

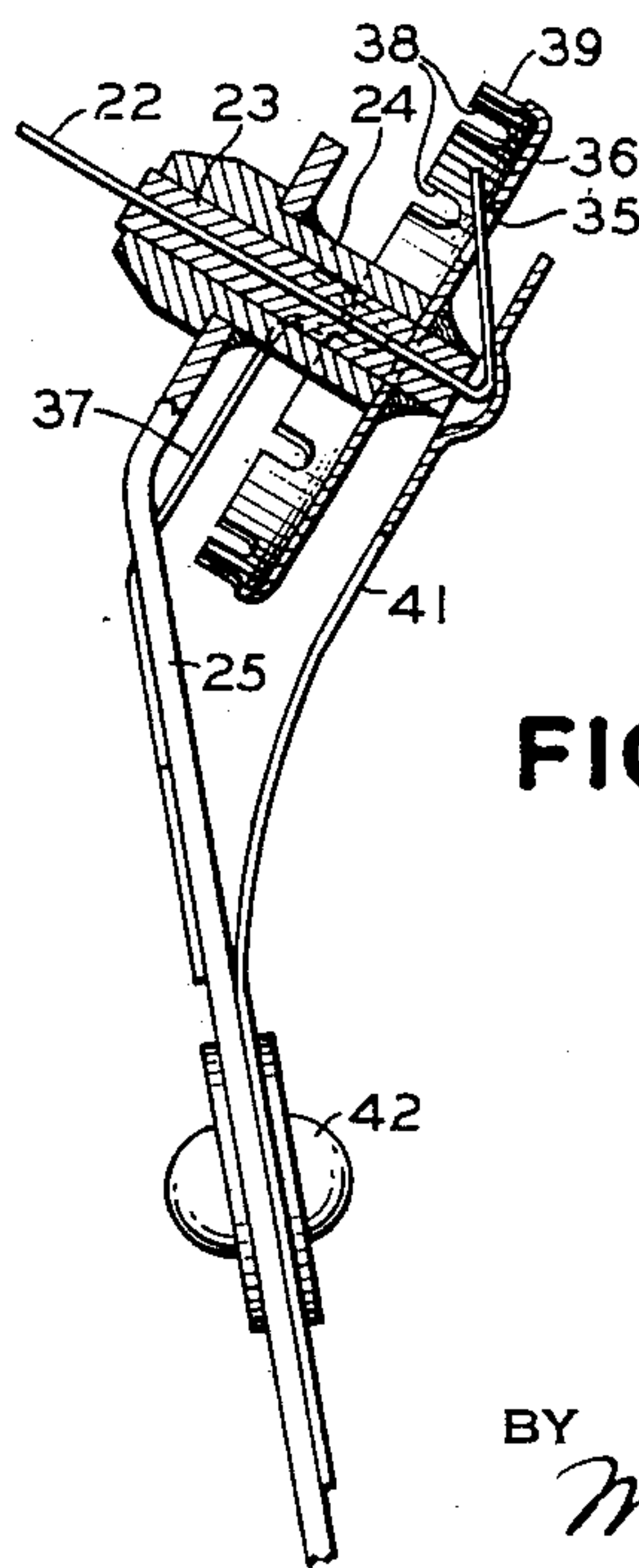
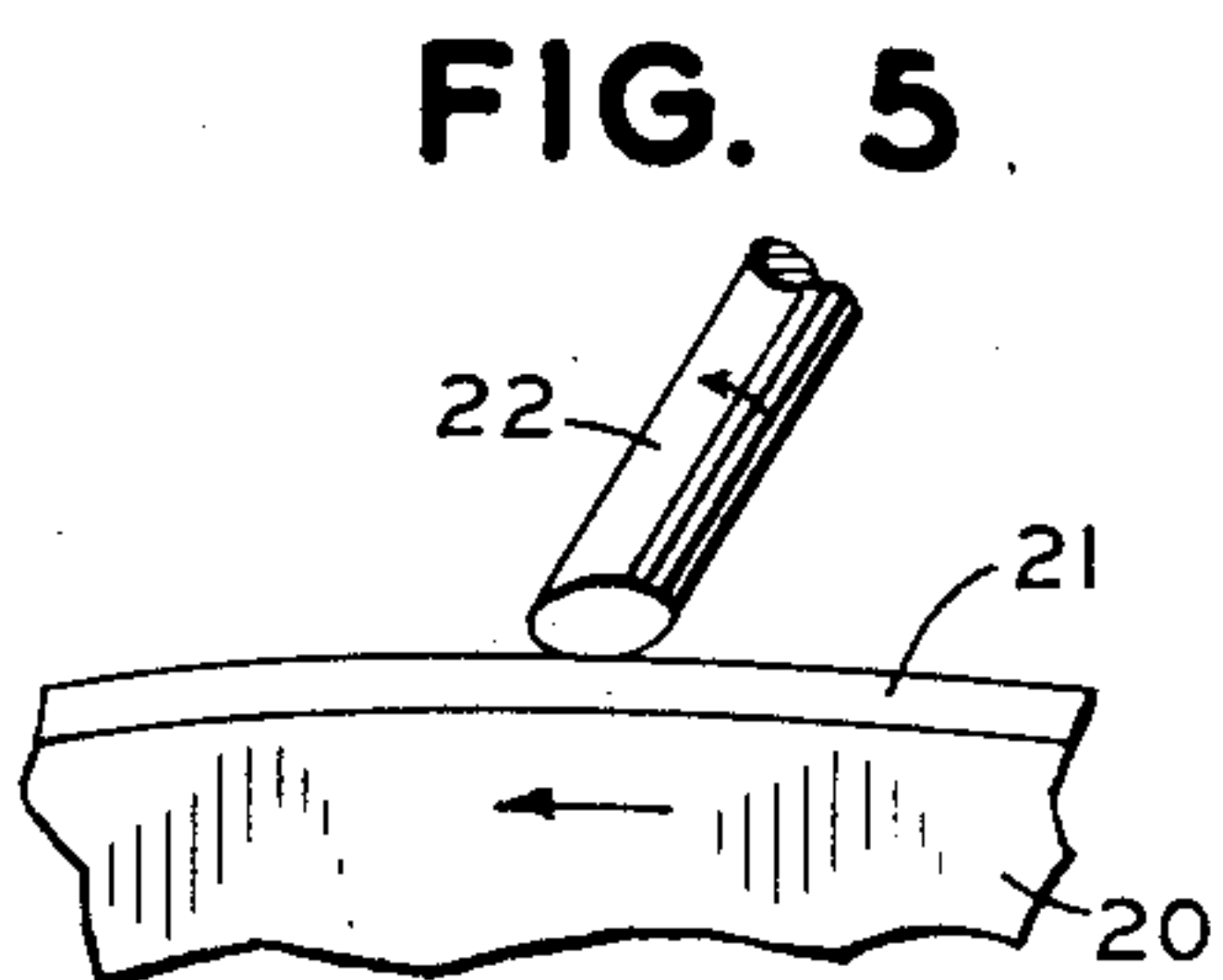
