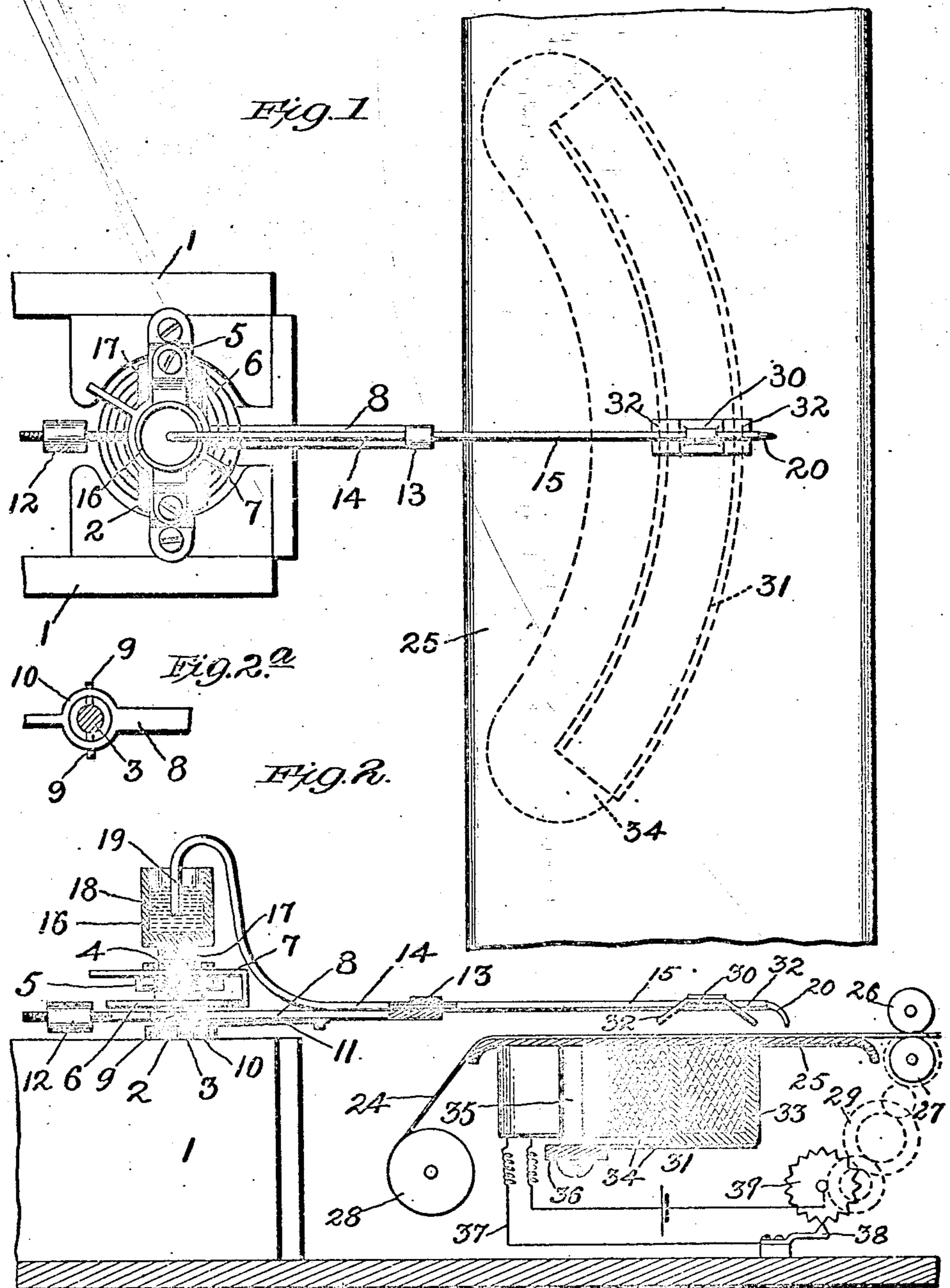


J. HARRIS.
RECORDING INSTRUMENT.
APPLICATION FILED JUNE 14, 1907.

899,043.

Patented Sept. 22, 1908.

2 SHEETS—SHEET 1.



Witnesses
Geo. A. Byrne.
W. J. Chornborn

Inventor
Jesse Harris
By John H. Wolf
Attorney

J. HARRIS.
RECORDING INSTRUMENT.
APPLICATION FILED JUNE 14, 1907.

899,043.

Patented Sept. 22, 1908.

2 SHEETS—SHEET 2.

Fig. 3.

