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P. O. PEDERSEN.
MECHANISM FOR OPERATING THE RECORDING AND REPRODUCING
MECHANISMS OF TELEGRAPHONES.
APPLICATION FILED JUNE 21, 1901.

Fig. 1.

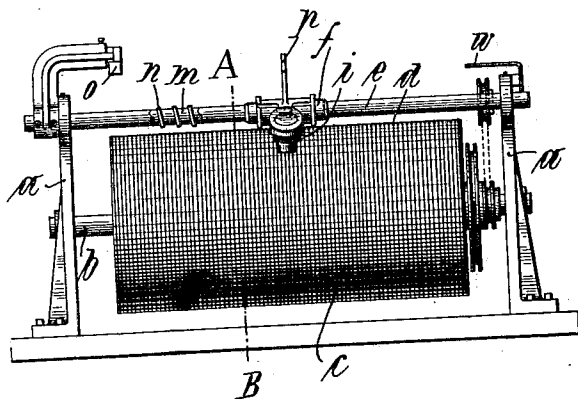


Fig. 2.

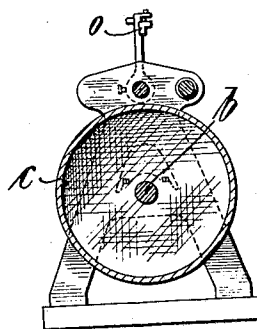


Fig. 5.

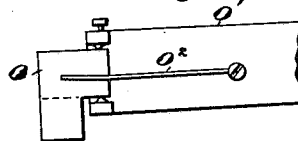


Fig. 4.

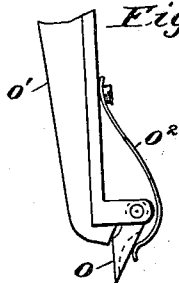
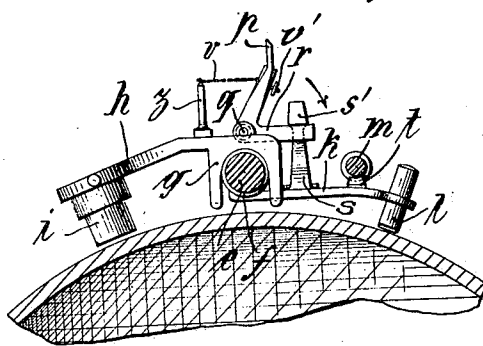


Fig. 3.



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MECHANISM FOR OPERATING THE RECORDING AND REPRODUCING MECHANISMS OF TELEGRAPHONES.

No. 819,670.

Specification of Letters Patent.

Patented May 1, 1906.

Application filed June 21, 1901. Serial No. 65,423.

To all whom it may concern:

Be it known that I, PEDER OLUF PEDERSEN, a subject of the King of Denmark, residing at Copenhagen, in the Kingdom of Denmark, have invented certain new and useful improvements in the mechanism for operating the recording and reproducing electromagnet in apparatus for magnetically recording and reproducing speech, signals, messages, and the like, of which the following is a specification.

This apparatus relates to phonographs, or machines for recording and reproducing speech, messages, or signals, with particular reference to the instrument known as the "telegraphone," which is described in United States Letters Patent No. 661,619, dated November 13, 1900.

The object of the present invention is to produce an automatically-moving carrier for the recording and reproducing magnet, said carrier to be capable of traversing forward and back over the recording-surface as long as the instrument is in motion to record or obliterate a message or reproduce a message as many times as desired.

The particular device herein described is intended especially for an instrument in which the recording-body is in the form of a wire wound spirally upon the surface of a horizontal cylinder. It has been proposed heretofore to feed the magnet along the wire by means of the mechanical engagement between the poles of the magnet and the convolutions of wire, the magnet resting by its weight upon the wire, so that as the cylinder is turned the spiral arrangement of the wire will cause the magnet to be moved along on its guides. In the present case the engagement between the magnet and the wire is not relied upon to move the magnet, but instead thereof an independent element connected with the same carriage which supports the magnet engages with the spirally-wound wire to move the carriage and magnet across the face of the cylinder in one direction, while in the other direction the same device is used in connection with a separate reverse screw or spiral to return the carriage and magnet to its starting-point.