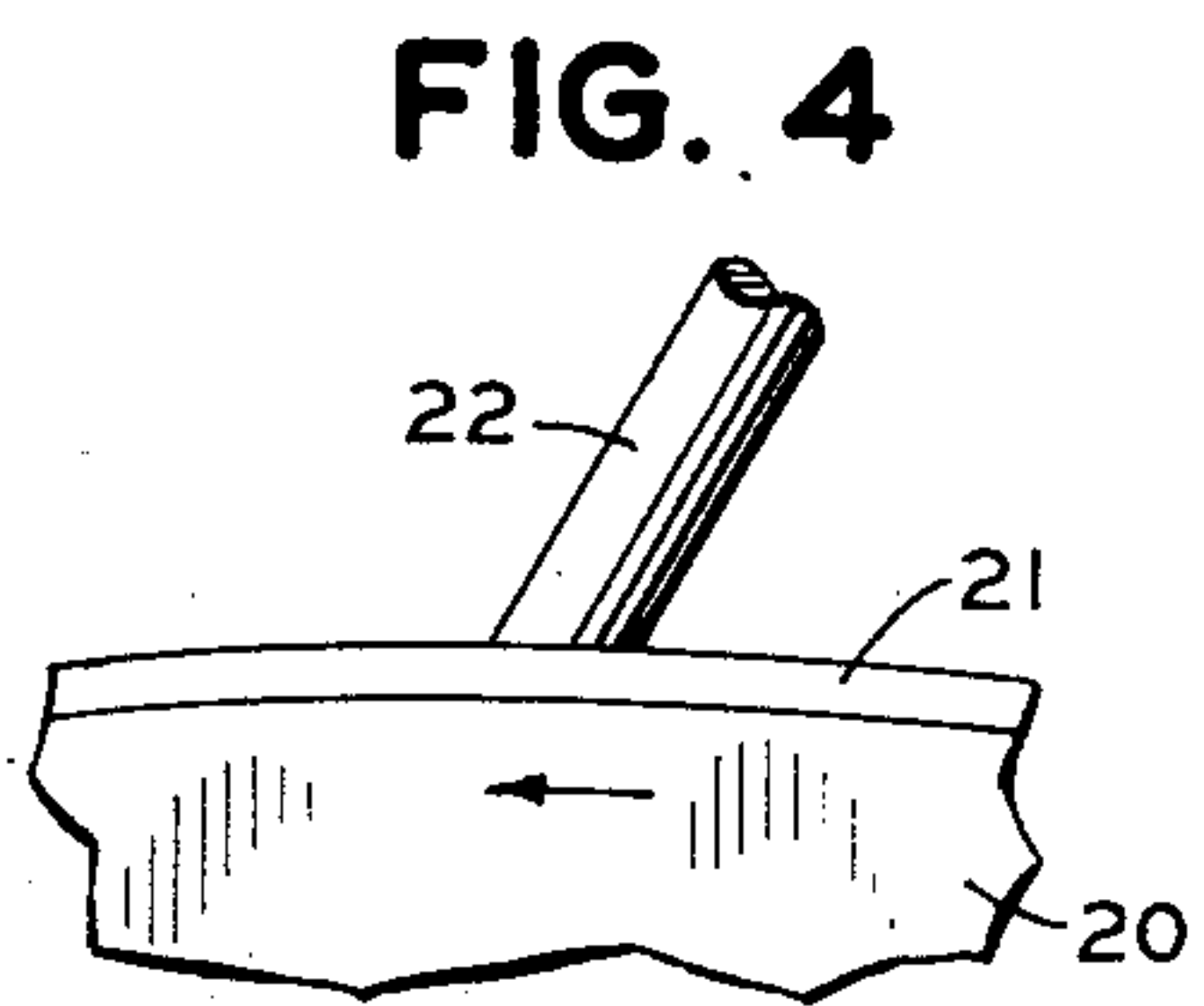
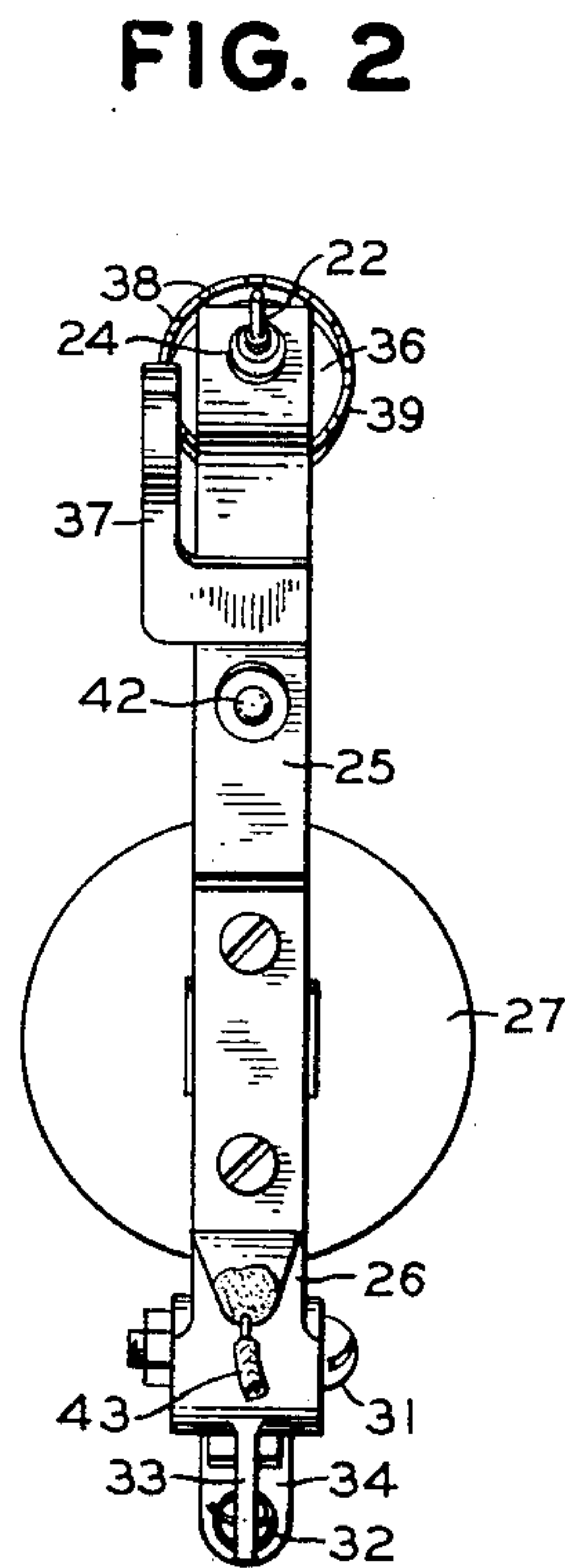