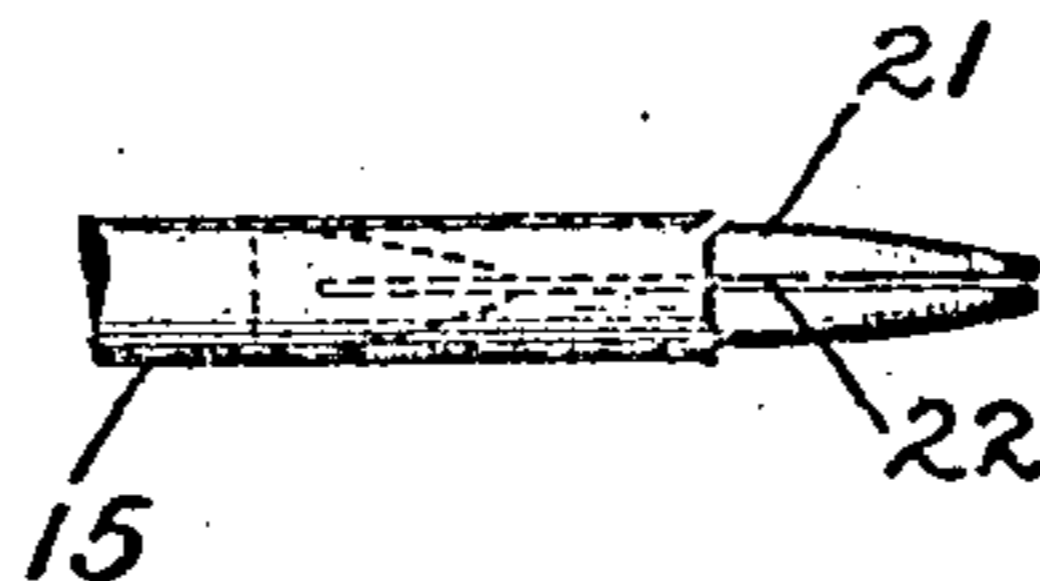


Fig. 4.

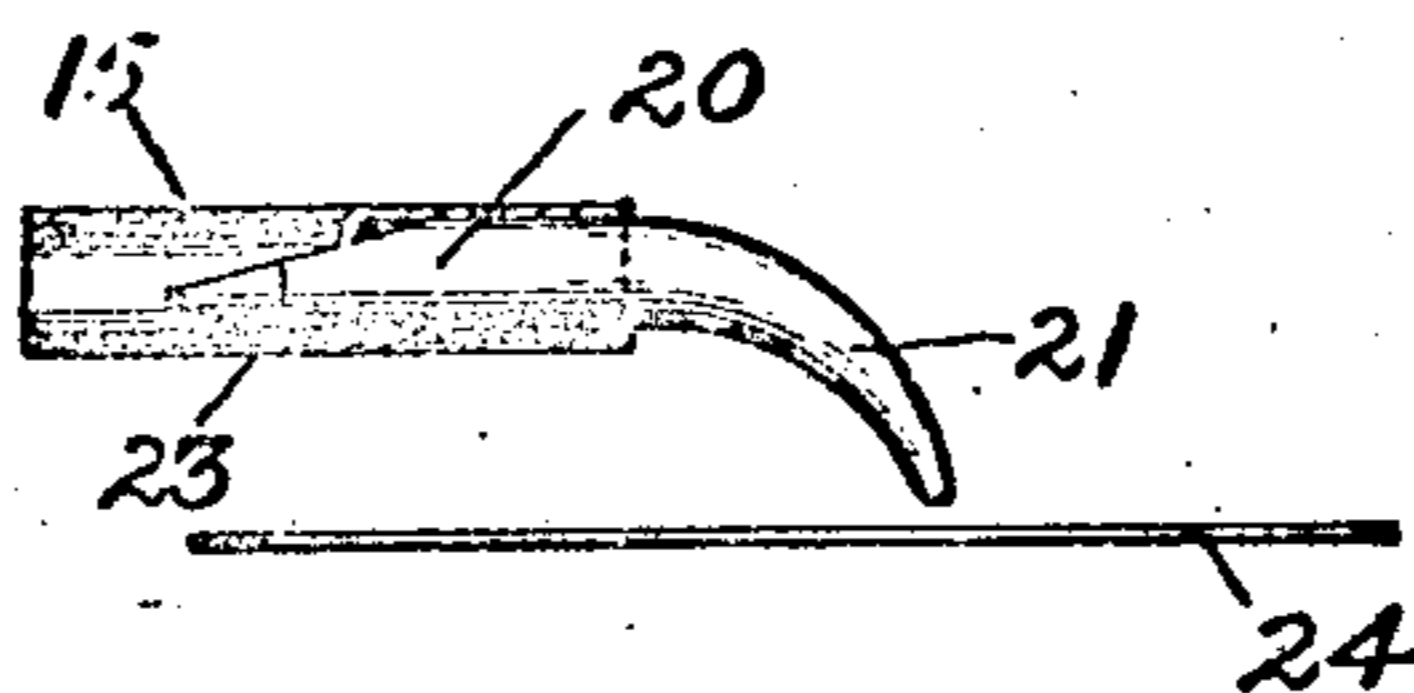


Fig. 5.