The present invention also provides automatic devices at each end of the cylinder to shift and trip the feed devices so that the direction of motion will be reversed.

The invention will be fully described in connection with the accompanying drawings, in which—

Figure 1 is a front elevation of a telegraphone with my improvements attached thereto. Fig. 2 is a section on line A B of Fig. 1. Fig. 3 is a sectional view of the carriage and a portion of the cylinder. Figs. 4 and 5 are a plan and elevation of the reversing mechanism at one end of the cylinder.

The standards *a* support the horizontal shaft *b*, upon which is mounted the cylinder *c*, whose surface carries a spirally-wound magnetizable wire *d*, extending from end to end thereof. The cylinder is to be continuously rotated in any suitable way, a pulley being shown at one end for this purpose. Above the cylinder and parallel thereto are arranged a smooth rod *e* and a second rod *m*, having a spiral thread *n* on it from end to end, said spiral being of much coarser pitch than that of the wire *d*. On the rod *e* is a sleeve or carriage *f*, to which is attached a rearwardly-extending arm *k*, which passes below and beyond the rod *m*, and carries at its outer end a tooth *l*, directed toward and adapted to engage with the wire *d*, the tooth being weighted, as shown, to afford a good mechanical connection with the wire. On the upper side of arm *k* is another tooth or half-nut *t*, adapted to engage with the thread on the rod *m*.

s is an upwardly-reaching spring-arm having a head *s'*, affording a shoulder on its under side, forming a hook. On the upper side of sleeve *f* is pivoted at *q* a bell-crank *r*, having one arm projecting rearwardly and closely beside the spring *s* and the other projecting upwardly and having a finger *p*. When the rearwardly-projecting arm of the bell-crank is tipped sufficiently low, the head *s'* on the spring-arm will pass over and rest upon its upper edge, preventing the arm from rising until it is released.

g g are two forks resting over the extremities of the sleeve *f* and connected together by an arm *h*, which also supports the recording and reproducing magnet *i*, the latter being thus free to swing on the sleeve *f*. On the upper side of arm *h* is a post *z*, the end of which connects with the upwardly-projecting arm of the bell-crank *r* by means of a chain *v*, which is adjustable in length by means of the screw *v'*, to which its end is attached. When the bell-crank is engaged by

the hook *s'*, the weight of the magnet *i* and arm *h*, acting through the parts *v*, *r*, *s*, and *k*, lifts the tooth *l* out of engagement with the wire *d* and holds the half-nut *t* in engagement with the thread on the rod *m*. At the same time in order that the bell-crank may engage with the hook *s'* it must tip so far rearward as to lift the magnet *i* well out of contact with the wire *d*, so that when the magnet falls back and lifts arm *k* it is prevented from touching the wire *d* by nut *t* resting against the rod *m*. On the other hand, when the hook *s'* is out of engagement with the bell-crank both arms *h* and *k* are allowed to fall and carry their respective parts *i* and *l* into engagement with the wire *d*, which is the operative condition when recording, reproducing, or obliterating.

At the left-hand end of the instrument is a bracket *o'*, to which is pivoted on a vertical axis a blade *o*, normally held in a plane oblique to the axis of cylinder *c* by a spring *o²*. The lower half of this blade is in the path of movement of the finger *p* on the bell-crank *r*, and this portion of the blade is thinner than the upper portion, its thickness being indicated by the dotted lines in Fig. 4. In its normal position the blade rests against a portion of the bracket *o'*, as shown in Fig. 4, in which position the blade is adapted to be struck near its forward edge by the said finger *p* in its traverse to the left. The bell-crank is thereby tilted rearward, owing to the inclined position of the blade, and is thrown beneath the hook *s'*, where it is caught. Thus the movement of the carriage to the left is interrupted and its movement to the right simultaneously commenced. In starting to the right the finger *p* strikes the opposite side of the blade *o*, which then yields on its pivot and allows the finger to pass. At the right-hand end of the cylinder a bent arm *w* is fixed, with its end in the path of movement of the head *s'* on arm *s*, so that when the carriage completes its extreme movement to the right the hook *s'* is struck and moved out of engagement with the bell-crank, whereupon the magnet *i* and the tooth *l* are allowed to fall into engagement with the wire *d*.