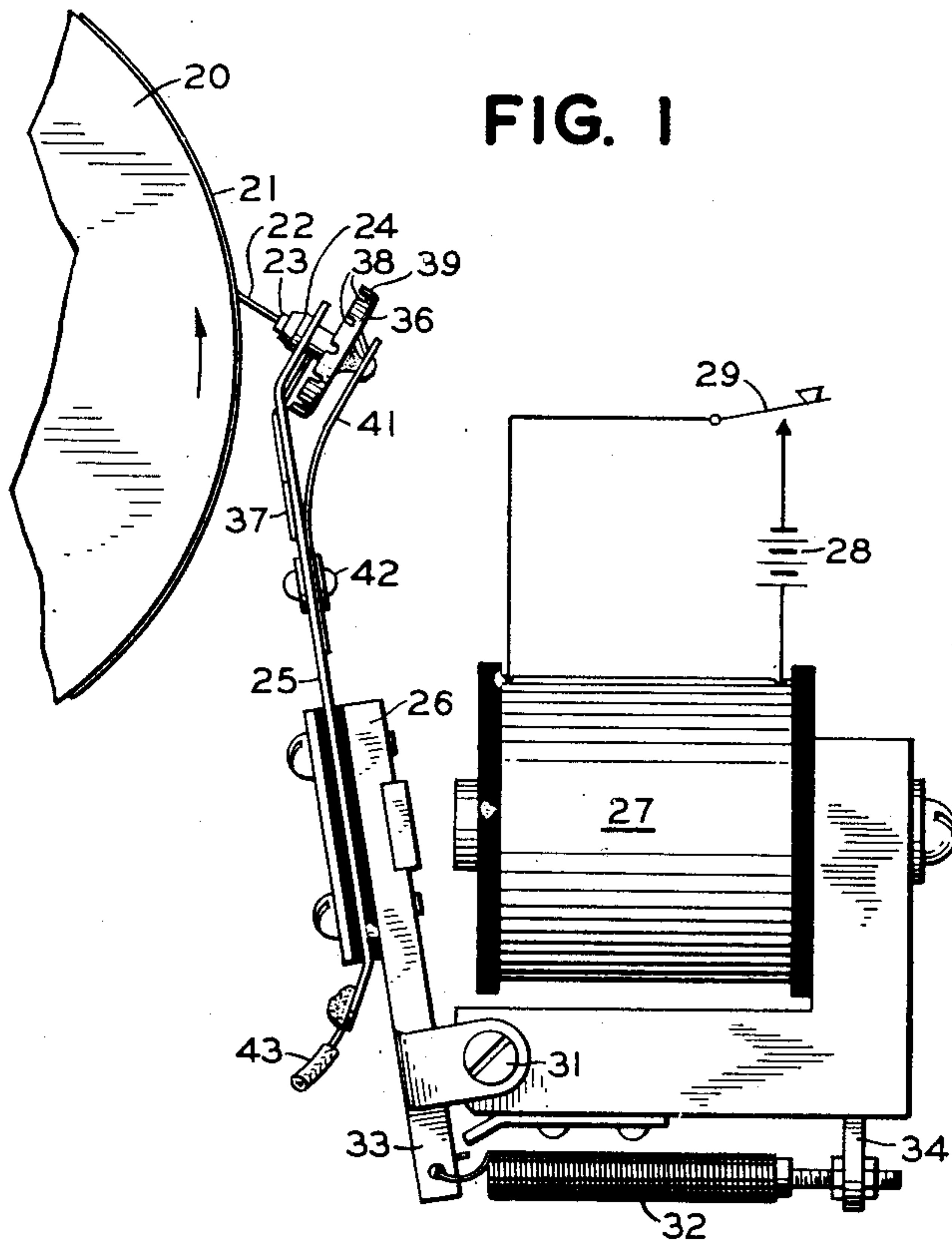
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ADJUSTABLE STYLUS FOR FACSIMILE RECORDERS

