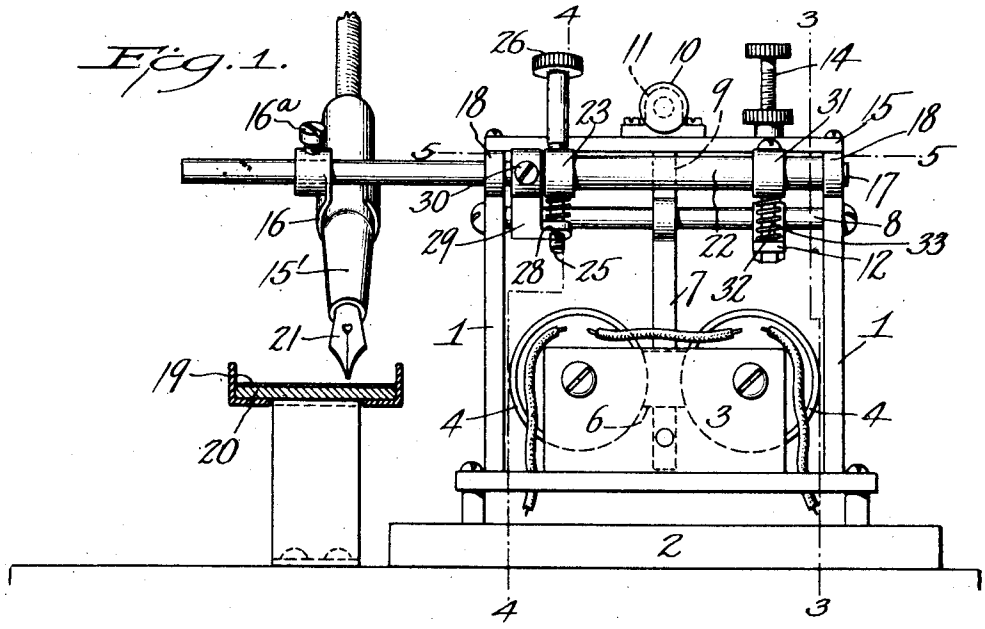
June 25, 1929. C. J. KORNDORFER ET AL 1,718,742

TELEGRAPHIC RECORDING INSTRUMENT

Filed June 24, 1927 2 Sheets-Sheet 1

Fig. 1.



