F. T. JOHNSON.

DRIVING MECHANISM.

APPLICATION FILED OCT. 4, 1915.

1,200,620. Patented Oct. 10, 1916.

Fig. 1.

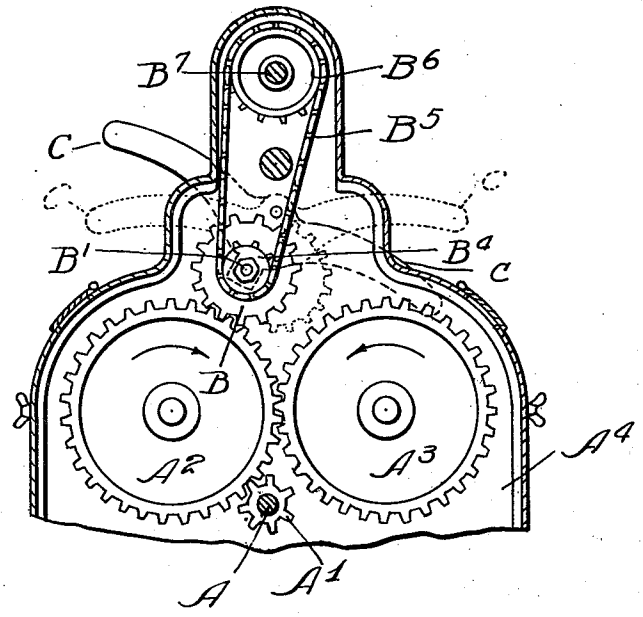


Fig. 2.

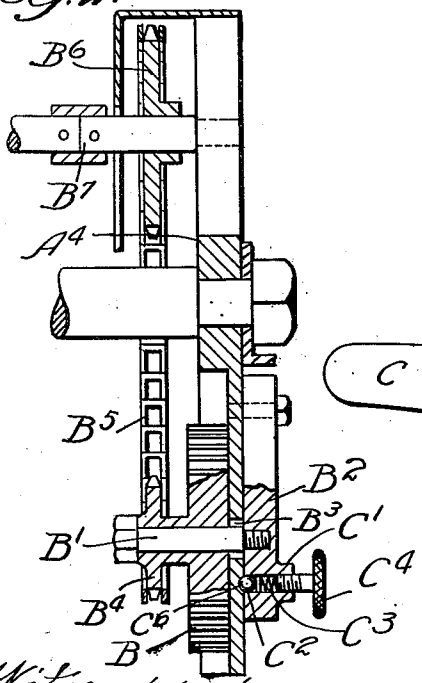
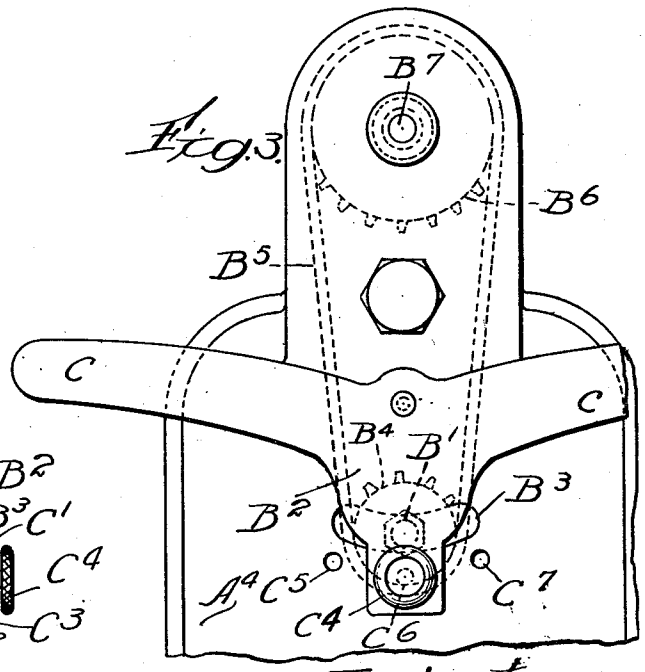


Fig. 3.



