A. L. GOLDEN.

TELAUTOGRAPH INSTRUMENT.

APPLICATION FILED DEC. 15, 1908.

957,050.

Patented May 3, 1910.

2 SHEETS—SHEET 1.

Fig. 1.

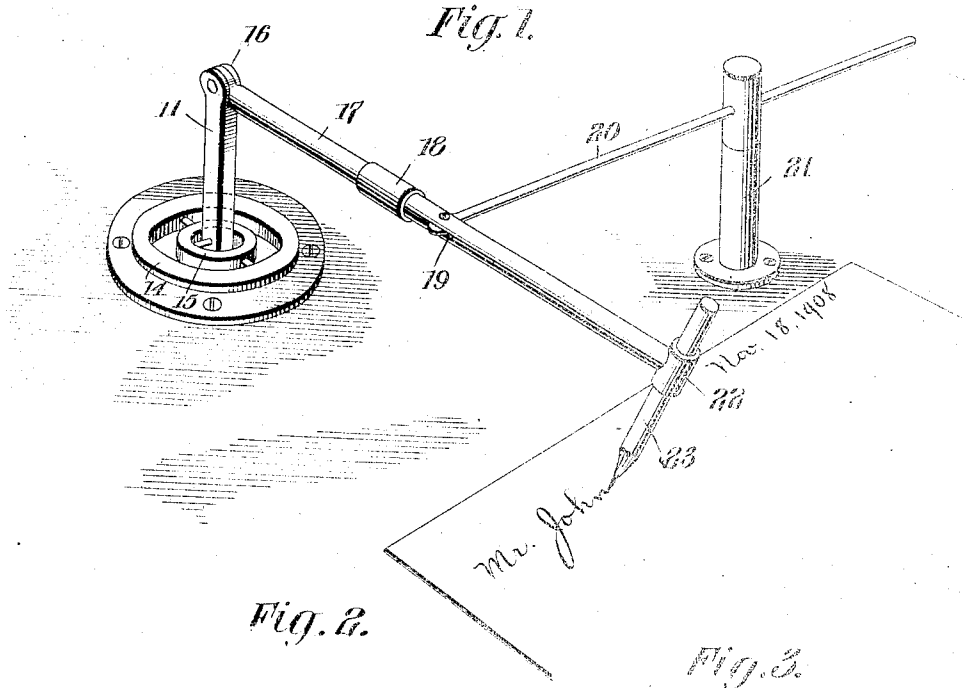


Fig. 2.

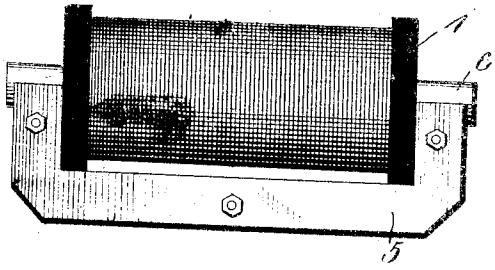


Fig. 3.

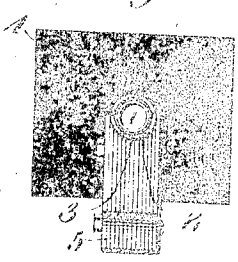


Fig. 4.

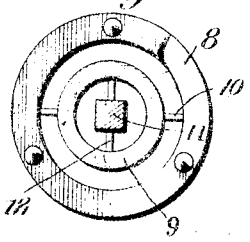
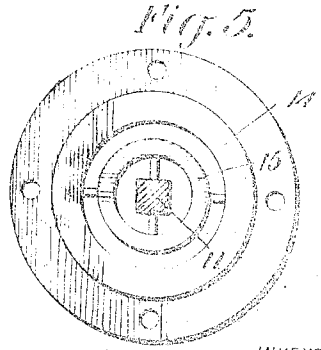


Fig. 5.



WITNESSES

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2 SHEETS—SHEET 2.

Fig. 6.