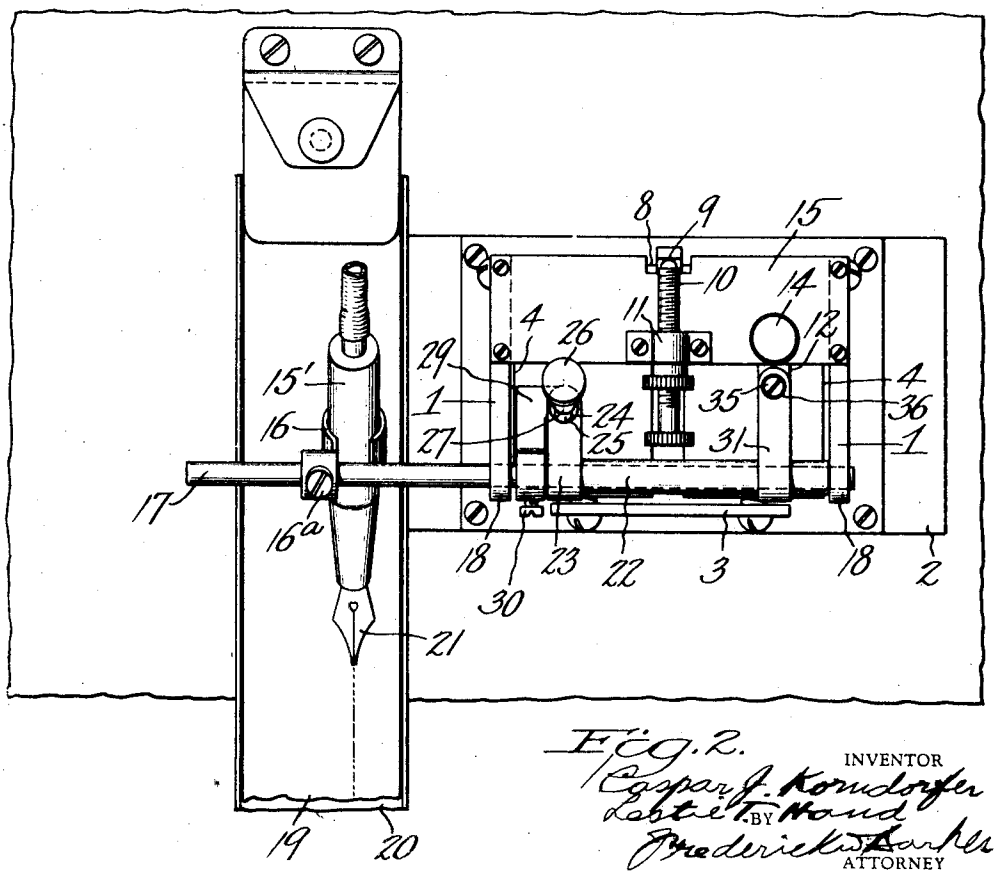


Fig. 2.

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Fig. 3.

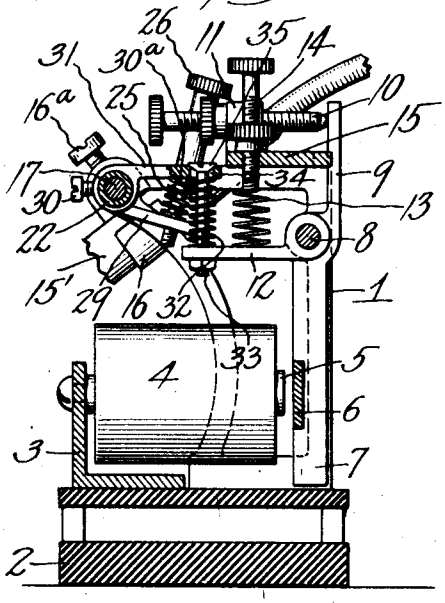


Fig. 5.

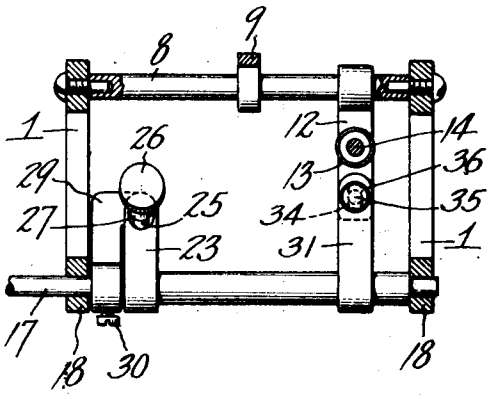


Fig. 4.

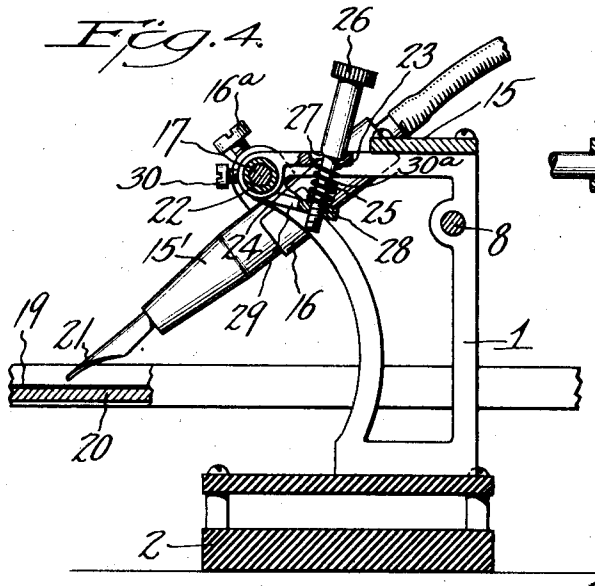
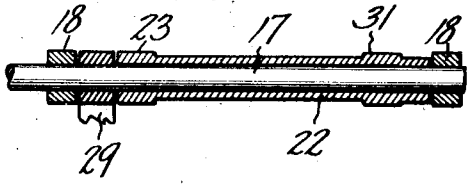


Fig. 6.



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UNITED STATES PATENT OFFICE.

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TELEGRAPHIC RECORDING INSTRUMENT.

Application filed June 24, 1927. Serial No. 201,146.

This invention relates to electro-magnetically operated apparatus for use in recording telegraphic communications such as are represented by the Morse code, and our improvements are directed particularly to certain new and useful features whereby such apparatus is rendered more positive in its operation, wherein the recording devices can be adjusted to bear with the precise degree of tension on the paper strip for creating thereon exactly uniform markings, and to minimize the frictional wearing effect upon the table in travel of the paper strip along its surface, thereby enhancing the durability thereof, and maintaining a state of high efficiency for the apparatus.