Witnesses:

Christina Deans

Inventor,

Francis T. Johnson.

by Parker & Carter

his Attys:

UNITED STATES PATENT OFFICE.

FRANCIS T. JOHNSON, OF CHICAGO, ILLINOIS.

DRIVING MECHANISM.

1,200,620. Specification of Letters Patent. Patented Oct. 10, 1916.

Original application filed June 7, 1915, Serial No. 32,525. Divided and this application filed October 4, 1915. Serial No. 53,871.

To all whom it may concern:

Be it known that I, FRANCIS T. JOHNSON, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Driving Mechanisms, of which the following is a specification, being a divisional application of No. 32,525, Francis T. Johnson washing-machine, filed June 7, 1915.

My invention relates to improvements in driving mechanisms and the like such as are adapted to be used in connection with washing machines and wringers where the wringer is driven from the washing machine drive or in any other situation where it is desirable that a member driven from or by a suitable source of power may be started, stopped or reversed at the will of the operator.

One object of my invention is to provide a drive that may be conveniently and easily manipulated.

Another object is to provide a drive that will become disconnected automatically when the power transmitted or the resistance encountered by it exceeds a predetermined amount.

Another object of my invention is to provide means whereby the operator may adjust the device so that such automatic disconnection of the drive will take place under any desirable conditions, that is to say, so that the operator may set the device to automatically disconnect any desired load. My transmission mechanism therefore provides means for stopping, starting and reversing a driven part, and it partakes of the characteristics of a clutch and a reversing gear as well as an automatic cut out.

Further objects of my invention will appear from time to time in the specification.

This application contains subject matter divided out of my copending application, Serial No. 32,525, filed June 7, 1915, for washing machines, and I wish it therefore to be regarded as a divisional application based upon that parent application.

My invention is illustrated more or less diagrammatically in the accompanying drawings, wherein—

Figure 1 is a front elevation of my device, showing the housing in section. Fig. 2 is a vertical section at right angles to Fig. 1. Fig. 3 is a front elevation of a part of the controlling mechanism showing the housing and supporting parts.

Like parts are indicated by similar letters in all the figures.

A is a drive shaft. It is driven by any suitable source of power not here shown.

A^1 is a pinion carried thereby. This pinion is in mesh with the gear A^2, and the gear A^2 is in turn in mesh with an exactly similar gear A^3. These two gears are mounted for rotation upon parallel axes parallel both with the drive shaft so that they turn in opposite directions at exactly the same speed. They are both inclosed within a housing A^4.

B is a reversing pinion. It is mounted for rotation on a pin B^1 which pin is carried by a lever B^2 pivoted on the housing A^4. The lever is on one side of the housing, the gear on the other. The pin passes through a slot B^3 in the housing. Mounted for rotation with the pinion B is a sprocket B^4, and this sprocket drives a sprocket chain B^5, which in turn drives a sprocket B^6 on the driven shaft 7. The pivot point of the lever B^2 on the housing A^4 is intermediate the axis of rotation of the two sprockets. The lever B^2 is provided with the two hand pieces C, C, whereby the lever may be rotated from either side by the hand of the operator to bring the reversing pinion into mesh with either one or the other of the reversing gears.

C^1 is a boss on the lower end of the lever B^2, below the axis of the reversing pinion. This boss is hollow and contains a ball C^2 pressed yieldingly against the surface of the housing A^4 by the spring C^3, the tension being adjustable by means of the hand-wheel C^4. The surface of the housing is apertured at C^5, C^6, C^7, to hold the lever yieldingly in either one of the three, forward, reverse or neutral, positions.

It will be evident that while I have shown in my drawings an operative device, still many changes might be made in size, shape and arrangement of parts without departing from the spirit of my invention.

The use and operation of my invention are as follows: The two driving gears rotate in unison, being driven from a suitable source of power as indicated. They rotate in opposite directions at exactly the same speed. When the reversing pinion is moved so that it is in mesh with one of them

and there held by the spring pressed ball, the pinion is driven by the rotation of the gear. This, through the action of the sprocket chain and sprocket, drives the driven shaft. When the operator rotates the lever, he will first disengage the pinion, swinging the parts into the neutral position, and if he continues the movement, he will reëngage the pinion with the other gear, thus causing it to rotate in the opposite direction. It will be understood that since the center of oscillation of the controlling lever is below the center of the upper driven sprocket, there will be a slight variation in the tension on the sprocket chain, but this will be taken care of by the elasticity of the parts, and by the looseness or backlash in the chain, and in any event will be very slight.

