April 18, 1933. DE HART G. SCRANTOM 1,904,254

APPARATUS FOR MARKING STRAND MATERIAL

Filed Sept. 30, 1929

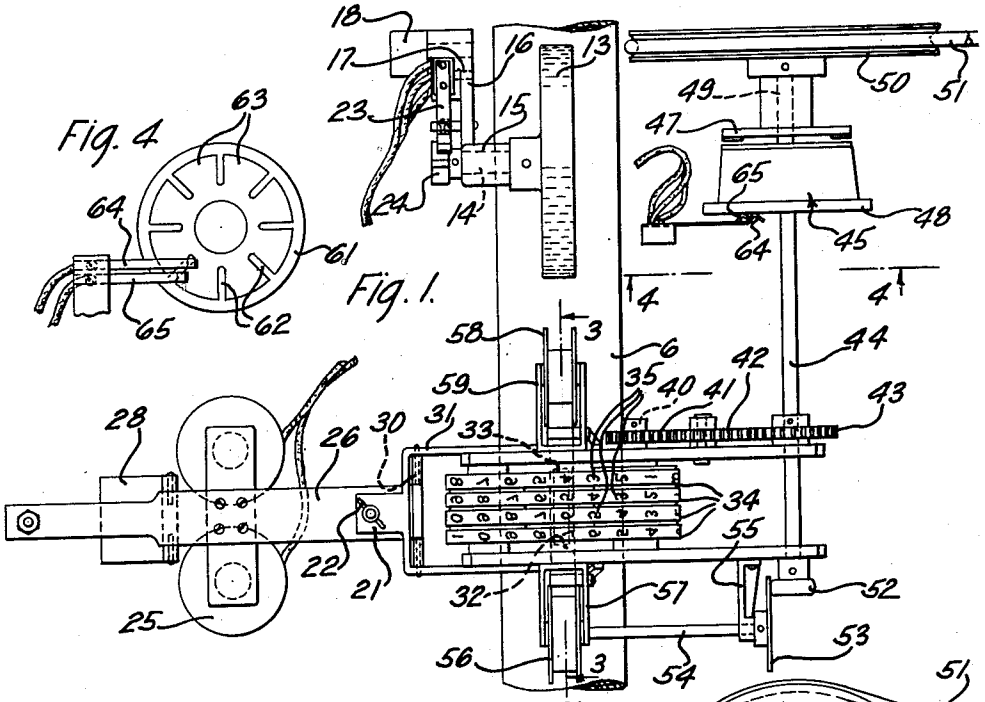


Fig. 1.

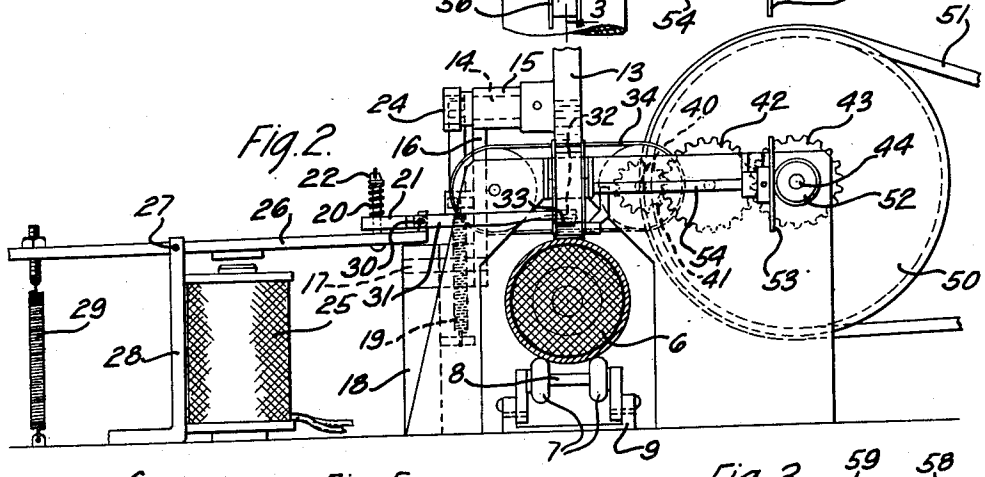


Fig. 2.

