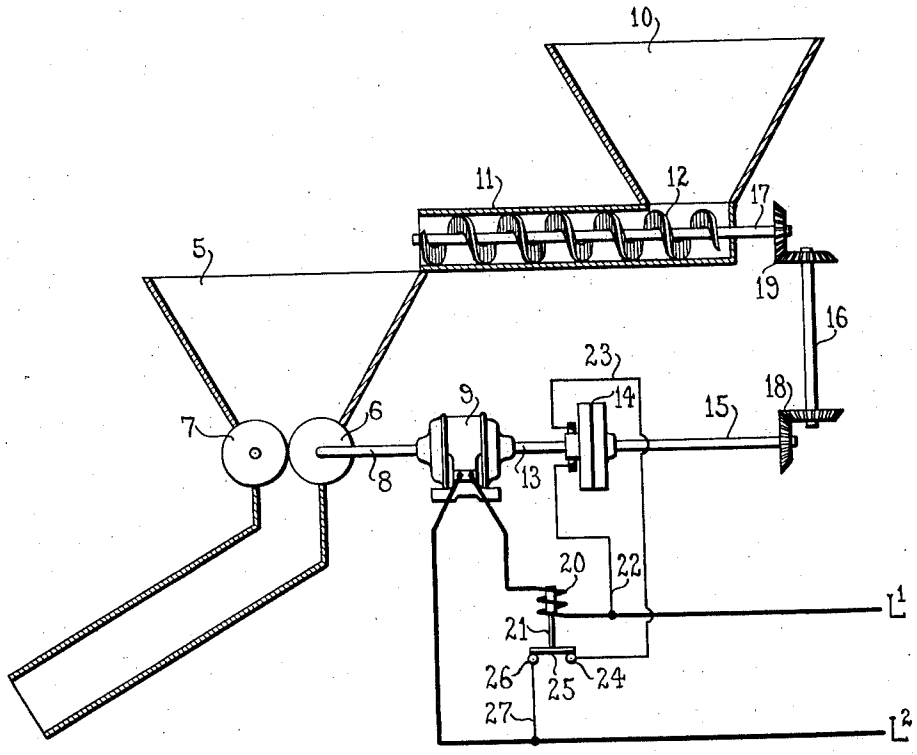
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CONTROLLER FOR MOTOR DRIVEN DEVICES

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CONTROLLER FOR MOTOR-DRIVEN DEVICES

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This invention relates to controllers for motor driven devices, and more particularly to the control of electromagnetically operated clutches forming part of the driving mechanism.

The invention has among its objects to provide means sensitive to operating conditions in one driven device for controlling the operation of a related driven device.

Another object is to provide means of the above character for automatically interrupting the drive of one of a number of jointly driven devices under given electrical conditions in the power circuit.

Another object is to provide an electrical relay for automatically controlling the connection or disconnection of one of a plurality of driven devices from a common driving motor.

Another object is to provide a relay of the above character which is sensitive to current conditions in the motor circuit.

Various other objects and advantages of the invention will hereinafter appear.

The accompanying drawing diagrammatically and schematically illustrates an embodiment of the invention which will now be described, it being understood that the embodiment illustrated is susceptible of modification without departing from the scope of the appended claims.

In the drawing the numeral 5 designates the hopper of a grinding of pulverizing mill, suitable grinding rollers or cylinders 6 and 7 being located at the lower end thereof. Roller 6 is adapted to be driven through a suitable connection 8 by an electric motor 9; whereas any suitable connecting gearing (not shown) may be provided for between the rollers 6 and 7.

Motor 9 is also arranged to drive a suitable device for feeding or conveying material to hopper 5 of the grinding mill, said device comprising a hopper 10 and a trough or tube 11 adapted to house a screw or disk conveyer 12. The driving connections for the latter are shown as comprising the motor shaft 13, electromagnetically operated clutch 14, and shaft sections 15, 16 and 17 connected through suitable bevel gearing 18 and 19.

