

N^o 24,227



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Complete Specification Accepted, 10th June, 1915

COMPLETE SPECIFICATION.

An Improved Number Instrument for Automatic and Semi-automatic Telephone Systems.

We, SIEMENS BROTHERS & COMPANY LIMITED, of Caxton House, Westminster, S.W., in the City of London, Electrical Engineers, do hereby declare the nature of this invention (as communicated to us from abroad by Siemens & Halske Aktiengesellschaft, of Siemensstadt, bei Berlin, in the Empire of Germany, Electrical Engineers) and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

The present invention is a modification of the number instrument described in Patent Specification No. 14,614 of 1913 and the present specification forms an addition thereto.

10 In the instrument described in the main specification the arrangement is such that an idle movement is inserted into the forward and return movement of the finger disc and the first current impulse is not transmitted until the dial has traversed a distance in its return movement equivalent to at least twice the space between adjacent finger holes.

15 According to the present invention, in order to obtain the required idle movement, several coupling members are provided between the finger disc and the contact device for transmitting the number impulses and these coupling members are moved forward in succession, and on the release of the finger disc are returned again to their original relative positions and then transmit the movement of the disc to the contact device for sending out the number impulses for setting the selectors on the wanted line. The idle movement of the finger disc corresponds to the sum of the idle movements of the coupling members in their forward and backward movements.

20 According to the invention, the number of coupling members used and the adjustment between successive coupling members determines the length of the idle movement of the finger disc.

A particularly compact arrangement is obtained if the coupling members are arranged as discs rotatable on a common shaft; each disc acting as a driving member for an adjacent disc, so that the whole chain of discs makes one complete rotation during the idle movement of the finger disc. The reduction of the idle movement due to the breadth of the driving member in this arrangement is compensated by an additional idle path interposed between two members of the chain of discs.

30 The arrangement is also simplified, if the chain of discs is connected with the finger disc and the contact device for transmitting the impulses in such a manner that the movement is transmitted from one coupling disc to the next in the same order, both on the forward and return movement of the finger disc.

Preferably also, the arrangement is such, that the contact device is only operated on the return movement of the finger disc and after all the coupling members have returned to their original positions.

[Price 6d.]

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The contact disc for transmitting the impulses is also preferably placed on the same shaft as the coupling members and is held stationary during the idle movement.

Figs. 1 and 2 of the accompanying drawing represent respectively in rear and side elevation a number instrument according to the invention.

Fig. 3 shows on a larger scale and separately the coupling members and their relative positions on the common shaft.

A finger disc B is arranged in known manner on a base plate A and when a finger is inserted in one of the holes it is moved in the direction shown by the arrow until it meets the finger stop C, and on its release is returned to its original position by a spring which is tensioned during the forward movement. In its normal position the disc B is held by a pin D secured to the plate A against a stop E. This stop is connected to a toothed wheel F and by the common spindle to the finger disc B. The wheel F is connected with a governor G of known type and is also connected in the following manner with a contact disc H, which interrupts the impulse contact J twice in every revolution.

The toothed wheel F gears with a small toothed wheel K, on the spindle of which are placed the contact disc H and also the discs L, M, N and O, forming the chain of coupling members which determine the idle movement of the finger disc. The disc O forms a spring and is provided with a driving member P, which in one direction of rotation of the disc O slides over teeth Q on the contact disc H, and in the other direction of rotation takes the disc H with it. Secured to the contact disc H is a disc R, on the front side of which are two notches S in which engage the pins of a forked spring T secured to the bearing of the governor G and thereby to the plate A.

On the forward movement of the finger disc B, the toothed wheel F is rotated and by it the pinion K and the disc L rigidly connected with the latter. As soon as a projection U of the disc L meets the projection V of the disc M, the latter is also set into rotation and when its projection W has reached the corresponding lug X, the disc N is also caused to rotate. When by the rotation of the disc N the edge *a* of a recess *c* on the disc N meets the projection Y of the disc O, the latter is also rotated, and its lug P slides elastically over the teeth Q of the contact disc H which is held by the spring T in its normal position.

After the finger disc B has been released on reaching the finger stop C, the toothed wheels F and K and with them the discs L, M, N, O, H are rotated in the opposite direction. The disc L is the first to be rotated backwards and then when its projection U meets the lug V, the disc M also. When the lug W reaches the lug X of the disc N, the motion of the latter is also reversed and when the edge *d* of the recess *c* comes into engagement with the lug Y it effects the return of the spring disc O. The disc O now takes with it the contact disc H, and the latter interrupts the impulse contact J twice at each revolution. The number of revolutions of the contact disc is determined in known manner by the hole in which the finger was inserted. The construction is such that the angular rotation of the disc from one hole to the next corresponds to a half revolution of the contact disc H. Four idle steps are provided in the construction shown.

The number of the coupling discs can be made the same as the number of the idle steps, and at the same time the additional idle movement for compensating for the breadth of the driving members is determined by the length of the recess *c* relatively to the breadth of the lug Y which engages with it.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. A number dial instrument for automatic and semi-automatic telephone systems, according to Claim 1 of Specification No. 14,614 of 1913, in which, between the number disc and the impulse contact device, there are several members which are operated in succession during the forward movement of the

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said disc and regain their original relative positions on the return movement of the disc, and then transmit the movement of the number disc to the impulse contact device.

5 2. A construction in which the members claimed in Claim 1 consist of discs arranged on a common spindle and in which each disc causes the movement of that next in order.

3. A construction in which the idle movement is directly proportional to the number of the discs referred to in Claim 2.

10 4. A construction according to Claim 2, in which the movement is transmitted from one disc to the next in the same order in both directions of rotation of the number disc.

