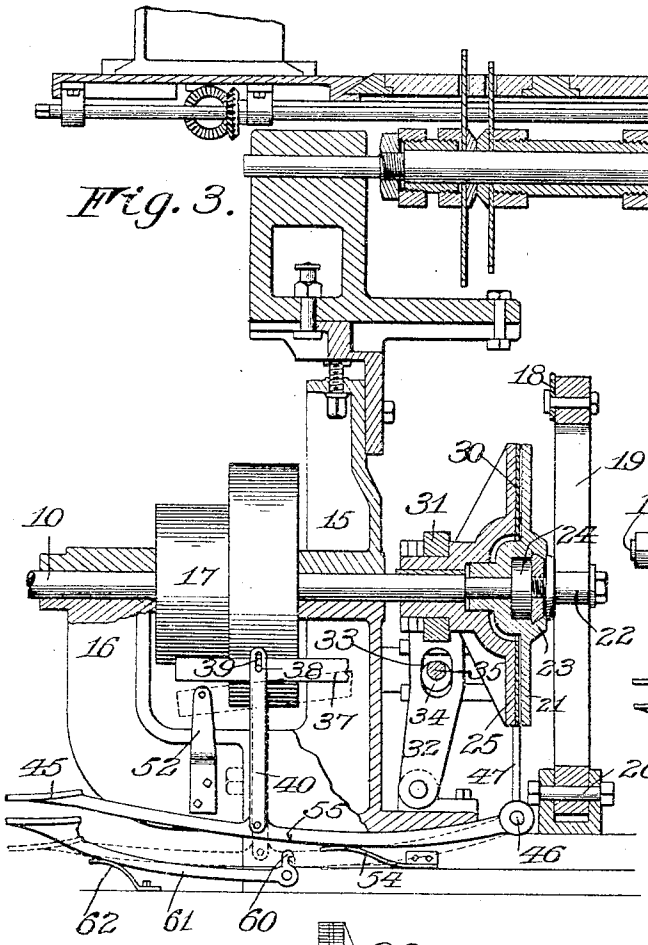


Fig. 1.

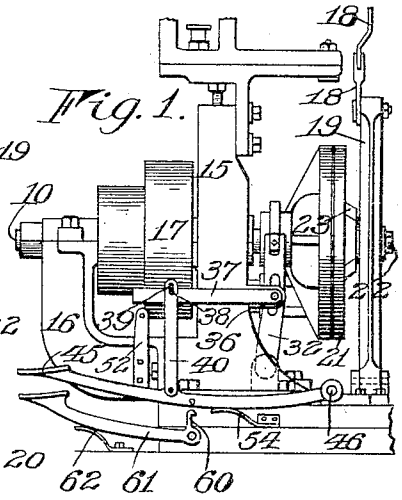
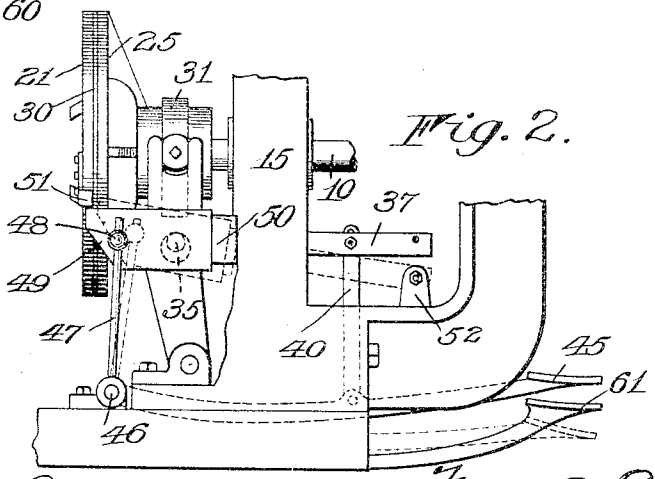


Fig. 2.



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2 SHEETS—SHEET 2.