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## UNITED STATES PATENT OFFICE

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## ADJUSTABLE STYLUS FOR FACSIMILE RECORDERS

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9 Claims. (Cl. 178—13)

This invention relates to recording telegraph systems of the type employing an electrical recording stylus for applying electric current to a recording medium for producing a record thereon.

Systems of this type usually include a metallic supporting surface for a recording blank such, for example, as a recording cylinder around which a recording blank is wrapped, although other types of support for the recording blank can be used. The stylus is positioned in a suitable holder with an end held yieldingly in contact with the blank. Relative movement between the blank and stylus is obtained by various means to produce scanning of the blank by the stylus for recording purposes. Such movement is rapid and produces considerable friction so that the end of the stylus is gradually worn flat with the result that the recorded marking on the blank becomes blurred and loses the sharp definitions desired.

An object of this invention is to provide a stylus mechanism for a recording telegraph constructed and arranged to compensate for the flattening effect described by periodically presenting a fresh stylus bearing surface of relatively small area to the recording blank.

A further object is to provide a method of controlling the stylus in machines of the type set forth so as to provide sharp definition of the recorded subject matter throughout the life of the stylus.

A still further object is to provide an improved construction of stylus holder for a recording telegraph system or the like.

These and other objects which will be apparent to those skilled in the art are accomplished by the present invention, an embodiment of which is shown in the accompanying drawing, in which:

Fig. 1 is a side elevation of a stylus mechanism constructed in accordance with one embodiment of the invention and forming part of a recording telegraph having a metallic recording cylinder shown in part;

Fig. 2 is an elevation of the stylus mechanism looking from the left of Fig. 1;

Fig. 3 is a partial sectional view of an enlarged scale; and

Figs. 4 and 5 are partial elevations showing the flattening effect of the scanning operation and the manner in which the present invention overcomes such effect.

In the illustrated embodiment, the stylus holder is constructed to yieldingly press the stylus into engagement with the face of a suitable re-

5 cording medium such as recording paper capable of being marked by the passage of a recording electric current through the paper from the stylus. Such a recording paper is disclosed in the application of B. L. Kline, Serial No. 38,825, filed August 31, 1935.