Motor 9 is adapted to be supplied from a suitable source of power through lines L^1, L^2, and arranged in series with the motor circuit is the coil 20 of a jamming or current relay 21. Said relay in its normally closed position is adapted to complete the energizing circuit of electromagnetic clutch 14, which circuit may be traced from line L^1, by conductor 22, through the winding of clutch 14 in the usual manner, by conductor 23 through contacts 24, 25 and 26, and by conductor 27 to line L^2. With the motor 9 and clutch 14 thus energized material placed in the hopper 10 will be automatically fed or conveyed therefrom into hopper 5 and ground by the rollers 6 and 7. Under certain conditions, however, the amount of material fed by the conveyer 12 may be in excess of that which can be properly disposed of by the grinding rollers. In other words, the mill will tend to become choked or overloaded. The value of the current in the motor circuit will of course rise in proportion to the amount of overload upon the mill whereas winding 20 of relay 21 is so calibrated that when said current exceeds a certain predetermined value the relay will operate to interrupt the aforedescribed energizing circuit of clutch 14, thereby interrupting the drive of conveyer 12. The motor 9, however, will continue to drive the grinding rollers 6 and 7, and when the motor current decreases, say about ten to twenty per cent, due to the reduction of the overload, relay 21 will again close to energize the clutch 14 and re-start the operation of conveyer 12. The aforedescribed temporary interruptions of the drive of conveyer 12 will be automatically effected from time to time as conditions require.

While for purposes of illustration I have shown the device as supplied from a source of direct current, it will be apparent to those skilled in the art that the same may be readily adapted for use with alternating current if desired.

What I claim and desire to secure by Letters Patent is:

1. In a controller, the combination with a plurality of driven devices, of a motor for normally driving said devices jointly and

continuously, and means comprising an electromagnetic clutch operable to positively disconnect from the drive certain of said devices for temporary stopping of the latter in response to given abnormal electrical conditions in the motor circuit, said means being also operable automatically to thereafter effect reconnection of said certain of said devices with said drive.

2. In a controller, the combination with a plurality of devices for handling material, of a motor for normally driving said devices jointly, a circuit for said motor, an electromagnetic clutch connection between said motor and one of said devices, and means operable automatically for normally completing the energizing circuit of said clutch, said means being also operable automatically to temporarily interrupt the energizing circuit of said clutch in response to given abnormal electrical conditions in the motor circuit.

3. The combination with a plurality of devices to be driven, of an electric motor for normally driving said devices jointly, said drive including an electromagnetically operable clutch interposed between said motor and one of said devices, means for normally subjecting the operating winding of said clutch to energization from the source of motor current supply and for temporarily interrupting the energizing circuit of said winding in response to given abnormal electrical conditions in the motor circuit, said means comprising a normally closed relay having its operating winding in series with said motor circuit.

4. The combination with a grinding or pulverizing mill and a conveyer for feeding material thereto, of an electric motor for simultaneously driving said mill and conveyer, an electromagnetically operated clutch interposed between said motor and said conveyer, and means for temporarily disengaging said clutch to interrupt the drive of said conveyer under given operating conditions in the grinding mill.

5. The combination with a grinding or pulverizing mill and a conveyer for feeding material thereto, of an electric motor for simultaneously driving said mill and conveyer, an electromagnetic clutch interposed between said motor and said conveyer, and means for temporarily disengaging said clutch to interrupt the drive of said conveyer under given operating conditions in the grinding mill, said means including a current relay in the motor circuit and an energizing circuit for said electromagnetic clutch adapted to be controlled thereby.

6. The combination with a grinding mill and an electric motor for continuously driving the same, of a screw conveyer for feeding material to said mill, a normally energized electromagnetic clutch for connecting said conveyer to said motor to be driven thereby, and means for temporarily deenergizing said clutch to disconnect said conveyer from said motor when the amount of material being operated upon by said mill exceeds a given value.

7. The combination with a grinding mill and an electric motor for driving the same, of a screw conveyer for feeding material to said mill, a normally energized electromagnetic clutch for connecting said conveyer to said motor to be driven thereby, and means for temporarily deenergizing said clutch when the amount of material being operated upon by said mill exceeds a given value, said means comprising a jamming relay having a winding in series with the motor circuit and a circuit for said clutch adapted to be controlled thereby.

8. The combination with a grinding mill and a continuously operated electric motor for driving the same, of a screw conveyer for feeding material to said mill, a normally energized electromagnetic clutch for connecting said conveyer to said motor to be driven thereby, and means for temporarily deenergizing said clutch when the amount of material being operated upon by said mill exceeds a given value as indicated by current conditions in the motor circuit, said means comprising a jamming relay having a winding in series with the motor circuit and a circuit for said clutch adapted to be controlled thereby.

9. The combination with a grinding mill and an electric motor for driving the same, of a screw conveyer for feeding material to said mill, a normally energized electromagnetic clutch for connecting said conveyor to said motor to be driven thereby, and means for temporarily deenergizing said clutch when the amount of material being operated upon by said mill exceeds a given value as indicated by current conditions in the motor circuit, said means comprising a jamming relay having a winding in series with the motor circuit and a circuit for said clutch adapted to be controlled thereby, said clutch and motor circuits being supplied with energy from a common source.

In witness whereof, I have hereunto subscribed my name.

WILLIAM H. COSTELLO.