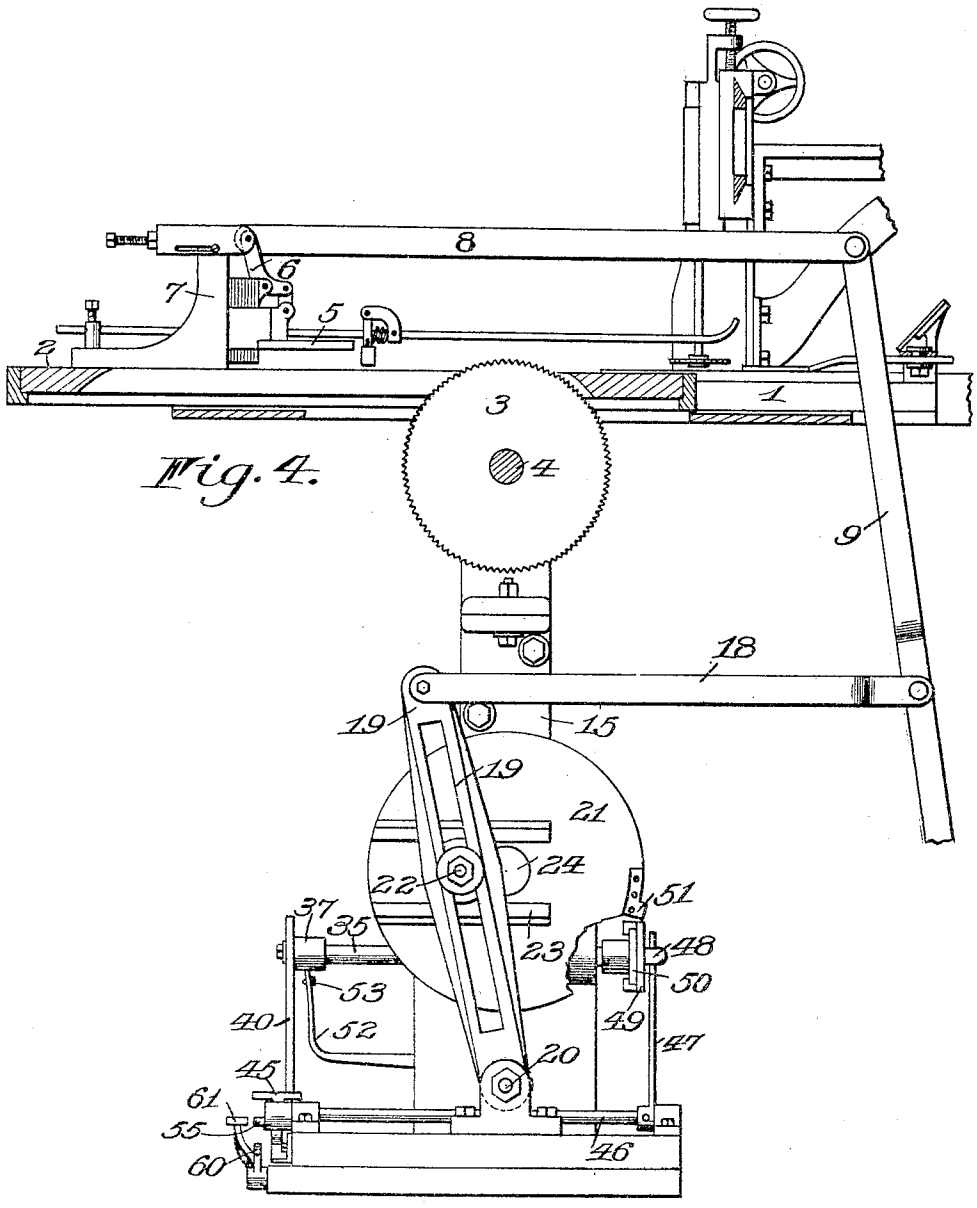


Fig. 4.

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UNITED STATES PATENT OFFICE.

FRANK A. BROWNELL, OF ROCHESTER, NEW YORK.

CLUTCH.

SPECIFICATION forming part of Letters Patent No. 778,820, dated December 27, 1904.

Original application filed June 10, 1897, Serial No. 640,267. Divided and this application filed October 20, 1904. Serial No. 229,241.

To all whom it may concern:

Be it known that I, FRANK A. BROWNELL, of Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Clutches; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the reference-numerals marked thereon.

My present invention has for its object to provide a clutch for transmitting motion from a driving member to a driven member, including also means for automatically disconnecting said members and arresting the movement of the driven member at a predetermined point.

To these and other ends the invention consists in certain improvements and combinations of parts, all as will be hereinafter more fully described, the novel features being pointed out in the claims at the end of the specification.

In the drawings, Figure 1 is a side elevation of a machine illustrating the construction and operation of the clutch mechanism embodying my invention. Fig. 2 is a similar view looking at the rear side of the clutch mechanism. Fig. 3 is a view similar to Fig. 1, some of the parts being shown in section; and Fig. 4 is an end elevation of the clutch mechanism.