Other features and advantages of our invention will hereinafter appear.

In the drawings:

Figure 1 is a front elevation of our improved recording apparatus.

Fig. 2 is a top plan view thereof.

Fig. 3 is a side elevation, partly in section, taken on the line 3—3 of Fig. 1.

Fig. 4 is a similar view, taken on the line 4—4 of Fig. 1.

Fig. 5 is a horizontal view partly in section taken on the line 5—5 of Fig. 1, and

Fig. 6 is a detail view of the pen carrying shaft and its sleeve.

In said views let 1 indicate the frame of the apparatus, mounted on base 2.

Supported on base 2, as by bracket 3, are horizontally disposed electro-magnets 4, whose cores 5 are opposed to the armature 6 that is carried by a vertically disposed arm 7, which latter is fixed on a shaft 8 that is oscillably mounted in the frame. Also carried by shaft 8 is an upwardly extending member 9, whose inner surface is opposed to a screw 10 that is threaded through a frame portion 11 and serves as an adjustable stop to limit the degree of movement of the armature away from the magnet.

Also the shaft 8 carries a horizontal arm 12 that serves as a base support for a helical spring 13, with which latter a screw 14, threaded through a frame portion 15, is engaged, the function of said spring being to provide the tension by which the armature is retracted from the magnet when the flow of magnetic current is interrupted. As will be perceived screw 14 enables the degree of tension exercised by spring 13 to be adjusted to suit the service conditions. The recording device, here shown as pen 15′, is connected as by a clip 16 to a shaft 17 that is mounted in bearings 18 provided therefor in the frame, the clip being secured to the shaft by a screw 16^a.

The pen 15 is shown as angled toward the usual recording strip of paper 19 that moves along a supporting table 20 to receive markings that are imposed thereon by the pen point 21 in the operation of the device. The shaft 17, it will be noted, is in parallelism with shaft 8 and is in spaced relation thereto. In consequence the oscillations of shaft 8 imparted to it by the armature are not directly communicated from shaft 8 to the pen, but are transmitted thereto by certain intermediary mechanism which will now be described. Loosely fitting shaft 17 is a sleeve 22, to which is fixed a bracket 23 having an orifice 24, for the passage of the reduced portion 25 of a screw member 26, a shoulder 27 on said member providing a stop to retain the shank on the upper surface of bracket 23. The threaded portion 25 of the screw member, however engages a threaded orifice 28 in a lower bracket 29 that is secured as by screw 30 to shaft 17, so that by means of a helical spring 30^a around screw member 26, intermediate brackets 23, 29, shaft 17 and sleeve 22 are tensionally connected, and the pen point can be adjusted in its spaced relation with respect to the paper strip by manipulation of screw member 26. With the operative connection thus established between shaft 17 and sleeve 22, our invention contemplates the provision of cushioned transmitting means, or transmitting means including a yieldable interponent, between the armature shaft 8, (which may be termed a rock shaft) for communicating to sleeve 22, and thence through shaft 17 to the pen, the magnetically controlled oscillations that cause the pen to record the instrument readings. This transmitting mechanism we have devised in the form of a horizontal arm 31, fixed upon sleeve 22 and extended rearwardly to lie above the free end of arm 12, in spaced relation therewith. A helical spring 32 spans the space between arms 31 and 12, and a pin 33, secured to arm 12, extends through spring 32 and into

an orifice 34 in an arm 31, said pin having a head 35 that engages in a seat 36 provided in the upper surface of arm 31.

The cushioned transmitting means thus described is intended to prevent the pen from pressing with excessive force upon the paper, and we have found by long continued practice that it enables the device to operate with a high degree of efficiency and speed, the pin or stem 33 being free to ride through orifice 34 while spring 32 yields as the oscillations of shaft 17 are cushioned in their transmission to the pen in its contact with the recording surface. This arrangement avoids any occasion for manual adjustment through screw 26 which otherwise would arise due to fluctuations in the load through the operating circuit.

The screw member 26 adjusts the position of the pen point in its spaced relation to the paper. This spacing need not correspond in extent with that traversed by the armature in its movements to and from the magnet, because any excessive motion transmitted by shaft 8 will be neutralized by spring 32, which serves as a cushion, the tension of said spring permitting the pen to have sufficient bearing contact with the paper to make clear and legible markings thereon, while eliminating any possibility of the pen pressing with such force on the paper as to injure the pen point or create too heavy markings.

