E. L. GALE, Sr.

WIRE MEASURING AND CUTTING MACHINE.

APPLICATION FILED JAN. 22, 1916.

1,288,402. Patented Dec. 17, 1918.

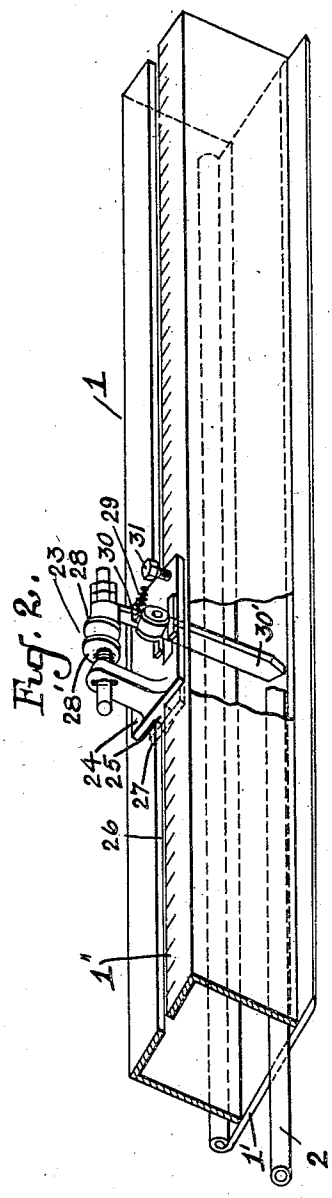


Fig. 2.

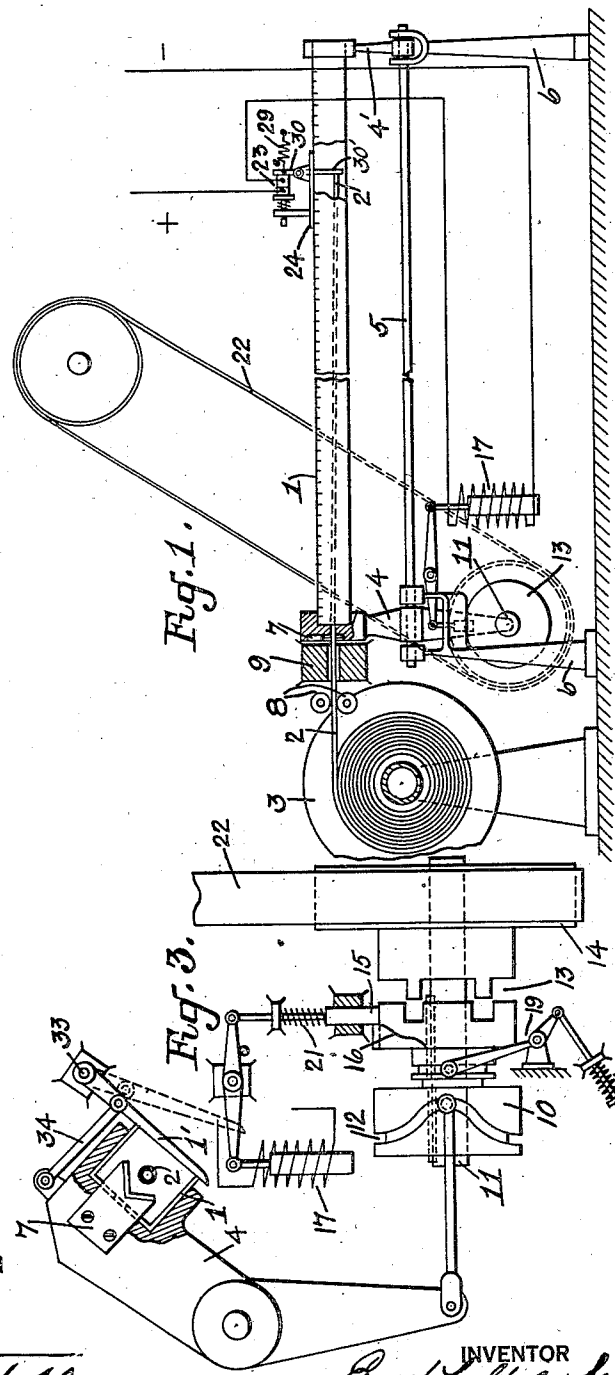


Fig. 1.

Fig. 3.

WITNESSES:

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WIRE MEASURING AND CUTTING MACHINE.

1,288,402. Specification of Letters Patent. Patented Dec. 17, 1918.

Application filed January 22, 1916. Serial No. 73,534.