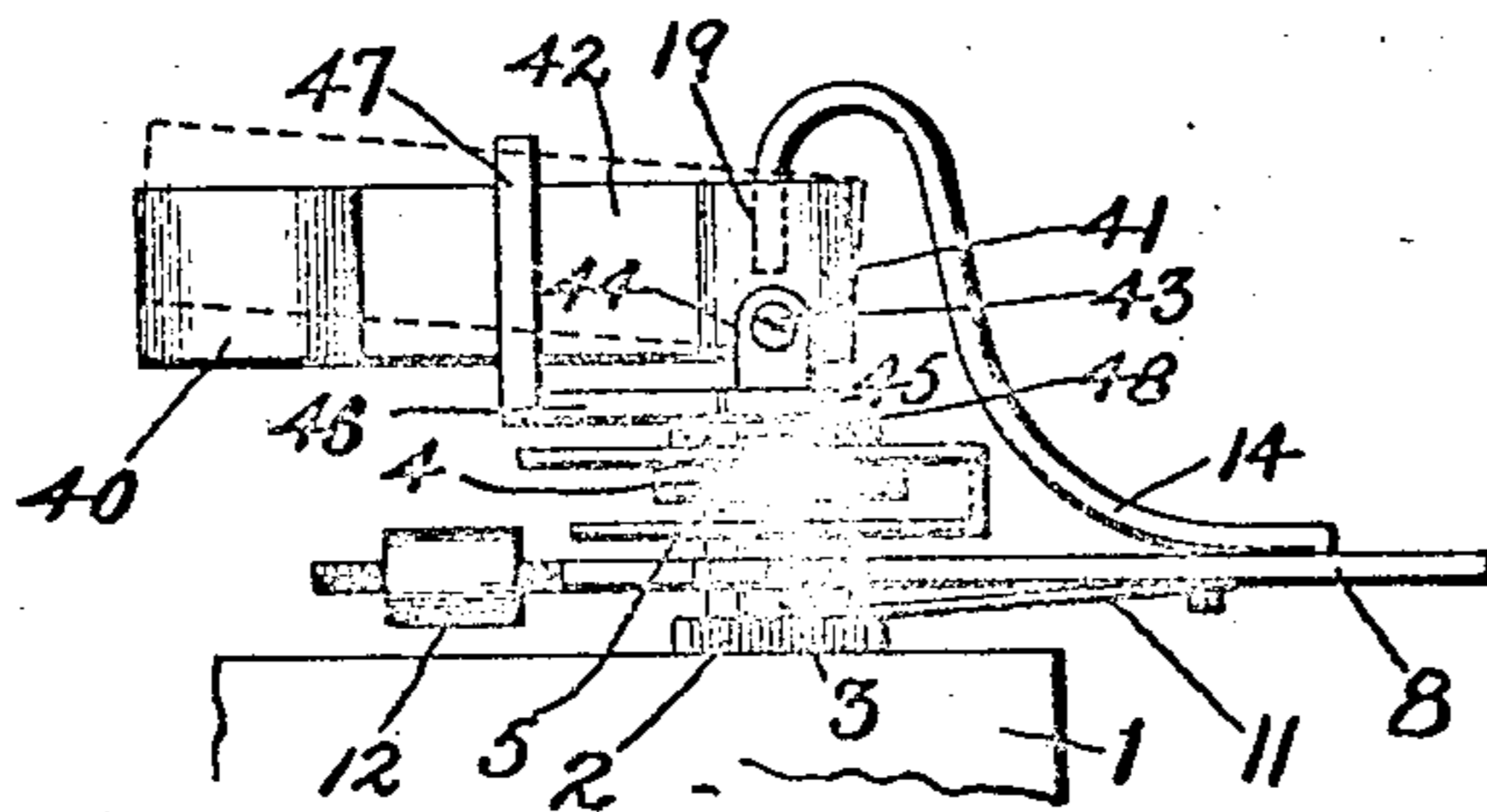


Fig. 6.

