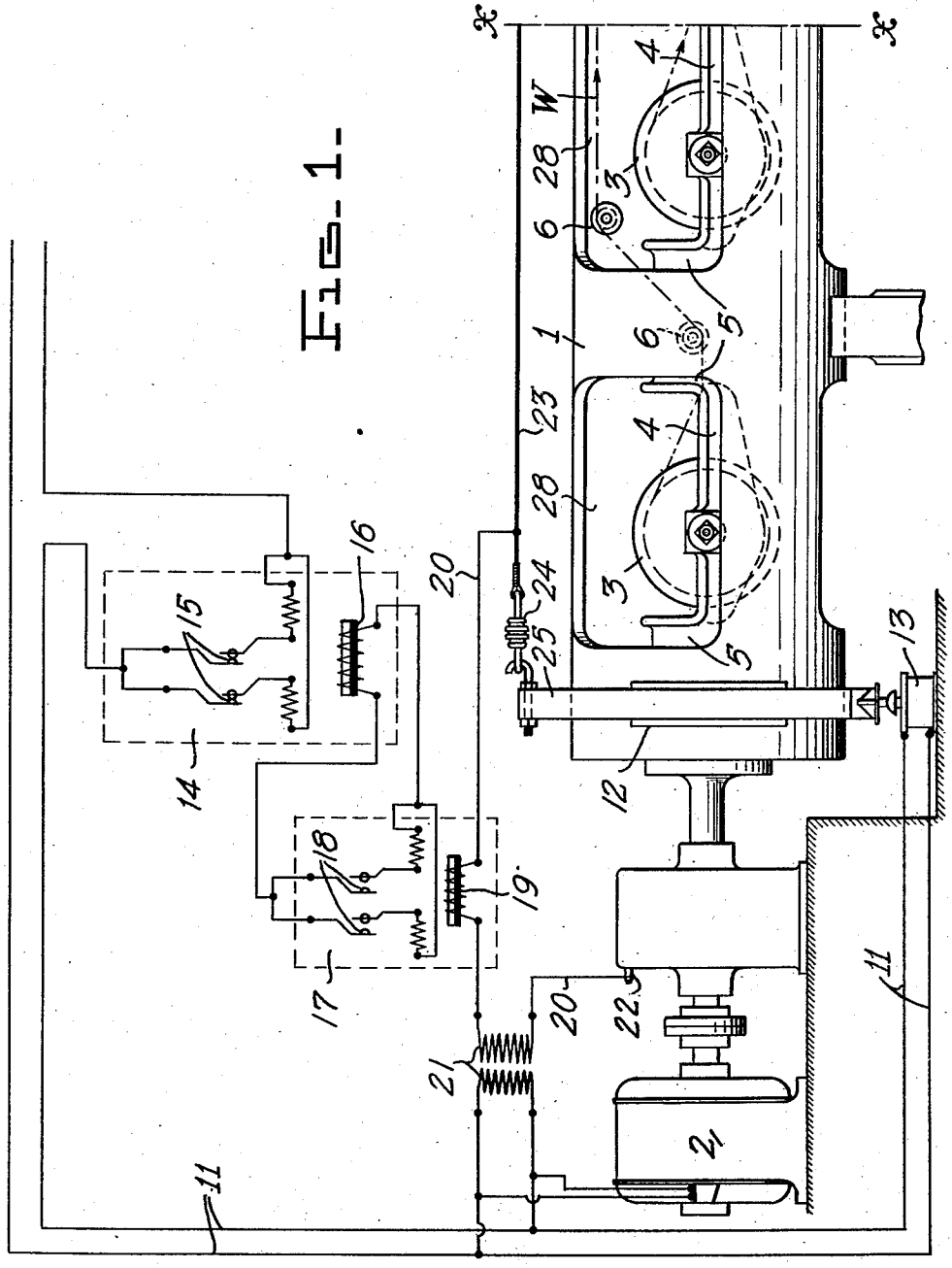
May 30, 1944. S. FEDERICO 2,349,855

BROKEN WIRE DETECTOR

Filed Feb. 10, 1943 2 Sheets-Sheet 1

FIG. 1.