Considering now the parts shown in the full line, the reversing pinion will be in mesh with the clockwise moving gear, and will so be moving counter clockwise and driving the sprocket accordingly. If now, we consider that the driven shaft is driving a certain variable load, it will be understood that so long as the load does not exceed a certain predetermined point, the drive will be continuous in the usual manner. If, however, the load should increase the resistance to the rotation of the reversing sprocket would also increase, and as it increases, the turning movement or radial pressure exerted by the driving gear on the pinion will increase, and this increase will continue until this increased force is sufficient to overcome the yielding resistance of the ball and recess and rotate the lever about its axis. This force it will be noted, will be exerted in a direction tangent to the pitch line of both gear and pinion, and perpendicular to the line adjoining their intersections and the axis of oscillation of the lever. As I have shown the parts, this line is a continuation of the line adjoining the centers of the gear and pinion, but it will be obvious that it is not necessary that the center of oscillation of the lever be on the line adjoining the centers of gear and pinion, for if the center of oscillation of the lever were off that line, then the force tilting the lever would be a component of the tangential force at the gear teeth working in a line perpendicular to the radius drawn from the center of oscillation of the lever to the point of contact between the gear and pinion. It will be obvious that the same situation prevails when the pinion is in mesh with the other gear, and that by a manipulation of the spring pressure, the operator may vary the resistance, and thus control the point at which the automatic release comes into operation.

I claim:

1. A driving mechanism comprising a supporting frame, a pair of gears rotating in opposite directions, a driven member carried on the supporting frame, a pinion, means for driving the driven member in response to the rotation of said pinion and means for swinging the pinion at the will of the operator into mesh with either one of the two gears selectively, and yielding means for holding the pinion in mesh with such gear, the pinion being free to swing outwardly away from mesh with the driving gear against the resistance of such yielding means when the pressure exerted upon the gear by the pinion exceeds a predetermined point.

2. A transmission mechanism comprising a pair of gears mounted adjacent one another and driven in opposite directions, a reversing pinion, a pivoted support therefor and means for rocking said support to bring said pinion into engagement with either one of said gears or into a neutral position, means for yieldingly holding the support in whichever one of its three selected positions it may be placed by the operator.

3. A transmission mechanism comprising a pair of gears mounted adjacent one another and driven in opposite directions, a reversing pinion, a pivoted support therefor and means for rocking said support to bring said pinion into engagement with either one of said gears or into a neutral position, the relative position of gears, pinion and support being such that when the support is in a central position the pinion is out of mesh with both gears, means for yieldingly holding the support in whichever one of its three selected positions it may be placed by the operator.

4. A driving mechanism comprising two driving members rotating in opposite directions, a driven member interposed between them, means for selectively moving said driven member into engagement with one of said driving members and means for yieldingly holding it in any position in which it is placed.

5. A driving mechanism comprising two driving members rotating in opposite directions, a driven member interposed between them, means for selectively moving said driven member into engagement with one of said driving members and means for yieldingly holding it in any position in which it is placed, said driven member being free to move out of engagement with said driving member when the force exerted upon it by the driving member exceeds a predetermined amount.

6. A driving mechanism comprising a driving gear and a driven pinion, a driven member, a flexible connection between it and the pinion, an arm upon which the pinion is rotatably mounted, said arm being pivoted and free to rock to bring the gear and pinion into mesh with one another, and yielding

means for holding the pinion in mesh with the gear the power being applied by the gear to the pinion in a direction substantially opposed to the movement of the pinion on its arm as it comes into engagement with the gear.

In testimony whereof, I affix my signature in the presence of two witnesses this 20th day of September, 1915.

FRANCIS T. JOHNSON.

Witnesses:
ESTHER VAN FRANK,
CHRISTINA DEANS.