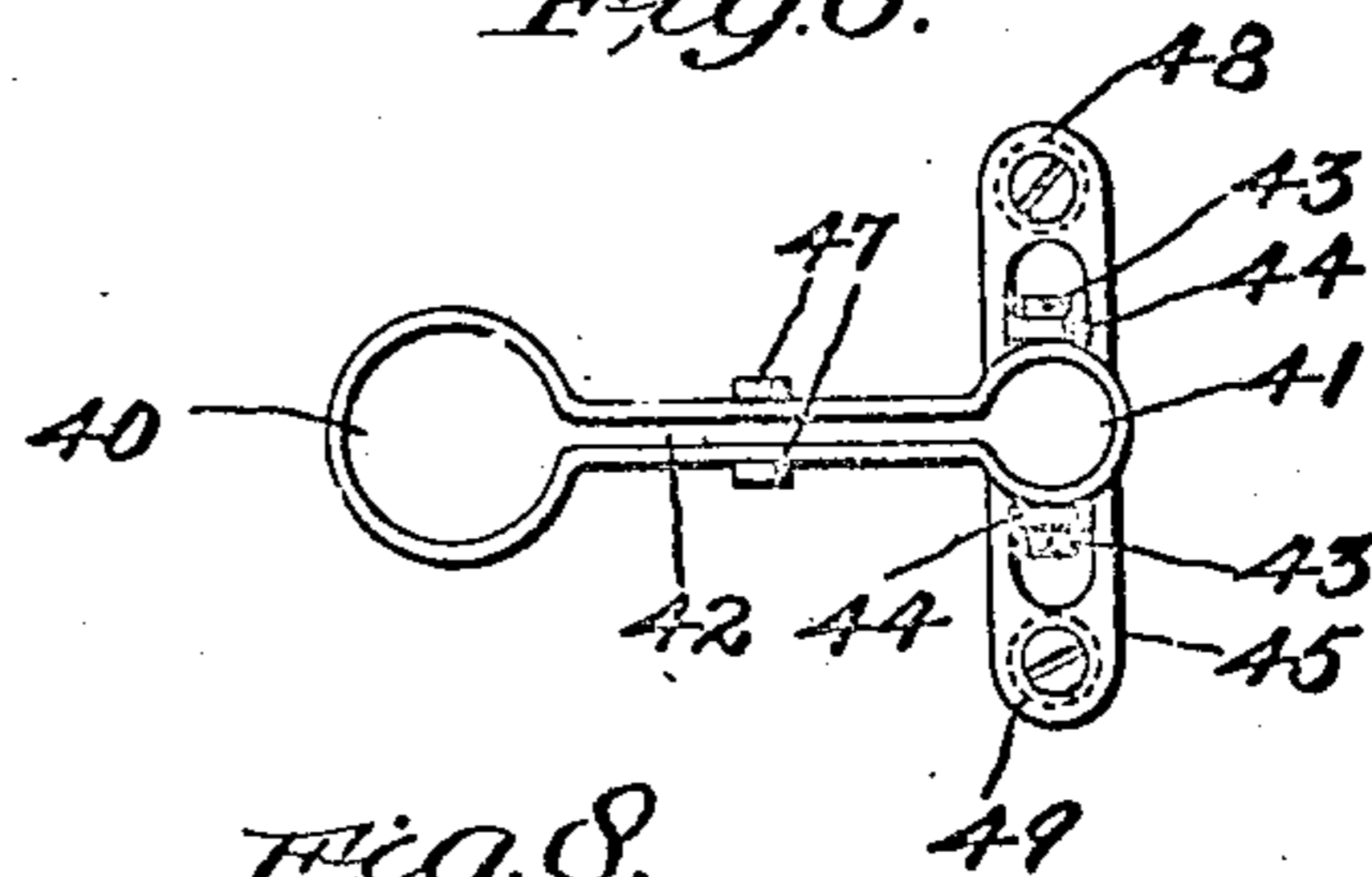


Fig. 8.

Fig. 7.