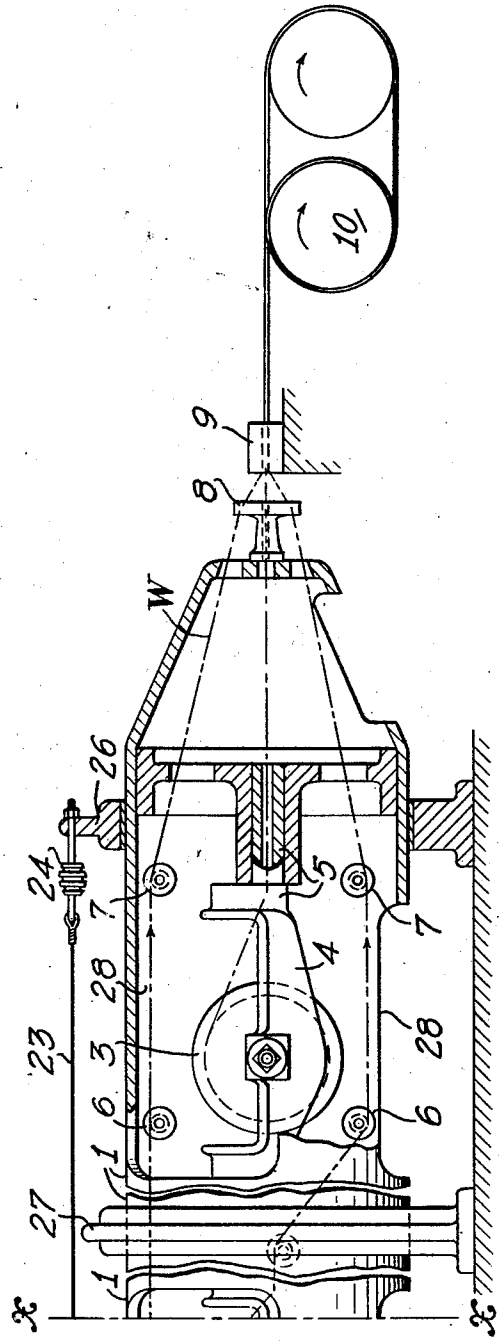
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FIG. 1a.



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Patented May 30, 1944 2,349,855

UNITED STATES PATENT OFFICE

2,349,855

BROKEN WIRE DETECTOR

Salvatore Federico, West Haven, Conn.

Application February 10, 1943, Serial No. 475,465

5 Claims. (Cl. 57—81)

This invention relates to a broken wire detector for stranding or rope laying machines. In these machines a plurality of wires or strands are drawn from spools carried by a rotor through a closing die. When one of the wires or strands is broken or when there is a spool run out, the rotor must be stopped. Various types of detectors are now used for automatically stopping the rotor when the wire breaks, but they often fail to function.

It is an object of this invention to provide automatic means for shutting down the strander which will be very sensitive to any impulse received from a wire end.

This and other objects will be more apparent after referring to the attached drawings in which

Figure 1 shows the powered end of the machine with the control in diagram form; and

Figure 1ª shows in section the opposite end, where the strand or rope is formed.

More specifically referring to the drawings, the machine includes a rotor 1 turned by a motor 2 and carrying spools of wire 3 journaled in cradles 4 supported on trunnions 5, the spools 3 remaining in vertical planes while the rotor 1 rotates. The spools 3 carry wire W which feeds over sheaves 6 longitudinally of the machine to a series of final sheaves 7 circumferentially mounted inside the rotor 1 in spaced relationship.

Upon leaving the sheaves 7, the wire from the various spools mutually approach a twister head 8 from which they pass through a closing die 9 to a power capstan 10. This capstan 10 pulls the wire, now in the form of a strand of intertwisted wires, from the die 9. This tensions the wire back to each of the various spools 3 which are braked in the usual manner.

The motor 2 is electrically powered through lines 11 going to the usual drum controller, and the rotor 1 is provided with a brake 12 of the type held released against spring tension by a solenoid 13, this solenoid being energized by the lines 11. Therefore, when the motor 2 is deenergized, the solenoid 13 is also deenergized, this causing application of the brake 12 and consequent stopping of the rotor 1.

A magnetically tripped switch 14 is arranged with its contacts 15 in circuit with the line 11, this switch having a solenoid 16 for effecting tripping and consequent opening of its contacts 15. When this occurs, the circuit through the lines 11 is interrupted so that the motor 2 is deenergized. This also deenergizes the brake solenoid 13 so as to apply the brake 12 to stop the rotor 1.