To all whom it may concern:

Be it known that I, ERNEST L. GALE, Sr., a citizen of the United States, residing in Yonkers, in the county of Westchester and State of New York, have invented a new and useful Improvement in Wire Measuring and Cutting Machines, of which the following is a specification.

My invention relates to improvements in apparatus for measuring and automatically cutting material; and although it may have a general application, it is adapted for use more particularly in cases where the material required to be measured and cut is of a flexible nature, such as wire, etc.

The invention in its more essential details consists in the provision of electrical means operating in conjunction with a measuring instrument, for controlling the automatic cutting or sectioning operation of the material.

In the accompanying drawings, Figure 1 illustrates in a more or less diagrammatic manner, a general arrangement view of apparatus embodying the present invention, for measuring and automatically effecting the cutting of wire; Fig. 2 illustrates in perspective, an enlarged detail view of certain elements shown in Fig. 1; and Fig. 3 illustrates in a more or less diagrammatic manner, another view in somewhat enlarged form, of certain elements illustrated in Fig. 1.

The apparatus in detail comprises a member 1, substantially rectangular in shape, this member acting as a guide or runway through which the material to be measured and cut, such as wire 2, is fed from a reel 3. The parts forming the guide member, with the exception of the strip 1′ which forms one of the sides thereof, may be supported by a pair of rocker arms 4 and 4′, the latter being operatively connected by a rod 5 supported by suitable standards such as 6. The member 1 serves as an instrument for measuring the wire, there being provided for determining the measurement, a suitable scale face, such as is indicated at 1″.

The means employed for the purpose of cutting the wire, consists of a cutter or blade such as 7, secured to one of the lateral faces of the rocker head 4. A pair of rollers 8, and a fixed head 9, serve to guide the wire 2 from the reel into the guide or measuring instrument 1.

The rocker arm 4 is in the form of a bell-crank lever, it being operatively connected to a rotatable member 10, which may be keyed or otherwise suitably connected to a shaft 11. The member 10 is provided with a cam slot 12, through the medium of which a rocking movement of the head 4 is effected, and in this manner causes the blade 7 to cut the wire 2. A clutch mechanism of a well-known type, such as is designated by the reference numeral 13, serves to connect the shaft 11 to and disconnect it from a pulley 14, loose on the shaft 11, the pulley being in constant rotation, it being connected by a belt 22 or any other suitable means to a source of operating power.

A forward and return movement of the head 4, as effected by one complete revolution of the member 10, results in a complete cutting operation by the blade 7, this cycle of operation being controlled in part by a trip device consisting of a releasable dog 15, the latter coacting with a cam 16. The dog is released or withdrawn from engagement with the cam by means of an electromagnet 17 operatively connected therewith, to permit the engagement of the clutch sections by the pull of the spring 18 on the bell-crank lever 19. When the electro-magnet is deënergized in a manner as hereinafter pointed out, the dog is returned to normal position as indicated in Fig. 3, by the action of a spring 21, and co-acts with the cam 16 to disengage the clutch sections.

Coming now to the elements which in conjunction with the electrically controlled clutch mechanism form more particularly the subject-matter of the present invention, they consist of an electrical switch device 23, supported by a base 24. The base is made adjustable along the scale face 1″ of the member 1, by constructing the base with a tongue 25 which engages a longitudinal groove 26 in the member 1, the base being retained to the said member by means of the flanges 27 on the base, bearing on the under side of the scale face, these features of construction being clearly illustrated in Fig. 2. The switch device comprises a pair of co-acting contacts 28, 28′, these contacts being normally held open by means of a spring 29. The contact 28 is carried by a pivoted arm 30, the depending portion 30′ thereof being adapted for engagement by the wire 2, as it is fed through the member 1, the

wire in this manner actuating the arm 30 to close the contacts 28, 28'. The contacts 28, 28', control a circuit for the electromagnet 17 controlling the clutch, the contacts when closed completing the circuit for the said magnet, which will now operate automatically to effect a cutting operation of the wire, in a manner as heretofore described. It will be seen that by adjusting the base on the scale face, the length in which the wire will be cut is determined, there being provided a set-screw 31 for the purpose of retaining the base in set position.

The strip 1', with the parts in normal position as indicated in Fig. 3, forms one side of the member 1, one of its ends being pivoted at a fixed point 33, a link 34 operatively connecting the strip with the rocking head 4. With this arrangement it will be seen that as the head 4 is rocked to effect a cutting operation, the interior chamber of the member 1 is opened by the strip 1' as indicated by the dotted line position in Fig. 3, and in this manner the length of wire cut, is dropped or released by gravity from the member 1, the releasing of the wire from the member 1 allowing the spring 29 to open the switch 23, and in this manner open the circuit for the electromagnet 17.