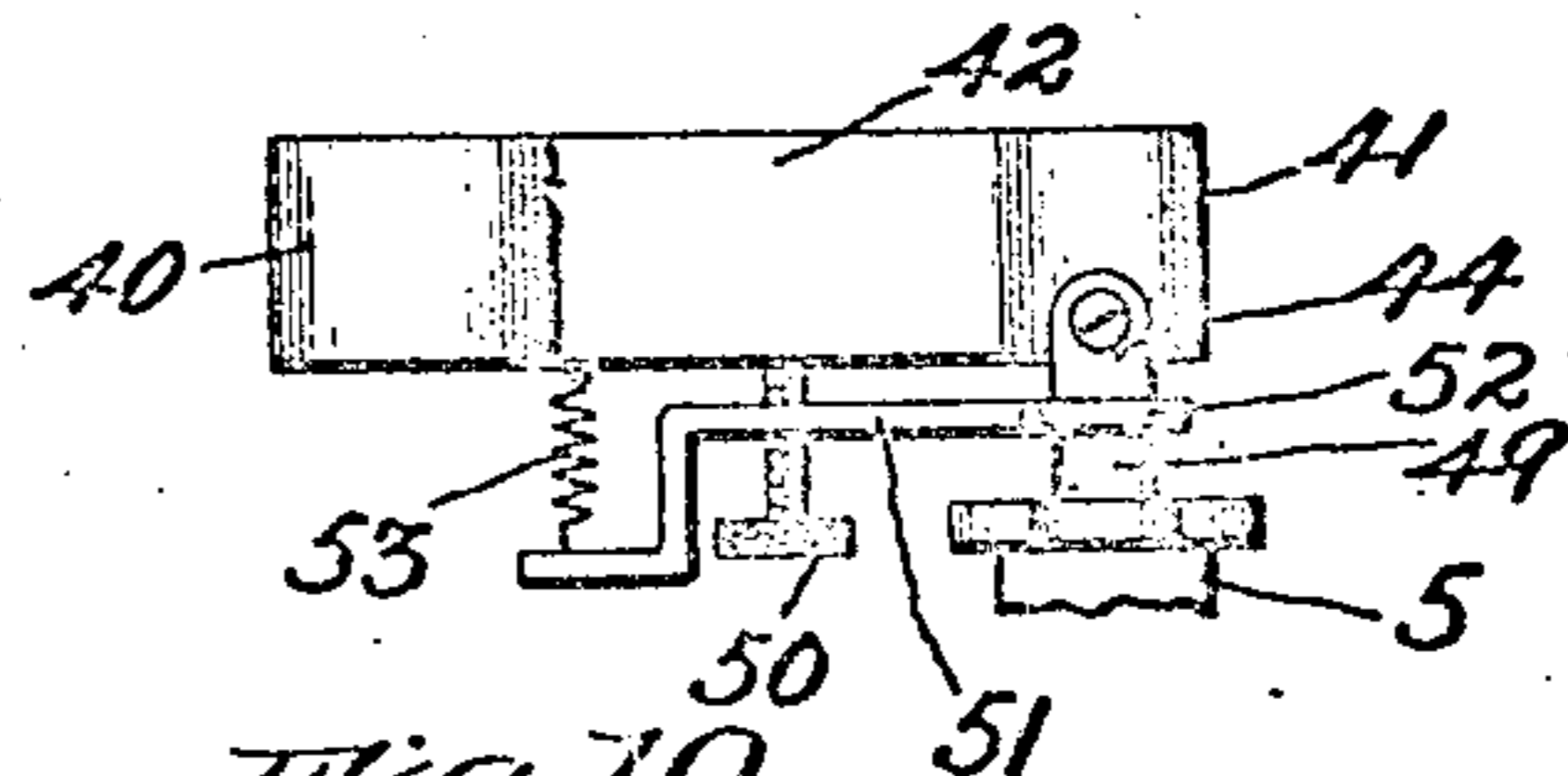
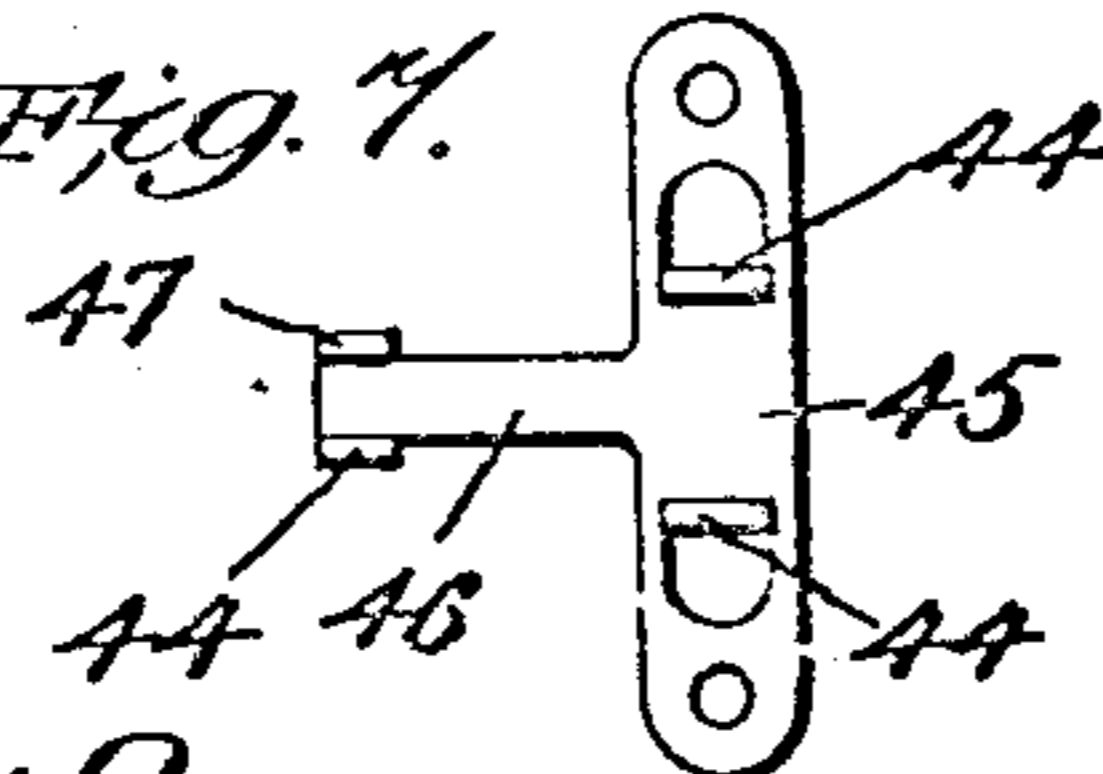