Energization of the solenoid 16 of the switch 14 is effected by a circuit controlled by a low voltage relay 17 having contacts 18 through which the solenoid 16 of the switch 14 is energized. The relay 17 has a solenoid 19 for closing its contacts 18, and this solenoid 19 is energized through lines 20 powered by the low voltage side of a transformer 21 having its high voltage side powered by the lines 11. One of the lines 20 is grounded to the rotor 1, as at 22, the other line connecting with a broken wire detector cable 23 which is supported adjacent the rotor on insulators 24 connected to bearings 25 and 26. A third bearing 27 is provided between the bearings 25 and 26.

In case a wire breaks or there is a spool run out, the end of the wire flies out through an opening 28 in the rotor 1, striking the broken wire detector cable 23, causing it to vibrate and grounding it on the bearing 27 and, hence, closing the circuit through the lines 20. This energizes the solenoid 19 which closes the contacts 18 of the relay 17, the solenoid 16 then being energized so as to trip open the contacts 15 of the magnetically tripped switch 14. As a consequence of this action, the lines 11 will deenergize, this deenergizing the motor 2 and the brake solenoid 13, whereby the brake 12 functions to immediately stop the rotor 1. At the same time, the transformer 21 is deenergized, this meaning that the entire machine is electrically dead. When the trouble is remedied, the magnetically tripped switch 14 is reset and operation of the machine resumed through the medium of the usual controller working through the lines 11.

While one embodiment of the invention has been shown and described, it will be apparent that other modifications may be made without departing from the scope of the attached claims.

I claim:

1. A stranding or rope laying machine including the combination of a rotor, means for rotating said rotor, a circuit for powering said rotating means, means mounted by said rotor for feeding lengths of material from said rotor, a control circuit, a detector in said control circuit mounted adjacent said rotor, and a stationary element in said control circuit mounted adjacent said detector, said circuit normally being open between said detector and stationary element, said detector being adapted to vibrate sufficiently to contact said stationary element to close said control circuit when struck by a loose end of said

material and thereby open said power circuit to stop the rotation of said rotor.

2. A stranding or rope laying machine including the combination of a rotor, means for rotating said rotor, a brake for said rotor, a circuit for powering said rotating means and releasing said brake, means mounted by said rotor for feeding lengths of material from said rotor, a control circuit, a detector in said control circuit mounted adjacent said rotor, and a stationary element in said control circuit mounted adjacent said detector, said circuit normally being open between said detector and stationary element, said detector being adapted to vibrate sufficiently to contact said stationary element to close said control circuit when struck by a loose end of said material and thereby open said power circuit to stop the rotation of said rotor.

3. A stranding or rope laying machine including the combination of a rotor, means for rotating said rotor, a brake for said rotor, a circuit for powering said rotating means and releasing said brake, means mounted by said rotor for feeding lengths of material from said rotor, said rotor having at least one opening therein, a control circuit, a detector in said control circuit mounted adjacent said rotor, and a stationary element in said control circuit mounted adjacent said detector, said circuit normally being open between said detector and stationary element, said detector being adapted to vibrate sufficiently to contact said stationary element to close said control circuit when struck by a loose end of said material flying through said opening and thereby open said power circuit to stop the rotation of said rotor.

4. A stranding or rope laying machine including the combination of a rotor, means for rotating said rotor, an electric circuit for powering said means, a relay for deenergizing said circuit, means mounted by said rotor for feeding wire under tension, a control circuit, a detector in said control circuit mounted adjacent said rotor, and a stationary element in said control circuit mounted adjacent said detector, said circuit normally being open between said detector and stationary element, said rotor having at least one opening therein, said cable being adapted to vibrate sufficiently to contact said stationary element to close said control circuit when struck by a loose end of said wire flying through said opening and thereby operating said relay to deenergize said circuit to stop said motor.

5. A stranding or rope laying machine including the combination of a rotor, means for rotating said rotor, a brake for said rotor, an electric circuit for powering said motor and releasing said brake, a relay for deenergizing said circuit, a spool mounted by said rotor for feeding wire under tension, a control circuit, a detector in said control circuit mounted adjacent said rotor, and a stationary element in said control circuit mounted adjacent said detector, said circuit normally being open between said detector and stationary element, said rotor having at least one opening therein, said cable being adapted to vibrate sufficiently to contact said stationary element to close said control circuit when struck by a loose end of said wire flying through said opening and thereby operating said relay to deenergize said circuit to stop said motor and apply said brake.

SALVATORE FEDERICO.