Fig. 4

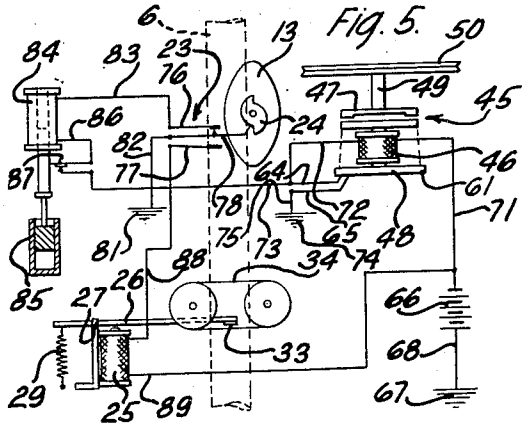


Fig. 5.

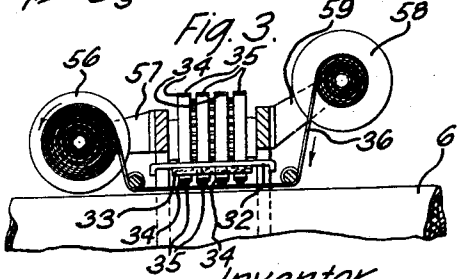


Fig. 3.

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Patented Apr. 18, 1933 1,904,254

UNITED STATES PATENT OFFICE

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APPARATUS FOR MARKING STRAND MATERIAL

Application filed September 30, 1929. Serial No. 396,127.

This invention relates to apparatus for marking strand material, and more particularly to apparatus for measuring and marking length indications on cable cores and similar strand material.

An object of this invention is the provision of simple and efficient apparatus for accurately measuring and indicating a dimension of strand material.

In accordance with one embodiment, the invention contemplates the provision of a measuring wheel for engaging a surface of the cable core or other strand being measured and being rotated thereby. The measuring wheel is provided with a cam for controlling electrical contacts which upon closure operate an electromagnetic stamping device, the armature of which carries a hammer which upon actuation engages with a snap action the rear surfaces of a plurality of parallel endless tapes having numerals embossed thereon. An inked ribbon is positioned between the tapes and the strand being measured for printing a length indication upon the strand when the hammer strikes the tapes, without interfering with the advancement of the strand.

The cam on the measuring wheel also controls a circuit for causing the advancement of the tapes which are interconnected in the usual manner of counters, so that for each unit of length of the strand a numeral is indexed into place under the hammer for printing, which numeral corresponds with the units of length of the cable core which have been measured by the apparatus.

Other objects and advantages of the invention will become apparent from the following detailed description, taken in conjunction with the accompanying drawing, wherein

Fig. 1 is a plan view of apparatus embodying the features of the invention;

Fig. 2 is an end elevational view of the structure shown in Fig. 1;

Figs. 3 and 4 are fragmentary transverse sectional views taken on the lines 3—3 and 4—4, respectively, of Fig. 1 in the direction of the arrows, and

Fig. 5 is a schematic circuit diagram of the electrical circuit which controls the operation of the apparatus shown in Figs. 1, 2, and 3.

Referring now to the drawing wherein like reference characters designate the same parts throughout the several views, the numeral 6 designates a cable core which may be supported in any suitable manner, but which is herein shown as being supported by a pair of rolls 7—7 rotatable about a shaft 8 which is supported in a framework 9.

A measuring wheel 13, which in the particular embodiment herein described is two feet in circumference, bears upon the upper surface of the cable core and is frictionally rotated thereby. The measuring wheel is supported on a shaft 14 which is journaled in a bearing 15 formed on the upper end of a lever 16. The lever 16 is pivoted at 17 upon a standard 18 and is drawn downwardly by a spring 19 for insuring a good frictional contact between the wheel 13 and the cable core 6.