Fig. 9.

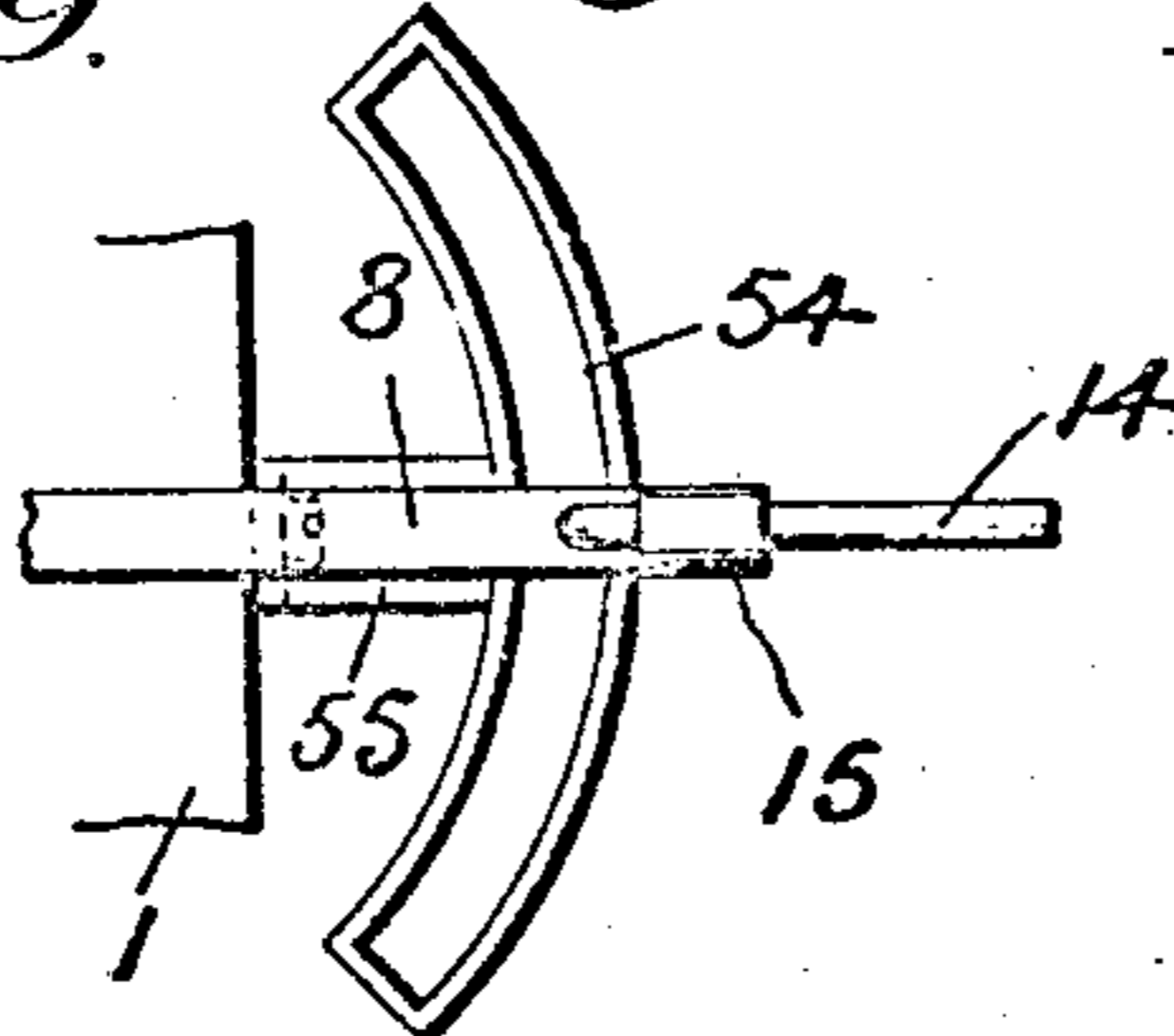
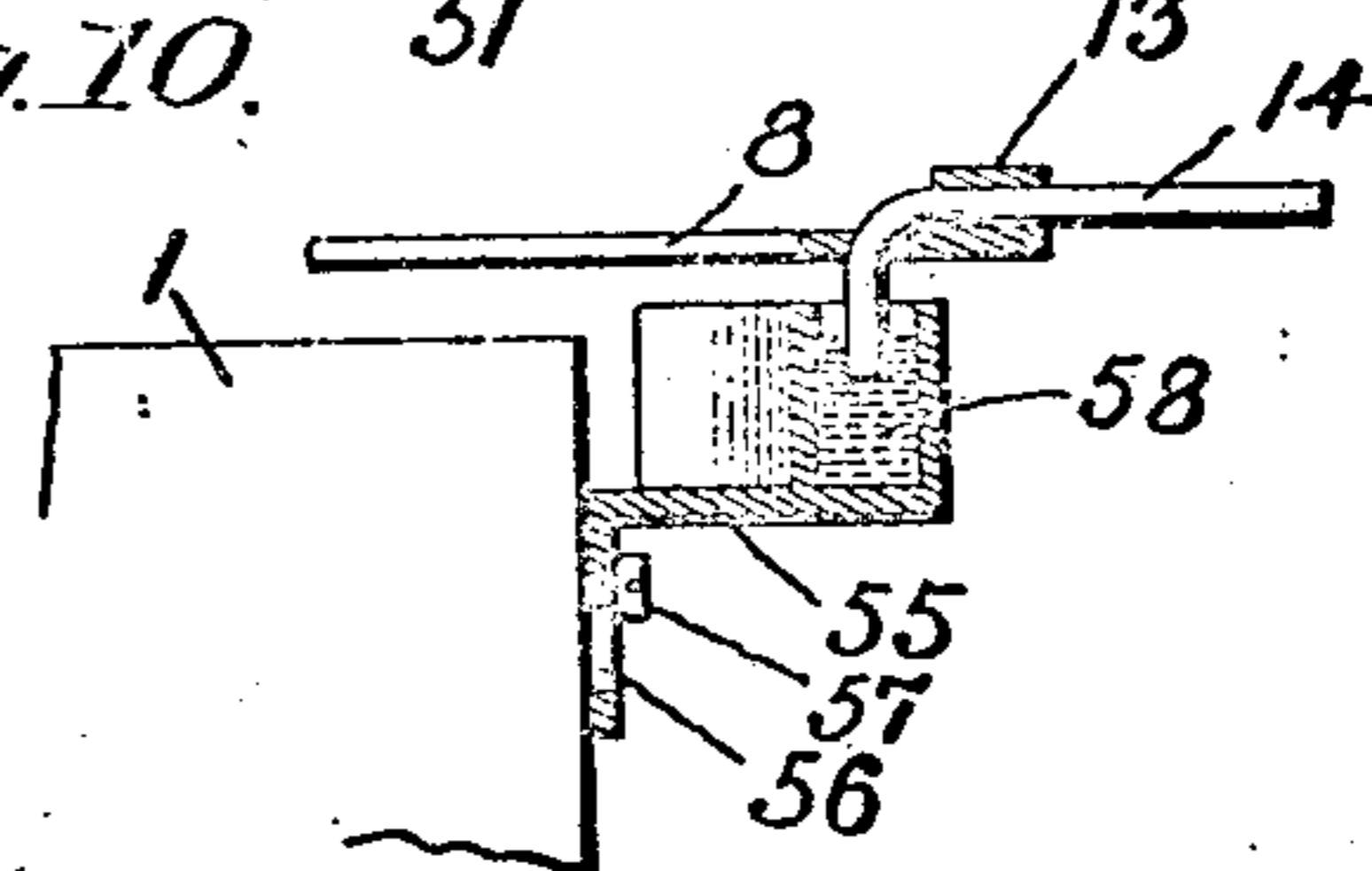


Fig. 10.



Witnesses

Geo. A. Repue.
W. E. Schaubert.

Inventor

Jesse Harris
By John S. Volk
his Attorney

UNITED STATES PATENT OFFICE.