Another useful function provided by the use of separate shafts for the armature and pen is that thereby said shafts may rock through arcs of different extent, whereby a relatively small path of travel may be provided for the armature to and from the magnet without unduly limiting the pen movement. This is desirable for the obvious reason that the armature will thus be more strongly and positively influenced by the magnetic force accordingly as it is located normally in close operative relation to the magnet. In the example of our invention herein illustrated the co-action between the relatively long arm 12, extended from shaft 8, and the relatively short arm 31, extended from sleeve 22, tends to transmit rocking motion to shaft 17 of greater extent than that established in shaft 8 by the armature. Therefore, as will be perceived, we have provided an organism wherein the armature shaft may rock through an arc best suited to the efficient operation of the electro-magnet, and the pen carrying shaft may rock through an arc of different extent best suited to the efficient operation of the pen.

Also the cushioning means controlling the pressure contact had by the pen upon the paper has the further and important function of preventing the paper strip, in its travel over the surface of the table, from exerting undue frictional pressure thereon. In devices of this character, not equipped with our improved cushioning means, the frictional wear upon the table is considerable and requires frequent readjustments to be made to maintain the correct operative relation between the pen and paper; and besides a cavity beneath and around the point of pen contact soon forms in the table surface under conditions heretofore prevailing.

Variations within the spirit and scope of our invention are equally comprehended in the foregoing disclosure.

We claim:

1. A recording instrument comprising an electro-magnet, an armature therefor, a shaft oscillatory with said armature, a pen, an oscillatory shaft carrying said pen, said shafts being in spaced parallelism, and means for transmitting movement from said armature shaft to said pen carrying shaft.

2. A recording instrument comprising an electro-magnet, an armature therefor, a shaft oscillatory with said armature, a pen, an oscillatory shaft carrying said pen, and means for transmitting movement from said armature shaft to said pen carrying shaft, said movement transmitting means including a yieldable interponent.

3. A recording instrument comprising an electro-magnet, a shaft oscillable with said armature, a pen, a strip of paper movable beneath said pen, an oscillatory shaft carrying said pen, a sleeve upon said pen-carrying shaft, tensional engaging means between said sleeve and pen carrying shaft to adjust the relation of said pen to said strip of paper, and means for transmitting movement from said armature shaft to said sleeve.

4. A recording instrument comprising an electro-magnet, a shaft oscillatory with said armature, a pen, a strip of paper movable beneath said pen, an oscillatory shaft carrying said pen, a sleeve upon said pen-carrying shaft, tensional engaging means between said sleeve and pen carrying shaft to adjust the relation of said pen to said strip of paper, and means for transmitting movement from said armature shaft to said sleeve, said movement transmitting means including a yieldable interponent.

5. A recording instrument having a frame, a horizontally disposed electro-magnet thereon, a horizontal shaft oscillatively mounted in said frame, an armature carried by said shaft to coact with said magnet, a horizontal arm extended from said shaft, a spring bearing upon said arm to hold said armature normally away from said magnet, a vertically disposed screw threaded through said frame and engaged with said spring to regulate its tension, a pen, a pen carrying shaft oscillatively mounted in said frame, and means intermediate said shafts to transmit movement from said armature to said pen.

6. A recording instrument having a frame, a horizontally disposed electro-magnet thereon, a horizontal shaft oscillatively mounted in said frame, an armature carried by said shaft to co-act with said magnet, tensional means to hold said armature normally away from said magnet, an arm extended vertically from said shaft, a horizontally disposed screw threaded through said frame in opposed relation to said arm to adjustably limit the armature movement, a pen, a pen carrying shaft oscillatively mounted in said frame, and means intermediate said shafts to transmit movement from said armature to said pen.

7. The combination in a recording instrument having an electro-magnet, an armature co-operating therewith, and a shaft oscillatory with said armature, of a spring, means upon said shaft to support said spring, a pen, and a pen carrying oscillable shaft in actuable relation with said spring, whereby movement of said armature is yieldingly transmitted to said pen.

8. The combination in a recording instrument having an electro-magnet, an armature co-operating therewith, a pen, and a shaft oscillatory with said armature, of a pen carrying shaft, a sleeve thereon, means of adjustable tensional engagement between said pen carrying shaft and sleeve, an arm extended from said armature shaft, an arm extended from said sleeve and provided with an orifice, a spring disposed between said arms and a guide pin secured to said first named arm and movable through the orifice in said second named arm, whereby movement of said armature is yieldingly transmitted to said pen.

New York, June 21st, 1927.

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