Similar reference-numerals in the several figures indicate similar parts.

A device embodying my invention is adapted to be used for various forms of machines embodying an intermittently-operated part to which motion is transmitted from a continuously-operated driving member, and in the present illustration I have shown a wood-working-machine, such as the one disclosed in a prior application filed by me on the 10th of June, 1897, bearing Serial No. 640,267, of which this case is a division. The machine itself is one adapted for sawing and grooving small boards or other articles, and it embodies generally a table-top 1, having therein a reciprocating section 2, on which the material to be operated upon is carried past tools 3 in the form of saws clamped to the shaft 4, which is supported in suitable bearings and rotated by a belt or other driving connection. In the present instance the material is secured to the table by a clamping device embodying the vertically-operated presser-head 5, operated by a bell-crank lever 6, pivoted to a bracket or support 7 on the movable table-section and actuated by means of a rod or link 8, attached to the pivoted arm 9 and also having a slotted connection with the bracket 7, whereby as the link 8 is drawn forwardly the head 5 will be first operated into engagement with the work-piece, clamping the latter to the table, when the continued outward movement of the link will cause the table-section to be moved rearwardly to carry the work-piece past the tools or saws 3.

The main shaft or driving member 10 is journaled in one of the side portions 15 of the main frame of the machine, and its outer end is supported in a bracket 16, inclosing a step-pulley 17, adapted to receive the driving-belt, as will be understood, and between this shaft and the devices for reciprocating the movable section of the table the clutch mechanism embodying my invention is arranged, whereby the table may be operated continuously or intermittently, the parts of which are so arranged that when the table is arrested it is in its forward or outermost position to receive a work-piece.

As stated, the movement of the clamp and table is caused by the oscillation of the lever 9, and while this may be accomplished by any suitable means I prefer to connect it to a link 18, attached to the end of a slotted lever 19, pivoted at its lower end, as indicated at 20, and connected with a rotary disk or driven member 21 by a crank-pin 22, secured between the parallel ways 23, whereby it may be adjusted relatively to the center of the disk to vary the oscillatory movement of the lever 19 to produce the desired length of stroke. The disk 21 is journaled loosely upon the ends of the shaft 10, its outward movement thereon being prevented by means of a head 24. Also mounted upon the driving shaft or member is keyed a relatively longitudinally movable disk 25, having its face provided with a covering 30 of leather or other suitable material, which

will form a suitable surface to frictionally engage the proximate face of the disk 21. At the rear side of the disk 25 projects a hub on which is journaled a loose collar 31, connected to a shifting-lever 32, pivoted to the base of the machine. This lever is provided with a slot or aperture 33, in which is located a cam 34, mounted on a shaft 35, supported in a bearing 36 on the frame 15. At one end of the shaft 35 is an arm 37, carrying a pin 38, extending into a slot 39 in a link 40, which is connected at its lower end to a foot-lever 45, attached to a rock-shaft 46, carrying at its rear end a rock-arm 47, having its end extending loosely through a boss 48 on an adjustable shoe or stop 49, slidably mounted upon a head 50, supported upon the shaft 35. The end of this stop or sliding shoe is adapted when projected to coöperate with a stop or projection 51, arranged upon the periphery of the disk 21, so that when the two stops are in engagement the disk will be arrested with the parts in the position shown in full lines in the several figures.

In order to temporarily hold the arm 37 in the operative position, I provide the spring-arm 52, having a point or projection 53 thereon, coöperating with the recess or depression formed in the arm 37 to retain the latter in the position shown in dotted lines in Figs. 2 and 3, the friction between these parts being easily overcome, as will be explained. The treadle or lever 45 is yieldingly supported in its normal position by a spring 54, and at one side it is provided with a lug or projection 55, adapted to engage beneath a latch or projection 60 on a treadle 61, which is also supported in its normal position by a spring 62.