The lever 16 also supports an electrical switch 23 (Fig. 5), an extension of which engages a cam 24 secured to the shaft 14 so that upon each revolution of the measuring wheel 13 the cam 24 will operate the switch 23 twice, so that the control circuits necessary for the actuation of the printing mechanism and the mechanism for advancing the tapes will be actuated.

The printing mechanism by means of which the numbers designating the length of the cable core are imprinted upon the cable core comprises an electromagnet 25 having an armature 26 which is pivoted at 27 on a bracket 28 mounted closely adjacent the electromagnet. Affixed to the left end (Figs. 2 and 5) of the armature 26 is an adjustable tension spring 29 which normally serves to maintain the armature 26 in a position away from the magnet 25. The opposite end of the armature 26 is bent upwardly to provide a support on which a U-shaped hammer 31 may be pivoted as shown at 30. Across the open end of the U-shaped hammer 31 a bar 32 is positioned, which bar has a facing 33 of cork secured to the underside thereof. A spring 20 positioned between a projecting portion 21 of the hammer 31 and a thumb nut 22 threadedly attached to the armature 26 normally holds the hammer parallel to the ar-

mature. Thus it will be apparent that upon energization of the electromagnet 25, the cork faced hammer will be moved downwardly until the armature 26 strikes the core of the electromagnet when the momentum of the hammer will cause it to compress the spring and snap the hammer head downwardly and the spring will return it quickly to its former position immediately after it has struck a blow.

The armature of the electromagnet is so arranged that the cork faced hammer head extends longitudinally of the cable core 6 and is positioned immediately above the lower portions of the series of endless tapes 34 which in the particular embodiment disclosed herein number four. The endless tapes 34 have embossed thereon numerals 35—35 running consecutively from zero to nine and are interconnected by any suitable type of gearing or other mechanism which will cause the tapes to advance at varying speeds and in the ratio of ten to one, so that the movement of the upper tape as viewed in Fig. 1 to successively carry ten numerals into alignment with the cork faced hammer head will cause the second tape to advance one digit, and the movement of the second tape to carry ten numerals successively past the position of the hammer head will cause the third tape to advance one digit, and so on. Since mechanism of this type is well known to the art of counters and for the sake of clarifying the drawing, the particular mechanism for causing this movement of the tapes has not been shown herein.

Extending immediately below the tapes having the numerals embossed thereon is an inked ribbon 36, of the type used in typewriting mechanisms, which is moved, in a manner described in detail hereinafter, transversely of the tapes so as to present a freshly inked portion of the ribbon under the embossed numerals. It will be apparent by reference to Figs. 2 and 3 that the inked ribbon 36 is adjacent the cable and that the embossed tapes are positioned immediately above the ribbon so that upon movement of the cork faced hammer head downwardly the hammer head will engage the embossed tapes causing them to strike the inked ribbon which will in turn be moved into engagement with the cable core to imprint a numeral thereon, depending upon the numerals which are embossed on the tape at the position adjacent the cork faced hammer head.

The mechanism for advancing the tapes, as pointed out hereinbefore, is of any suitable type which may be used for counting mechanisms and the first tape is actuated by the following described mechanism: A shaft 40 is attached directly to the first tape actuating roll and carries a gear 41 which meshes with an idler gear 42 which in turn meshes with a gear 43 mounted upon a shaft 44. The shaft 44 is connected to an electromagnetic clutch mechanism 45 (Figs. 1 and 5) of any suitable type composed of an actuating coil 46, a driving member 47, and a driven member 48, and is adapted to be rotated upon energization of the actuating coil of the clutch 45. The clutch upon energization will interconnect the shaft 44 with a constantly driven shaft 49 to which is attached a pulley 50 driven by a belt 51 connected to a motor (not shown). The other end of the shaft 44 carries a friction roller 52 which bears upon the face of the disc 53 secured to a shaft 54 which is journaled in a bracket 55. A take-up spool 56 is secured to the other end of the shaft 54 which at that end is journaled in a bracket 57. The take-up spool 56 draws the inked ribbon 36 from a supply spool 58 rotatably mounted in a bracket 59.

