

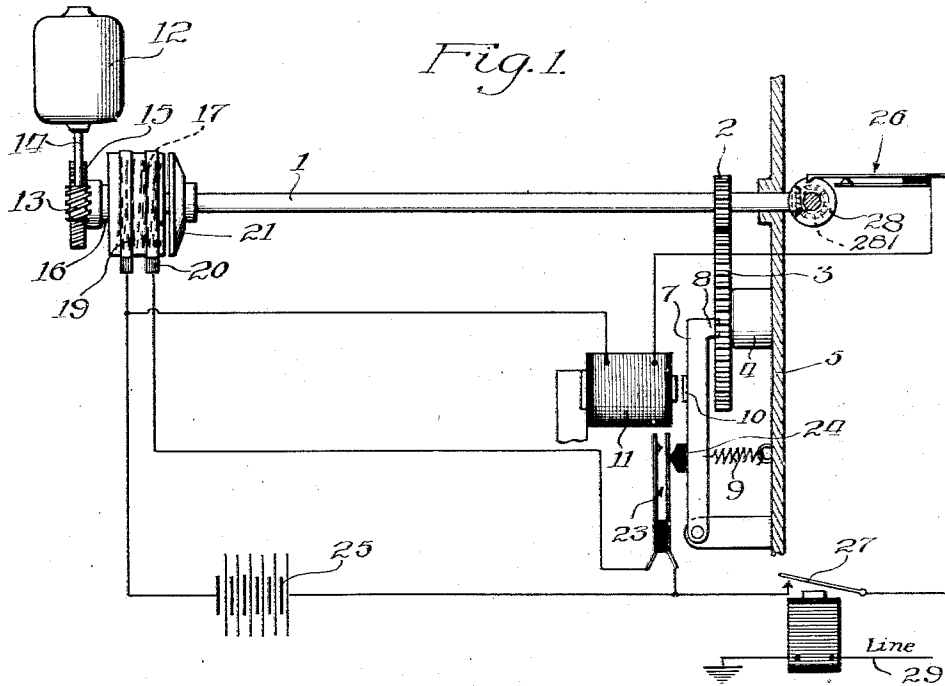
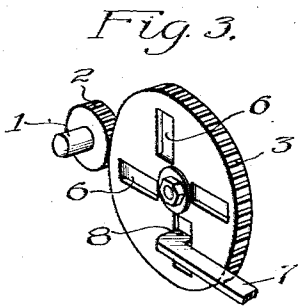
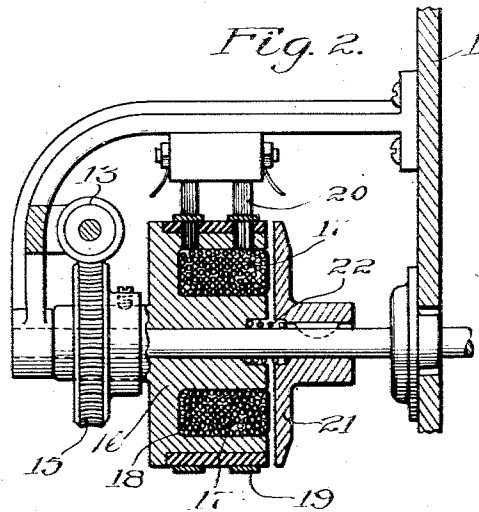
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AUTOMATIC CLUTCH

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AUTOMATIC CLUTCH.

Application filed July 16, 1926. Serial No. 122,914.

This invention relates to improvements in clutches, more especially for printing type-
writer telegraphs and the like, wherein it is
desired to release and rotate a member, such
as the distributor wheel, by electrical means.

Heretofore the distributors in such mecha-
nisms as printing telegraphs and the like,
have been frictionally connected to a con-
stantly rotating shaft. The distributor wheel
was held from rotating by mechanical
means such as a latch, and released by an elec-
tromagnet. This arrangement involved con-
siderable friction at the connection between
the driven member and the driving member
in idle positions; consequently only a light
pressure could be used with the result that
slippage occurred when the driven member
was released and, when several distributors
were to be operated in synchronism, perfect
uniformity in turning was unobtainable at
high speeds.

The main objects of this invention are to
provide means for simultaneously releasing
and rotating remotely positioned distributor
wheels one complete revolution in synchro-
nism; to provide such means wherein the
clutch is out of engagement while the shaft
is being held from rotating; to provide means
controlled directly by the holding latch for
operating the clutch; to provide means for
turning the shaft one revolution which means
may be controlled by one impulse from the
line circuit and also not again effected until
the cycle has been completed.

An illustrative embodiment of this inven-
tion is shown in the accompanying drawings
in which:

Figure 1 is a diagram of the arrangement
of the mechanism for controlling the dis-
tributor shaft of a telegraph device, operated
from a line circuit.

Fig. 2 is a plan section of the magnetic
clutch of the mechanism shown in Fig. 1.

Fig. 3 is a perspective illustrative of the
holding wheel and latch.

In this invention a spur gear is meshed
with a pinion on the distributor or operated
shaft. The spur gear has a plain surface on
one side and is provided with the locking re-
cesses. A holding latch is pivotally mounted
at one end and resiliently pressed into en-
gagement with the side surface of the wheel
to engage in the respective recesses. The re-

cesses are suitably spaced so that the driven
shaft turns one complete revolution each time
the latch lever is released before the lever en-
gages the next recess. A magnetic clutch is
provided for connecting the shaft to a con-
stantly driven motor, and the switch for en-
ergizing the clutch is controlled by the move-
ment of the latch lever.