JESSE HARRIS, OF LA FAYETTE, INDIANA, ASSIGNOR TO CENTRAL LABORATORY SUPPLY COMPANY, OF LA FAYETTE, INDIANA, A CORPORATION OF INDIANA.

RECORDING INSTRUMENT.

No. 899,043.

Specification of Letters Patent.

Patented Sept. 22, 1908.

Application filed June 14, 1907. Serial No. 378,954.

To all whom it may concern:

Be it known that I, JESSE HARRIS, a citizen of the United States, residing at La Fayette, in the county of Tippecanoe and State of Indiana, have invented certain new and useful Improvements in Recording Instruments, of which the following is a specification.

The present invention is directed more especially to those parts of recording measuring instruments which have to do with the marking device proper, by which the record is made upon the record-receiving surface, and to the means for holding and supplying the recording fluid to the said marking device.

The said invention consists further in the structural details hereinafter described and more particularly pointed out in the accompanying claims.

In order to more particularly describe my said invention, reference will be had to the accompanying drawings, wherein:—

Figure 1, represents in top plan, a specific embodiment of my invention and related parts of the recording instrument; Fig. 2, a central vertical section of the same partly in elevation; Fig. 2^a, a detail plan view, partly in section, showing the manner of pivoting the pointer; Fig. 3, a detail top plan view of the recording pen and a part of the tube for supplying fluid thereto; Fig. 4, a vertical central section through the portion of the tube shown in Fig. 3, showing the said pen in side elevation; Fig. 5, a side elevation showing a modified form of ink reservoir embodying my invention; Fig. 6, a top plan view of the same; Fig. 7, a top plan view of the bracket for supporting said ink receptacle; Fig. 8, a side elevation showing an alternative arrangement for adjusting the ink receptacle shown in Figs. 5 and 6; Fig. 9, a fragmentary top plan view showing a form of ink reservoir located beneath the pointer; and Fig. 10, a vertical central section of said reservoir with related parts in elevation.

Referring to the accompanying drawings, 1, represents the magnet; 2, the moving coil; 3, the pivot spindle of said coil; 4, one of the pivot bearing screws for said spindle; 5, the supporting bracket for said screw; and 6, one of the torsional hair springs attached to adjusting arm 7, of an electrical measuring instrument such for example as the well known Weston voltmeter or ammeter.

My invention consists in providing such an instrument or any other form of measur-

ing instrument to which the same may be applied, with certain recording mechanism which consists, among other parts, in the specific form of the invention shown, of a pointer comprising an arm 8, mounted by pivots 9 on the spindle 3, the said arm being provided with a ring or collar portion 10 which carries the pivots 9 and through which extends the spindle 3. The mounting of the arm 8 permits angular movement thereof in two directions; radially of the axis of spindle 3 and in a direction at right angles thereto. One extension of the arm 8 is provided with a spring 11 made fast thereto and resting on the frame of the coil 2, the said spring acting in opposition to the downward movement of that end of the arm. The other extension of the arm is provided with an adjustable counter-balance 12. Secured to this arm 8 in any suitable manner, as by passing through a collar 13 at one end of said arm, and fitting the said collar tightly, is an elongated tube 14, of metal, hard rubber or other suitable material. This tube, in the case shown, forms a stiff or rigid extension 15, beyond one end of the arm 8, while the portion of the tube extending in the opposite direction is arranged to dip into a reservoir carrying ink or other suitable recording fluid. In the form of the invention shown in Figs. 1 and 2 this reservoir consists of a receptacle 16, made fast in any suitable manner to a bracket 17 mounted fast on the bracket 5 in such manner as not to interfere with the pivot screw 4 or the adjusting arm 7 of the moving coil system. The tube 14 is arranged to dip into the fluid 18 within said receptacle without engaging the said receptacle, and in such manner that the longitudinal axis of the portion 19 of said tube thus dipping into said fluid will coincide substantially with a continuation of the axis of the moving system, or, in other words, the axis about which the said tube is mounted for angular movement radially. By this arrangement the radial angular movement of the tube 14 caused by the rotation of the moving system becomes substantially zero at that portion which passes into the recording fluid. The recording fluid therefore has no effect on the movement of the pointer, which is a decided advantage.

The tube 14 conducts the recording fluid by siphoning from the receptacle 16 to the pen proper which, in one form, consists of a

plug 20 inserted in the free end of the tube extension 15, and provided with a curved recording point 21. The plug 20 is divided centrally throughout almost its entire length by a slit 22, and cut away as at 22 for the entrance of the recording fluid into said slit. The recording fluid entering the slit 22 will be fed to the point of said pen by capillary action.

In Figs. 1 and 2, I have shown my invention applied to that type of instrument such for example as shown and described in U. S. Patents Nos. 807,518 and 848,329, granted to C. E. Vawter, Jr., in which the pen or recording point is movable laterally by a pointer near the surface of, though normally out of engagement with, a record-receiving strip or sheet which is made to pass by suitable mechanism over a supporting plate, and in which the pen is periodically drawn into engagement with the record-receiving strip or sheet by the action of a magnet which periodically attracts an armature attached to the pointer.

In the accompanying drawings, 24, represents the record-receiving strip or sheet; 25, the supporting plate therefor; 26 and 27, feed rollers acting to cause said record-strip or sheet to pass from a roll 28 over said plate; 29, clock or other suitable mechanism for actuating said rollers; 30, the armature secured to the pointer; and 31, the magnet for actuating the pen through the medium of said armature. In the case illustrated, this armature consists of a small piece of iron adapted to slip over one end of the tube extension 15 and made fast thereto, the said armature having downward extensions 32 adapted to pass over the poles of said magnet.