Positioned upon the driven member 48 of the clutch 45 is a contact operating member 61 (Fig. 4) which consists of insulating portions 62 and conducting portions 63 with which are associated contact brushes 64 and 65. By referring to Fig. 4, it will be apparent that rotation of the driven member 48 will alternately electrically interconnect and disconnect the brushes 64 and 65 when the conducting portions 63 and insulating portions 62, respectively, are rotated into association with the brushes.

The contact operating member 61 controls the completion of circuits which insure the positive indexing of the tapes to bring a numeral embossed thereon directly under the hammer head between strokes of the hammer. The circuits so controlled comprise a source of electromotive force 66, one side of which is connected to ground at 67 through a conductor 68 and the other side of which is connected to one end of the windings 46 of the electromagnetic clutch 45 through a conductor 71. A conductor 72 connects the other end of the windings of the clutch to a conductor 73 attached to the brush 64. It will thus be apparent that if the electromagnetic clutch is energized momentarily in a manner to be described hereinafter, one of the conducting portions 63 of the contact operating member 61 will be moved into engagement with the brushes 64 and 65, thus completing a circuit from the grounded source of electromotive force 66 through the windings of the electromagnet 45 to the brush 64 and through the conducting portion 63 to the brush 65 which is connected to ground at 74 by a conductor 75. The completion of this circuit causes a predetermined amount of rotation of the driven shaft 44 and hence causes a corresponding movement of the tapes upon the momentary energization of the clutch.

The cam 24 actuates the switch 23 which controls the operation of the electromagnet 25 and the momentary energization of the

electromagnetic clutch 45. This switch comprises a pair of fixed contacts 76 and 77 and a movable contact 78 which is moved by the cam 24 alternately into engagement with each of the fixed contacts upon rotation of the measuring wheel 13. The movable contact 78 of the switch 23 is connected to ground at 81 by a conductor 82 and upon movement upwardly engages the fixed contact 76 to connect ground through a conductor 83 to a slow-acting relay 84, the movement of which is retarded by a dash pot 85. The relay 84 is connected to the grounded source of electromotive force 66 through a conductor 86, a switch 87, which is opened upon energization of the relay, the conductors 72 and 73, the windings of the electromagnetic clutch 45 and the conductor 71. This circuit, it will be seen, in each half revolution of the wheel 13 energizes the relay 84 and the clutch 45 momentarily and then through the actuation of the relay opens the switch 87 to break the circuit to the electromagnetic clutch 45 and the relay. However, the clutch will be held in its engaged position for a predetermined portion of the revolution of the driving member of the clutch by the circuit which includes the contact operating member 61.

Movement of the contact 78 downwardly by the cam 24 completes a circuit momentarily, due to the conformation of the cam, from ground 81 through the contact 77 of the switch 23, a conductor 88 to the relay 25 which is connected to the grounded source of electromotive force 66 by a conductor 89 and the conductor 71.

It is believed that a better understanding of the invention will be had by reference to the following brief description of the operation thereof: A cable core 6 in being moved past the measuring wheel 13 will cause the wheel 13 to rotate once for each two feet of cable core length and since the wheel 13 actuates the cam 24 which in turn operates the switch 23 twice for each revolution thereof, it will be apparent that two complete cycles of operation of the mechanism controlled by the switch 23 will be effected by each revolution of the measuring wheel 13. The switch 23 in each cycle of operation completes circuits momentarily for connecting the driven shaft 44 to the constantly rotating shaft 49 to advance the tapes having the numerals 35 embossed thereon so as to bring a number one unit higher than the preceding number into alignment with the cork faced hammer head. Immediately after such a circuit has been completed the cam 24 will complete a circuit to energize the electromagnet 25 which will snap the cork faced hammer head into engagement with the upper side of the embossed tape, Fig. 2, whereupon the tapes will engage the inked ribbon and drive it into engagement with the cable core to imprint a length indication thereon.