5. Means by which an additional idle movement is interposed between two of the discs referred to in Claim 2, substantially as and for the purpose set forth.

15 6. Means by which the impulse contact device is held stationary during the idle movement, substantially as described.

7. A number dial instrument substantially as described with reference to the accompanying drawing.

Dated this 17th day of December, 1914,

20 ABEL & IMRAY,
Bank Chambers, Southampton Buildings, London, W.C.,
Agents for the Applicants.

FIG. 1.

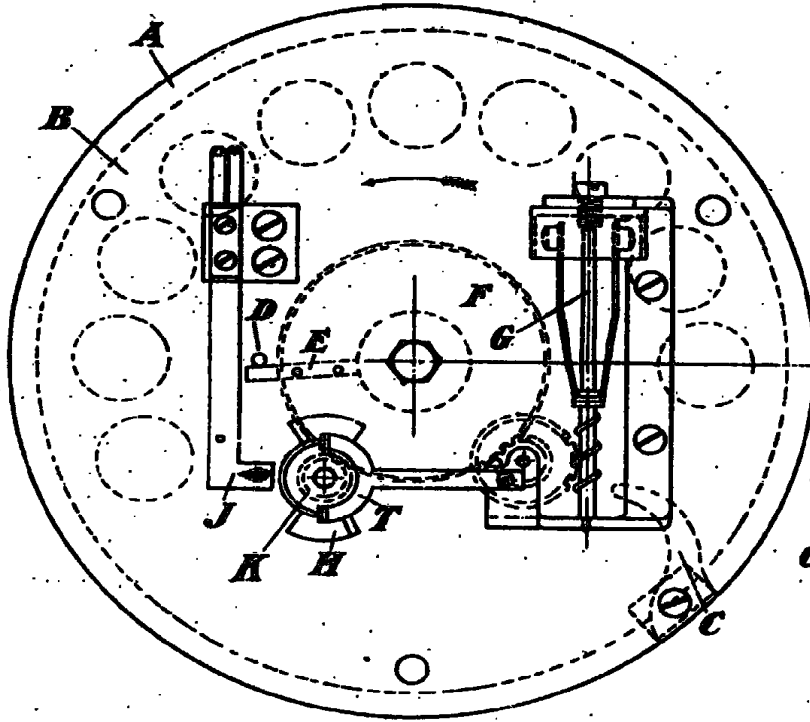


FIG. 2.

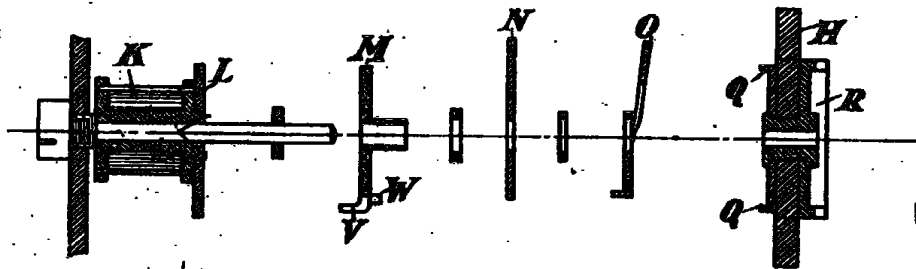
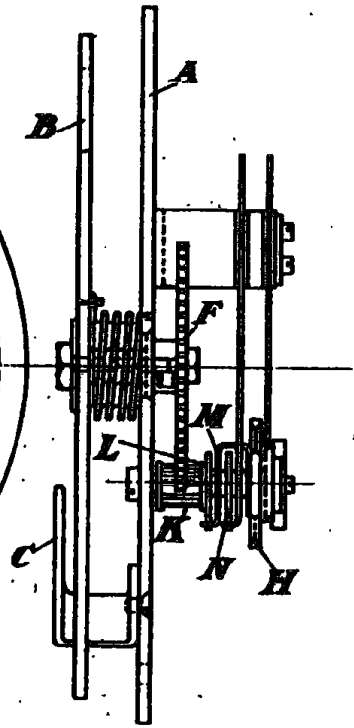
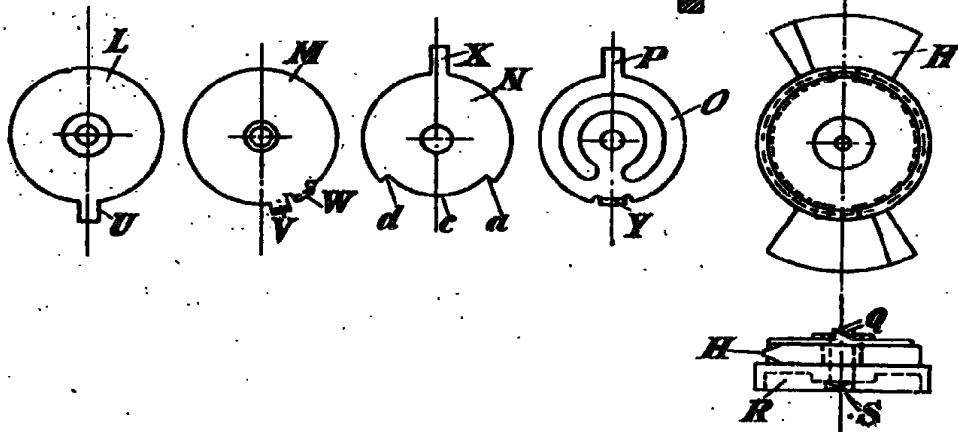


FIG. 3.



[This Drawing is a reproduction of the Original on a reduced scale.]