In the operation of the instrument the cylinder *c* and the rod *m* are continuously rotated. To record speech, the speaking should usually commence when the carriage is at the right-hand end of the cylinder. As the speaking continues the carriage is fed along toward the left by the mechanical engagement between the tooth *l* and the spiral wire *d*. At the same time the poles of the magnet *i* are dragging in contact with the same wire. When the wire has been completely traversed by the magnet, the carriage is at the left-hand end of the cylinder. The bell-crank is then tilted rearward by the blade *o* and the direction of movement of the

carriage is reversed, the carriage traveling quickly toward the right-hand end of the cylinder by reason of mechanical engagement between the half-nut *t* and the rod *m*. As soon as the carriage reaches the right-hand end of the cylinder its direction of movement is again reversed by contact with the arm *w* and the record previously made will now be reproduced, while the carriage again travels to the left. The carriage will continue to travel forward and back until the motor which drives the cylinder is stopped, and as many reproductions of the record can be made as desired.

Having described my invention, I claim—

1. In a phonographic apparatus, the combination with the record-receiving surface or body, and a carriage movable with respect to each other, said carriage adapted to carry a recording or reproducing device, of means independent of said recording or reproducing device, and actuated by the said record-receiving surface or body, for moving the carriage and surface or body with respect to each other.

2. In a phonographic apparatus, the combination with a record-receiving surface or body, of a recording or reproducing device acting upon one part of said surface or body, and a feeding device acting upon another part of said surface or body for the purpose of feeding the recording or reproducing device with respect to said surface or body.

3. In a phonographic apparatus, the combination with a record-receiving surface or body in the form of a spiral, a carriage for the recording and reproducing devices, devices adapted to engage with the record-receiving surface or body to cause a movement of the carriage and means for reversing the direction of movement of the carriage at the end of a traverse.

4. In a phonographic apparatus, the combination with a record-receiving surface in the form of a spiral, of a carriage, a recording or reproducing device coöperating with said surface or body and supported by said carriage, and a tooth also supported by said carriage and adapted to engage with said spiral surface or body for the purpose of moving the carriage when the surface or body rotates.

5. In a phonographic apparatus, the combination of a record-receiving surface or body in the form of a spiral, a threaded rod arranged parallel thereto, a carriage for the recording and reproducing feeding devices, devices carried by said carriage for engaging with either the recording body or surface or the threaded rod, and means for lifting the said devices out of engagement with the rod and into engagement with the surface or body and vice versa.

6. In a phonographic apparatus, the combination of a record-receiving surface or body, a carriage adapted to carry the recording and

reproducing devices, means connected with said carriage and adapted to engage with the record-receiving surface or body to move the carriage, and means for lifting the recording or reproducing devices out of operative relation with said surface and reversing the direction of travel of the carriage.

7. In a phonographic apparatus, the combination with the record-receiving surface or body, of a carriage, two arms carried thereby and pivoted so as to rest against the record-receiving surface or body, recording and reproducing devices carried by one arm and a feeding device carried by the other arm and means for lifting said arms out of contact with said surface or body, for the purpose set forth.

8. In a phonographic apparatus, the combination with a record-receiving surface or body, a traveling carriage, two pivoted arms projecting from said carriage, one of said arms carrying the recording or reproducing devices and the other engaging with the recording-surface in order to move the carriage, a latch adapted to hold the two arms out of operative relation with the recording-surface and means located at the extremities of the record-receiving surface or body for re-

spectively engaging and disengaging the said latch.

9. In a phonographic apparatus, the combination with a record-receiving surface or body, and a guide-rod arranged parallel thereto, of a sleeve on said guide-rod, an arm projecting from said sleeve and carrying a feeding device adapted to engage with the record-receiving surface or body for the purpose of moving the sleeve along the rod, a second arm loosely connected with said sleeve and adapted to carry the recording and reproducing devices, the said two arms projecting from opposite sides of the sleeve, a lever pivoted to the sleeve and connected with the second-mentioned arm, a latch carried by the first-mentioned arm and adapted to be engaged by said lever, whereby the two arms may be connected together so that the weight of one will offset that of the other and means for engaging and disengaging said latch.

In testimony whereof I have hereunto set my hand in the presence of two witnesses.

PEDER OLUF PEDERSEN.

Witnesses:

E. S. HAZEMANN,
V. POULSEN.