What is claimed is:

1. A strand measuring apparatus comprising an embossed printing tape, a hammer associated therewith, and means controlled by the strand for causing the hammer to strike the tape for printing a designation on the strand.

2. A strand measuring apparatus comprising a plurality of embossed numbering tapes, a cork faced hammer associated therewith, and means controlled by the strand for causing the hammer to strike the tapes sharply for printing a length indication on the strand.

3. A strand measuring apparatus comprising a plurality of movable endless embossed numbering tapes, a hammer for engaging the tapes to print an indication of length on the strand, and means engaging the strand and actuated thereby for controlling the operation of the tapes and the hammer.

4. A strand measuring apparatus comprising a plurality of endless embossed numbering tapes, an electromagnetic hammer for moving the tapes into engagement with a strand being measured to imprint an indication of length on the strand, means for advancing the tapes, and means for controlling the means for advancing the tapes and for controlling the actuation of the hammer.

5. In a strand measuring apparatus, means engaging the strand and rotatable thereby upon movement thereof, a registering mechanism including an endless tape controlled by said means engaging the strand for registering units of strand length, and means including an impact delivering member also controlled by said means engaging the strand for causing the registering mechanism to inscribe length indications upon the strand.

6. In a strand measuring apparatus, a printing mechanism including an endless tape and an impact delivering member adapted to register units of strand length, means for actuating the printing mechanism to cause it to inscribe length indications on the strand, and means independent of the actuating means for indexing the printing mechanism.

7. In a strand measuring apparatus, means for measuring and marking length indications on strands comprising a plurality of endless embossed numbering tapes, a snap operated cork faced hammer for engaging the tapes to print a length indication on the strand, constantly rotating means for actuating the tapes, means momentarily operable for interconnecting the tapes and the constantly rotating means, means for insuring the rotation of the tapes a predetermined amount independently of the momentarily operable means, means for actuating the hammer, means for controlling the operation of the momentarily operable means and the means for actuating the hammer, a cam for

actuating said control means, and means engaging the strand being measured for actuating the cam.

8. In a strand measuring apparatus, means engaging the strand and rotatable thereby upon relative movement between the strand and said means engaging the strand, a registering mechanism including an endless tape controlled by said means engaging the strand for registering units of strand length, and means including a hammer also controlled by said means engaging the strand for causing the registering mechanism to inscribe length indications upon the strand.

9. In a strand measuring apparatus, means for imprinting length indications on the strand including an electromagnet, an armature associated therewith, means pivoted to said armature, and resilient means for holding the pivoted means normally parallel to the armature and upon energization of the magnet causing the pivoted means to snap downwardly and quickly return.

10. In an apparatus for marking a moving strand, strand marking means including an endless tape, and means including an impact delivery member controlled by the strand for periodically engaging the tape with the strand to mark the strand.

11. In an apparatus for marking a moving strand, strand marking means, and actuating means therefor including an oscillatable member, electromagnetic means for operating the member, an actuating element carried by the member and movable therewith, a flexible connection between the member and the actuating element, and resilient means for effecting a quick return movement of the actuating element independently of the movement of the member.

12. In an apparatus for marking a moving strand, strand marking means comprising an endless tape, and actuating means therefor including a circular member rotatably engageable with the moving strand, means associated with the circular member for periodically closing an electrical circuit, electromagnetic means included in the electrical circuit and operable upon closure thereof, and means comprising an impact delivery member flexibly connected to the electromagnetic means for engaging the strand marking means with the strand.

13. In an apparatus for marking a moving strand, strand marking means including an endless tape carrying marking characters, and actuating means therefor including a rotatable member frictionally engaging the moving strand, means associated with the rotatable member for periodically closing an electrical circuit, electromagnetic means included in the electrical circuit and operable upon closure thereof, and a hammer flexibly connected to the electromagnetic means for engaging the tape with the strand to apply an indication of length on the strand.

In witness whereof, I hereunto subscribe my name this 16th day of September, A. D. 1929.

DE HART G. SCRANTOM.