As disclosed in our copending application, Serial No. 350,454, filed August 3, 1940, the best definition is obtained when the end of the stylus in contact with the recording paper assumes a crater-like formation, this crater producing a concentration of marking current at the central portion of the stylus so that the trace produced by the stylus is of considerably less width than the width of the stylus. The formation of this crater occurs rapidly when a new stylus is applied to the paper and current is passed there-through to the paper, providing the end of the stylus makes limited contact only with the paper so as to provide a point of high current density. As long as the marking current flows through the stylus to the paper the desired crater-like formation is retained, but during no current periods, as between the lines of a telegraph message, the frictional engagement of the stylus with the paper tends to wear the stylus flat. If the no current periods sufficiently predominate over the intervals of applied current, the stylus will eventually wear to the contour of the paper supporting drum. As this condition is approached, the current is distributed over a larger area of the stylus and the current density at no point is sufficient to cause the crater to reform. This difficulty is overcome in accordance with the present invention by slightly changing the angle of contact of the stylus and paper so as to again provide a sufficiently small area of contact of the stylus with the paper to permit reformation of the crater. This may be accomplished by changing the angle of the stylus to the paper so as to effect contact only between the toe or heel of the stylus end or by rotating the stylus so as to lift the major surface of the stylus from the paper. This latter method is preferred and means for conveniently making such an adjustment of the stylus point is shown in the accompanying drawing.

As illustrated, the invention is shown in connection with a rotary recording drum 20 having a sheet of recording paper 21 mounted on the surface thereof. A stylus 22 extends through a barrel 23 rotatably supported in a sleeve 24 secured to the upper end of a flexible current-conducting stylus-supporting arm 25, mounted on, but insulated from an armature 26 of a magnet



27 energized by current from any desired source 28 controlled by a suitable switch 29 or the like. It will be understood that in telegraph or facsimile recorders the magnet 27 will usually be automatically controlled for the purpose of positioning the stylus in operative or inoperative position. The armature is pivotally supported on a pin 31 and a spring 32 connects an extension 33 of the armature to a bracket arm 34 to normally yieldingly press the end of the stylus into engagement with the surface of the recording blank. When the magnet is energized the armature is moved against the tension of the spring to remove the stylus from engagement with the blank.

The end of the stylus opposite to the recording end projects beyond the barrel 23 and is bent so as to engage in an opening 35 formed in a thumb wheel 36 secured to the end of the barrel 23. This prevents relative rotation between the stylus and barrel and provides a simple means for rotating the stylus as hereafter described. A detent finger 37 secured to the arm 25 has its end positioned to engage in notches 38 formed in a peripheral flange 39 on the thumb wheel 36. A spring clip 41 is secured to the supporting arm 25 and extends upwardly to engage both the rear projecting end of the barrel 23 and the bent end of the stylus 22 to press the barrel into the supporting sleeve 24 until the thumb wheel 36, which is secured to the barrel by soldering, or any other means, engages the end of the sleeve. The clip 41 also holds the stylus in place without the necessity of soldering, so that the stylus can be easily removed by swinging the clip about its supporting rivet 42, and a new stylus quickly inserted in place.

The advantages resulting from the invention are shown in part in Figs. 4 and 5. Electric recording impulses are conveyed to the stylus over conductor 43 electrically connected to the conducting supporting arm 25. In the illustrated embodiment the drum and recording blank are rotated to produce the desired relative movement between the blank and the adjacent end of the stylus 22 which engages the blank surface. The resulting friction ultimately wears the end of the stylus flat, as shown in Fig. 4, with the result that the marking produced on the blank loses the desired sharp definition.

When this occurs it is only necessary, with the present construction, to rotate the thumb wheel 36 a fraction of a revolution. This rotates the stylus on its own axis, as shown in Fig. 5, with the result that a fresh bearing surface of relatively small area formed by the edge of the flattened face is brought into contact with the recording blank with the result that sharp definition of the marking produced on the blank is restored.

This operation may be continued until substantially the entire projecting end of the stylus has been used up. Waste resulting from clipping the stylus to sharpen it is eliminated, and when needed a new stylus can be quickly and easily substituted in the manner above described.