I am aware of certain mechanical devices employed for the purpose of controlling the automatic cutting operation, but mechanical devices are found objectionable as they are limited in their use to comparatively large size wire, it being found that on account of the more flexible nature of a comparatively small size wire, as compared with a larger size wire, such mechanical devices could not be effectively actuated by the smaller size wire, this being so for the reason that the smaller size wire tends to buckle or kink in overcoming the friction and lost motion in the mechanical parts, this sometimes resulting in the wire being cut in lengths longer than intended. By the use of the present electrical means the above-noted objections are entirely overcome.

Having described the invention, what I claim as new and desire to secure by Letters Patent of the United States is:—

1. In apparatus of the class described, the combination of an electrical switch device adapted for actuation by material required to be cut, a cutter, a guideway for the material, a movable head moving both the cutter and the guideway therewith, an electromagnet in circuit with the switch device, and means operated by said electromagnet for connecting the cutter with a source of operating power.

2. In apparatus of the class described, the combination of a cutting instrument, a guideway, a movable head supporting both the cutting instrument and the guideway, power mechanism, a trip mechanism operable to connect the movable head with the power mechanism, and electrical means controlling the trip device.

3. In apparatus of the class described, the combination of a cutting instrument, a guideway, a pair of rocking arms supporting the guideway, one of the said arms also carrying the cutting instrument, power mechanism, a trip device operable to connect the rocking arms with the power mechanism, and electrical means controlled by the material required to be cut controlling the trip device.

4. In apparatus of the class described, the combination of a cutting instrument, a movable head carrying the said instrument, means actuated by the movable head to form an open and closed chamber adapted to form a guideway for the material required to be cut, power mechanism, a trip device operable to connect the cutting instrument with the power mechanism, an electromagnet operating the trip device, and a switch device adapted for actuation by the material required to be cut and controlling a circuit for the trip device.

5. In apparatus of the class described, the combination of a power-operated cutter, means forming a guideway for material required to be cut, said guideway forming a chamber which is opened and closed by movement of the cutter, and an electric switch adjustably supported by the guideway.

6. In apparatus of the class described, the combination of a power-operated cutter, a guideway for material required to be cut, said guideway forming a chamber which is opened and closed by movement of the cutter, an electric switch supported by the guideway adapted for actuation by the material to be cut, and an electromagnetic device controlled by the switch for effecting an automatic operation of the cutter.

7. In apparatus of the class described, the combination of a rocking head carrying a cutter blade, means movable with the head forming a guideway for material required to be cut, and an electrical device adjustably supported by the guideway adapted for actuation by the material to be cut, to effect a cutting operation.

8. In apparatus of the class described, the combination of a movable head carrying a cutter, means movable with the head forming a guideway for material required to be cut, an electric switch adjustably supported by the guideway adapted for actuation by the material, a source of operating power, and an electroresponsive device having a circuit controlled by the said switch and operable to effect a connection between the cutter head and operating power.

9. In apparatus of the class described, the combination of a movable head carrying an

instrument for cutting wire, means movable with the head for guiding wire past the cutting instrument from a fixed guiding element, a switch adapted for actuation by the wire, a source of operating power, an electromagnet having a circuit controlled by the said switch and operable to effect a connection between the cutter head and source of power, and means automatically to effect the release of the wire from the movable guide.

10. In apparatus of the class described, the combination of a power-operated wire cutter, a member forming a chamber into which the wire is fed, an electrical switch device comprising a switch arm depending into the chamber for engagement by the said wire, and means for adjustably retaining the switch device to the guideway.

11. In apparatus of the class described, the combination of a power-operated wire cutter, a member forming a chamber into which the wire is fed, and an electric switch slidably supported by the guiding member, the said switch comprising a pivoted arm depending into the chamber for engagement by the said wire.

12. In wire cutting apparatus, the combination of a rectangular member forming a guide for material required to be cut, and an electric switch device carried by a base, the rectangular member being constructed with a slot to slidably retain the base thereon.

13. In wire cutting apparatus, the combination of a rectangular member forming a guide for the wire required to be cut, said member having a slot, an electrical switch, and a base supporting the said switch, the said base being slidably retained to the rectangular member and engaging the said slot.

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses.

ERNEST L. GALE, Sr.

Witnesses:
Schuyler Phillips,
George D. Rose.