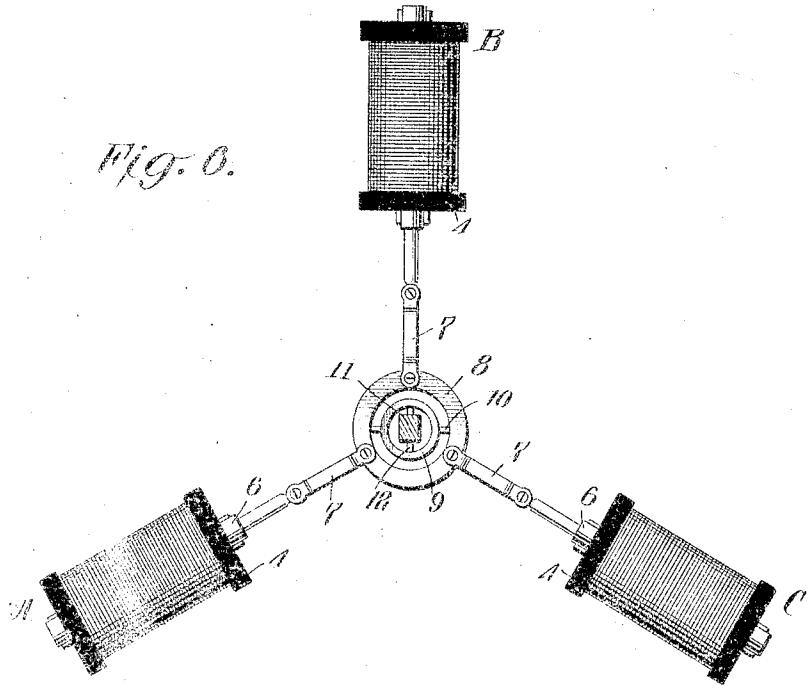


Fig. 7.

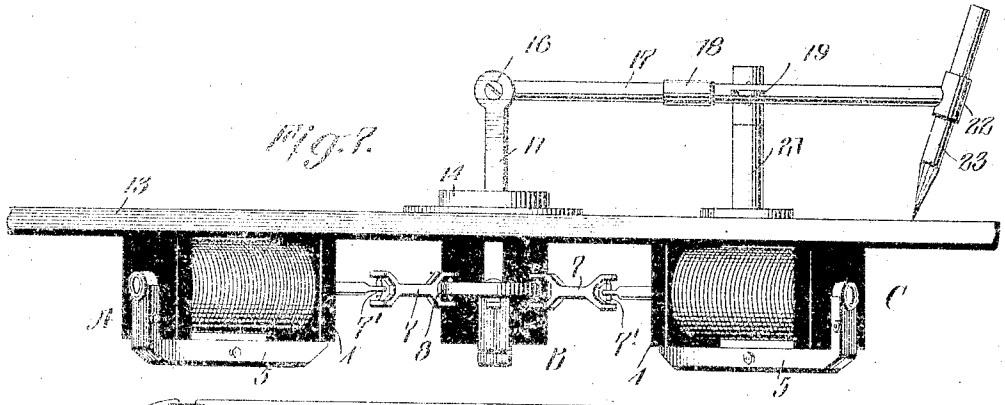
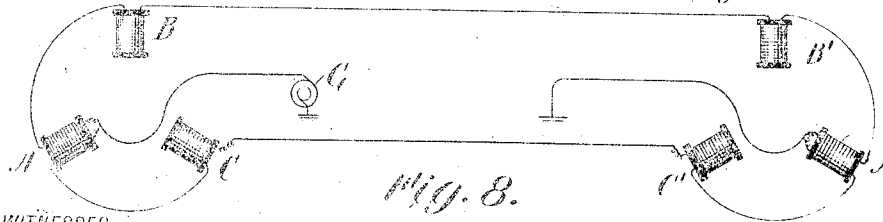


Fig. 8.



WITNESSES

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TELAUTOGRAPH INSTRUMENT.

957,950. Specification of Letters Patent. Patented May 3, 1910.

Application filed December 15, 1906. Serial No. 467,614.

To all whom it may concern:

Be it known that I, ALPHONSUS L. GOLDEN, a citizen of the United States, and a resident of Oakland, in the county of Alameda and State of California, have made certain new and useful Improvements in Telautograph Instruments, of which the following is a specification.

My invention relates to improvements in instruments for copying written matter or drawings by electro-magnetic means, and it consists in the constructions, combinations and arrangements hereinafter described and claimed.

An object of my invention is to provide a device by means of which a person at one station may write a letter, sign his name or execute a drawing, which a similar device will reproduce at another station in the form of an exact duplicate.

A further object of my invention is to provide an improved means for accomplishing the above result, in which a series of magnets coact to effect the movement of a pencil or stylus in response to variations in an electric circuit.

Other objects and advantages will appear in the following specification and the novel features of the invention will be particularly pointed out in the appended claims.

My invention is illustrated in the accompanying drawings, in which—

Figure 1 is a perspective view of the pencil holding mechanism. Fig. 2 is a side view of one of the magnets. Fig. 3 is an end view. Fig. 4 is a plan view of the universal joint between the magnet cores. Fig. 5 is a plan view of a universal bearing for the pencil stem. Fig. 6 is a plan view of the three magnets. Fig. 7 is a view showing the relation of the magnets and the pencil holder, and Fig. 8 is a diagrammatic sketch showing the operative circuits.

Referring now to Figs. 2 and 3 I have shown therein the solenoid magnets used in connection with the invention. They comprise a glass tube 1 around which is a layer of annealed steel wire laid lengthwise over the outer surface of the tube and covered with an insulating wrapping 3. A hard rubber plate 4 is arranged at each end of the tube. A return bar 5 is provided, which consists of a series of annealed steel plates cut out in the form shown and bolted together as shown in Figs. 2 and 3.