The specific form of magnet shown consists of a core 33, of iron forming a trough extending lengthwise in the arc of a circle, and U-shaped in cross section, in which trough is laid the exciting coil 34. This coil extends between the sides of the trough and alongside and close to the outside of one of said sides, as shown. The magnet may be supported in any suitable manner, such for example, as being screwed to studs 35 on the bottom of the plate 25, one of said studs only being shown, and held between said plate and a cross piece 36. The exciting circuit 37 of said magnet may be interrupted at suitable intervals by any desired circuit-interrupting means, a form of such means being indicated in the drawing by the spring contact 38 and notched wheel 39, connected in circuit 37, and the said wheel 39 operated by the mechanism 29. The circuit 37 is alternately completed and interrupted by the points of the teeth of the wheel 39 passing successively into and out of engagement with the contact 38 as the said wheel rotates.

In Figs. 5 to 7, inclusive, I have shown a

modified form of the ink reservoir and means for supporting the same. In this case the reservoir is made of such shape as to form two chambers 40 and 41 which connect through an elongated passage 42, the sides of the chamber 41 being held between two pivots 43 mounted in uprights 44 on a supporting bracket 45 which has an extension 46 provided with upwardly extending arms 47, adapted to engage the sides of the reservoir as shown. The bracket 45 is supported upon studs or uprights 48, 49 mounted on bracket 5 on opposite sides of the bearing screw 4. By mounting the ink reservoir in this manner it may be tilted up or down on its pivots, as shown in dotted lines in Fig. 5, and held in the desired position by the friction of the arms 47. By thus varying the elevation of chamber 40 the flow of the ink to the pen may be regulated. The tilting of the reservoir may be effected by means of an adjusting screw 50 mounted in an arm 51 taking the place of arm 46 and forming an extension on a bracket 52 otherwise similar to the bracket 45, the reservoir being held down upon said screw by a small spring 53. Also, instead of mounting the reservoir above the level of the pen and siphoning the ink to the pen, I may locate the reservoir below the level of the pen and feed the ink to the pen through the tube by capillary action. In Figs. 9 and 10 I have shown one way in which this may be done, where 54 represents the ink reservoir which, in the case shown, is in the form of an arc shaped trough provided with a supporting bracket 55 having a slot 56 therein through which passes an attaching screw 57 by which the said reservoir may be adjustably secured to the magnet 1. The tube 14, in this case, dips down into the ink or other recording fluid in the reservoir and takes the said liquid up by capillary action to the pen. By means of the slot and screw connection shown, or other suitable means the reservoir may be raised or lowered and thus adjusted to keep the ink substantially at the same level without adding fresh ink.

Having thus described my invention, what I claim is:—

1. A recording measuring instrument, comprising a system mounted for angular movement on an axis, an arm pivoted on said axis, angularly movable by said system laterally and movable upon said pivot in a direction substantially at right angles to said lateral movement, a reservoir for recording fluid, a tube secured to said arm and adapted to dip at one end into said reservoir out of contact therewith and movable by said arm in said reservoir, on an axis coinciding substantially with the axis of said system, said tube adapted to form at its other end a rigid extension to said arm, a pen attached to said tube to receive recording fluid therefrom, an

armature attached to said extension, and a magnet in operative relation to said armature.

2. A recording instrument, comprising a reservoir for recording fluid, a pointer mounted for angular movement radially about a given axis, said pointer comprising a pen located at its end distant from said axis, and a tube connected to said pen to feed fluid thereto from said reservoir, said tube dipping into said reservoir in line with said axis and rotatable therein longitudinally about a continuation of said axis, the relative lateral motion between said tube and the fluid in said reservoir thereby becoming substantially zero.

3. A recording instrument, comprising a reservoir for the recording fluid, adjustably mounted to vary the feed of said fluid, a pointer mounted for angular movement radially about a given axis, said pointer comprising a pen located at its end distant from said axis, and a tube connected to said pen to feed fluid thereto, from said reservoir, said tube dipping into said reservoir in line with said axis and rotatable therein longitudinally about a continuation of said axis, the relative lateral motion between said tube and the fluid in said reservoir thereby becoming substantially zero.

4. A recording instrument, comprising the moving system of a measuring instrument, a reservoir for recording fluid, a pointer mount-

ed for angular movement radially about a given axis by said system, said pointer comprising a pivoted arm, a tube carried by said arm and dipping into said reservoir in line with said axis and rotatable therein longitudinally about a continuation of said axis, the relative lateral motion between said tube and the fluid in said reservoir thereby becoming substantially zero, and a pen connected to the end of said tube distant from said reservoir.

5. A recording instrument, comprising a moving system, a recording fluid containing reservoir, recording means movable by said system and comprising a recording point and fluid conducting means movable therewith relatively to said reservoir and adapted to convey fluid from said reservoir to said point, the said reservoir being supported independently of said recording means, and the said fluid conducting means dipping into the fluid in said reservoir substantially in line with the axis of the moving system so that the lateral movement of said fluid conducting means due to the movement of said system is zero within said fluid.

In testimony whereof I affix my signature in presence of two witnesses.

JESSE HARRIS.

Witnesses:

JAS. B. GREEN,
CHARLES W. MEGGENHOFEN.