From the foregoing it will be seen that when the parts are in the position of rest, as shown in the several figures, with the stops 49 and 51 in engagement and the friction-disks disconnected the operator to start the machine presses the treadle 45 downwardly to the position shown in dotted lines in Fig. 3. This movement engages the projection 55 beneath the latch 60 and draws the arm 37 downwardly into engagement with the spring-fingers or frictional retainer 52. The first movement of the treadle 45 withdraws the stop 49 from beneath the stop 51, and the subsequent movement of the lever 37 rotates the shaft 35 and the cam 34 thereon, causing the disk 25 to be moved outwardly and held with sufficient frictional engagement against the disk 21 to cause the operation of the work-clamp and the feed-table in the manner heretofore described. When it is desired to stop the operation of the feeding devices, the operator by pressing upon the treadle 61 releases the treadle 45, allowing it to be moved upwardly by the spring 54, when the slight movement of the treadle relative to the lever 37, which is permitted by the slot 39 in the link 40, allows the stop 49 to be projected into its normal position by the shifting-arm 47 without altering the position of the cam 34, which is retained in operative position by the arm 37 and the friction device 52 until the stop 51 engages the stop 49 and rotates the shaft 35 to cause a positive disengagement of the driving and driven members.

A clutch mechanism embodying my invention is simple in construction and operation, and while it is adapted, as will be understood, for other uses than those described it is intended to be employed particularly where it it desired to arrest a mechanism at some particular point of operation.

I claim as my invention—

1. The combination with a rotary shaft and a driving clutch member rotating therewith, of a driven clutch member, a stop thereon, and a clutch-actuating arm, an independently-movable stop controlled by the clutch-actuating arm and means for projecting said stop in the path of the stop on the driven member to actuate the arm and cause the automatic disconnection of the members.

2. The combination with a rotary shaft, a driving clutch member rotating therewith, and a driven clutch member, of a stop thereon, a clutch-actuating arm, and devices for retaining the clutch members in engagement, an adjustable stop connected to said arm and operated independently thereof and means for projecting said stop in the path of the stop on the driven member to positively operate the driving member out of contact with the driven clutch member.

3. The combination with a rotary shaft and a driving clutch member rotating therewith, of a driven clutch member having a stop thereon, an oscillatory shaft having a cam and connections between the shaft and one of the clutch members for connecting and disconnecting them, a movable stop connected to the oscillatory shaft and coöperating with the stop on the driven clutch member to cause the disengagement of the clutch members and means for operating the rock-shaft to hold the movable stop out of operative position and to hold the clutch-sections in engagement.

4. The combination with a rotary shaft and a driving clutch member rotating therewith, of a driven clutch member, a stop thereon and a shifting-arm for causing the engagement and disengagement of the clutch members, a movable stop connected to said arm and adapted to be projected in the path of the stop on the clutch member, retaining devices for holding the shifting-arm when the clutch is engaged, and an actuating-lever having a loose connection with the shifting-arm and also with the movable stop, whereby when moved in one direction the clutch will be engaged and when moved in the other the movable stop will be projected in the path of the stop on the clutch member.

5. The combination with a rotary shaft and

a driving clutch member rotating therewith, of a driven clutch member, a stop thereon and a shifting-arm for causing the engagement and disengagement of the clutch members, a movable stop connected to said arm and adapted to be projected in the path of the stop on the clutch member, frictional retaining devices for holding the shifting-arm to retain the clutch members in engagement, an actuating-lever having a loose connection with the shifting-arm and also with the movable stop, a device such as a spring for automatically operating said actuating-lever and a catch for holding the lever.

6. The combination with a rotary shaft and a driving clutch member rotating therewith, of a driven clutch member, the stop thereon and the arm operating the driving clutch member, the cam-shaft actuating it, the arm on the cam-shaft having the stop movable independently thereon for engaging the stop on the clutch member, the treadle having the arm loosely engaging the movable stop and the slip connection between the treadle and the cam-shaft, means for operating the treadle in one direction, and a retainer for the treadle.

7. The combination with a rotary shaft, and a driving clutch member rotating therewith, of a driven clutch member having a stop, a clutch-shifting arm and a cam-shaft having two arms thereon, a sliding stop on one of said arms, a pivoted treadle loosely connected to the movable stop and a link loosely connecting one of the arms on the cam-shaft and the treadle, a yielding retaining device for said last-mentioned arm and devices for retaining the treadle when moved in one direction.

8. The combination with a rotary shaft, and a driving clutch member rotating therewith, of a driven clutch member having a stop, a clutch-shifting arm and a cam-shaft having two arms thereon, a movable stop on one of said arms, a pivoted treadle and a loose connection between one side of the treadle-pivot and the stop, a loose connection between the other side of the treadle-pivot and the other arm on the cam-shaft and a yielding retainer for the cam-shaft, a spring for actuating the treadle in one direction and a spring-operated catch for engaging and holding the treadle, substantially as described.

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