The core 6 consists of a bundle of fine annealed steel wires inside of a hard rubber casing. A metal lug is attached to one end. The core 6 is constructed so that it will slide freely but not loosely inside of the solenoid.

The arrangement of the magnets is shown in Figs. 6, 7 and 8. The cores of the magnets point to a common center, the angle between the cores in the normal or central position being 60°. The cores of the magnets are connected by means of the links 7 to a universal joint. The links 7 are pivoted at each end by the pivot pins 7′ as shown in Fig. 7. The universal joint consists of the outer ring 8 having an inner concentric ring 9 pivoted for rotation on the pins 10. The lever 11 is pivoted within the ring 9 on the pins 12 at right angles to the direction of the pins 10. With the construction just described it is apparent that the lever 11 may have a movement in any direction except that of rotation around its own axis, or in the longitudinal direction of its axis.

As shown in Figs. 1 and 7 the lever 11 projects up through an opening in the table 13, being pivotally suspended in said opening by means of the universal joint shown in Fig. 5. This joint is somewhat similar to that already described, in that it has an outer ring 14, an inner concentric ring 15, the lever 11 being pivoted within the ring 15.

From Fig. 7 it will be seen that the magnets A, B, C, are secured to the under side of the table 13 through which the lever 11 projects. The upper end of the lever is pivotally connected at 16 to a laterally extending arm 17 which is provided with a swivel joint 18 and is slotted at 19 to receive the end of a rod 20, to which it is pivotally connected. The rod 20 extends through an opening in a swivel post 21, which is secured to the top of the table and is adapted to slide back and forth through said opening as the rod 17 is moved. The end 22 of the rod 17 constitutes the holder for the pencil 23.

The circuits by which the device is operated are shown in Fig. 8. In this figure G denotes an alternating current generator. The coil A has a split winding, each half having the same number of ampere turns and the two halves together equaling the winding on each of the other two magnets B and C. Another station is shown equipped with a similar set of magnets A′, B′, C′, the terminals of the windings of the magnet A′ being grounded.

From the foregoing description of the various parts of the device the operation thereof will be readily understood. When a message, signature or drawing is to be sent, a sheet of paper is placed underneath the pencil at the sending station. The person sending them takes the pencil and inscribes upon the paper whatever he wishes to be reproduced at the receiving station, where a similar sheet has been placed underneath the receiving pencil. As the pencil at the sending station is moved to and fro the cores of the three magnets A, B, C, are moved in and out of their respective magnets. This varies the magnetic flux in proportion to the amount of movement of the cores. The variations in the magnetic flux changes the amount of current which can go through the line precisely in the same manner as a choke coil does. The variation of the current causes a corresponding increase or decrease of magnetization at the receiving station and hence a similar movement of the cores to that which is taking place in the sending station. The movement of the cores being the same, it will be observed that the movement of the pencil, the motion of which is controlled solely by the cores, will faithfully follow every movement of the pencil at the sending station.

The sending and receiving instruments are practically identical and it is obvious that either can be used to send or receive with equal facility. In order to reduce the friction of the movable parts all the bearings shown are to be of the jeweled type.

I am aware that other forms of the device based upon the same general idea might be made, but I consider as my own and desire to claim all such modifications as fairly fall within the spirit and scope of the invention.

I claim—

1. In a telautograph system, a plurality of sets of magnets, one magnet of each set having a split winding, each branch of said split winding having in series with it one of the other magnets of the set, a source of current connected with one of said split windings, a writing instrument associated with each set of magnets and pivotal connections between the core of each magnet and its writing instrument and electrical connections between the sets of magnets, the said apparatus constituting means for causing a writing instrument of one set to reproduce the motions of the writing instrument of another set.

2. In a telautograph instrument, a plurality of magnets having movable cores, a universal joint connected with all of said cores, a lever pivoted in said joint, and a writing instrument pivotally secured to said lever.

3. In a telautograph instrument, a plurality of magnets having movable cores, a universal joint connecting said cores together, a lever pivoted to said universal joint, a support for said magnets, a second universal joint secured to said support, pivotal connections between the second universal joint and said lever, and a writing instrument pivotally connected to said lever.

4. In a telautograph instrument, a base, a plurality of magnets secured to said base and each provided with a movable core and having their axes extending toward a common center, a universal joint located at said common center and having pivotal connections with each of said cores, a second universal joint secured to said base, a swiveled arm, a writing instrument secured to said swiveled arm, and a lever having pivotal connections with each of said universal joints and with said arm.

5. In a telautograph instrument, a base provided with an opening, three magnets, each having a movable core secured to said base with their axes pointing to a common center, a universal joint having pivotal connections with each of said movable cores, a second universal joint disposed in the opening in said base, a swivel arm, a swivel post secured to said base and swivel arm, a writing instrument secured to said arm, a rod pivotally secured to said arm and arranged to extend through an opening in said swivel post, and a lever having pivotal connections with said arm and with each of said universal joints.

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Witnesses:
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E. ALFRED BURKE.