It will be understood that many modifications and changes can be made in the structure shown without departing from the essential attributes of the invention, and we contemplate all such changes as coming within the scope of the appended claims.

What is claimed is:

1. The combination in a telegraph or mechanism for marking a recording medium including

a recording stylus adapted to apply electric current to said medium for producing a record thereon, means for holding said stylus in contact with said medium for relative movement across the surface thereof, and means for adjustably mounting said last mentioned means for changing the position of said stylus relative to said medium to compensate for the flattening effect of such movement on said stylus and to present a fresh bearing surface of relatively small area to said medium.

2. The combination in a telegraph or mechanism for marking a recording medium including a recording stylus adapted to apply electric current to said medium for producing a record thereon, means for holding said stylus in contact with said medium for relative movement across the surface thereof, and means for rotatably mounting said stylus holding means to change the position of said stylus relative to said medium to compensate for the flattening effect of such movement on said stylus and to present a fresh bearing surface of relatively small area to said medium.

3. The combination in a telegraph or mechanism for marking a recording medium including a recording stylus adapted to apply electric current to said medium for producing a record thereon, means for holding said stylus in contact with said medium for relative movement across the surface thereof, and means for mounting said stylus-holding means, said last means being adapted to be positioned and held in a plurality of different positions for changing the angle of the surface in contact with the recording medium, relative to the said medium to decrease the area of contact of the stylus and said medium.

4. The combination in a recording telegraph for marking a recording medium of a support for a recording stylus including a barrel, a stylus extending through said barrel with one end thereof in position for relative movement across the surface of said medium to apply electric current thereto for producing a record thereon, means for preventing relative rotation between said stylus and barrel, a support for said barrel, and means for rotatably mounting said barrel in said support to permit rotation of said barrel to present a fresh stylus bearing surface of relatively small area to said medium.

5. The combination in a recording telegraph for marking a recording medium of a support for a recording stylus including a barrel, a stylus extending through said barrel with one end thereof in position for relative movement across the surface of said medium to apply electric current thereto for producing a record thereon, means for preventing relative rotation between said stylus and barrel, a support for said barrel, means for rotatably mounting said barrel in said support to enable a fresh stylus bearing surface of relatively small area to be presented to said medium, and means for yieldingly resisting rotation of said barrel.

6. The combination in a recording telegraph for marking a recording medium of a holder for a recording stylus including a barrel, a stylus extending through said barrel with one end thereof in position for relative movement across the surface of said medium to apply electric current thereto for producing a record thereon, a support for said barrel, means for rotatably mounting said barrel in said support including a thumb wheel mounted on said barrel, and means connecting the other end of said stylus to said wheel



to prevent relative rotation between said stylus and barrel.

7. The combination in a recording telegraph for marking a recording medium of a holder for a recording stylus including a barrel, a stylus extending through said barrel with one end thereof in position for relative movement across the surface of said medium to apply electric current thereto for producing a record thereon, a support for said barrel, means for rotating said barrel in said support including a thumb wheel mounted on said barrel, means connecting the other end of said stylus to said wheel to prevent relative rotation between said stylus and barrel, and means for yieldingly holding said barrel in said support and said stylus in said barrel.

8. The combination in a recording telegraph for marking a recording medium of a holder for a recording stylus including a barrel, a stylus extending through said barrel with one end thereof projecting therefrom in position for relative movement across the surface of said medium to apply electric current thereto for producing a

5 record thereon, a supporting arm, means for rotatably supporting said barrel in said arm to be presented a fresh stylus bearing surface of relatively small area to said medium including a thumb wheel mounted on said barrel and having a notched edge, and a detent engaging said edge to yieldingly resist rotation of said barrel and stylus.

9. The combination in a recording telegraph for marking a recording medium of a holder for a recording stylus including a barrel, a thumb wheel mounted on said barrel, a stylus extending through said barrel with one end thereof in position for relative movement across the surface of said medium to apply electric current thereto for producing a record thereon and the other end bent into engagement with said wheel to prevent relative rotation between said stylus and barrel, and a spring member engaging the ends of said stylus and barrel for holding them in position in said holder.

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