Referring to the drawings, the shaft 1 re-
presents the distributor shaft which is rotat-
ably mounted in each sending or receiving
machine. The pinion 2 is fixed on the shaft
and meshes with a spur gear 3 which is rotat-
ably mounted on a lug 4 in the frame 5 of
the machine. Preferably the gear 3 is made
four times the size of the pinion 2, and ac-
cordingly four recesses 6 are provided in the
lateral surface of the gear 3. The latch 7
is pivoted to the frame 5 at the outer end,
and is provided with a lateral projection 8
at the inner end for riding on the surface
of the gear 3 and engaging in the recesses 6.
The latch is pressed into engagement with the
gear by means of the spring 9, which is ex-
tended between the latch and a portion of
the frame 5.

The armature 10 is secured to the latch in
positional relation with the electro-magnet
11, which is rigidly secured to the frame 5 of
the machine in any suitable manner. When
the magnet 11 is energized, the latch 7 is re-
tracted from engagement in the recesses 6
and the shaft 1 is permitted to rotate one com-
plete revolution. The latch will then engage
the succeeding recess and again hold the shaft
in starting position.

A constantly driven motor 12 is connected
to a local power source for driving the shaft.
The worm 13 is keyed on the motor shaft 14
and meshes with a worm gear 15 which is se-
cured to the hub of the clutch drum 16. The
drum 16 is rotatably mounted on shaft 1. An
energizing coil 17 is mounted in an annular
recess 18 provided in the inner surface of the
drum 16, and the opposite terminals of the
coil 17 are connected respectively to the con-
ductor rings 19 which are insulatingly
mounted on the periphery of the drum 16.
Current is conveyed to rings 19 by means
of the spring pressed brushes 20 which are in-
sulatingly mounted on the frame 1, and elec-
trically connected, as hereinafter described.

The clutch flange 21 is keyed to the shaft 1

adjacent the inner surface of the magnetic clutch drum 16, and is slidable on the shaft, so that when the coil 17 is energized the flange 21 is drawn into frictional engagement with the surface of the drum 16, and thereby connects the shaft with the driving motor. A spring 22 is provided for separating the flange from the drum, and is mounted in suitable recesses in said members, surrounding the shaft 1.

For controlling the clutch, a switch 23 is provided. This switch comprises two insulated spring arms which are normally out of contact and are rigidly mounted in positional relation to the lever 7. The lever 7 is provided with an insulating block 24 which contacts with one of the leaves of the switch 23 and causes the leaves to contact when the latch 7 is out of engagement with a recess 6. The local battery 25 is connected to one side to the clutch coil 17, and the latch release magnet 11. The opposite terminal of the coil 17 is connected to the upper leaf of the switch 23, the opposite leaf of the switch being connected to the opposite side of the battery 25. The opposite terminal of the magnet 11 is connected through a cam operated switch 26, through a line operated switch 27, and back to the opposite terminal of the battery 25. The switch 26 is normally closed when the shaft is in starting position, and is opened while the shaft is turning by means of a cam 28 which is revolvably connected to the shaft 1 by means of the miter gears 281.

When an impulse is received from the line 29, the switch 27 is closed. This completes a circuit from the battery 25 through the magnet 11, through the switch 26, and back to the battery. The magnet 11 is thereby energized and the end of the latch 7 is drawn out of engagement with a recess 6 against the action of the spring 9 and rides on the surface of the gear 3. The outward movement of the latch 7 closes the switch 23 and energizes the clutch coil 17 to connect the shaft 1 to the motor 12. The clutch remains energized because the latch is held out until the shaft completes one revolution, whereupon the spring 9 causes the latch 7 to engage in the succeeding recess 6 to stop the shaft and simultaneously break the circuit through the coil 17.

By the means just described, considerable

locking force may be impressed in the clutch to prevent slippage, since the clutch is only operated or energized while the shaft is released and is immediately de-energized when the shaft is stopped. By breaking the circuit for the latch releasing magnet, the magnet is given time to de-energize so that the latch may engage quickly.

While but one illustrative embodiment of this invention has been herein shown and described, it will be understood that numerous details of the construction shown may be altered or omitted without departing from the spirit of this invention as defined by the following claims.

We claim:

1. In combination, a rotary drive member, a rotatable shaft, a magnetic clutch for connecting the shaft to said member, a latch related with the shaft and yieldably moved into holding engagement therewith at the termination of predetermined rotational movements of the same, an electromagnet for retracting the latch, a switch for said clutch closed by the latch when the latch is in its retracted position, a normally closed switch opened by the driven shaft in rotating, and a line relay switch connected in series with the last mentioned switch for energizing the electromagnet.

2. In combination with a rotary drive member, a rotatable shaft, and a magnetic clutch for connecting the shaft to said member, a wheel connected to the shaft, said wheel having notches in one face thereof, a latch yieldably pressed against said face of the wheel to engage in said notches for holding the shaft, an electrical source, a clutch switch for connecting the source to the magnetic clutch, said clutch switch being closed by the latch when the latch is withdrawn from the notches, a latch magnet for retracting the latch, a line relay switch, and a normally closed latch magnet switch opened by the driven shaft in rotating, said line relay switch and latch magnetic switch being adapted to jointly connect said source to the latch magnet.

Signed at Chicago this 14th day of July, 1926.

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