May 23, 1933. G. K. FISKEN 1,910,685

TELEPHONE MESSAGE RECORDING DEVICE

Filed June 10, 1929 3 Sheets-Sheet 1

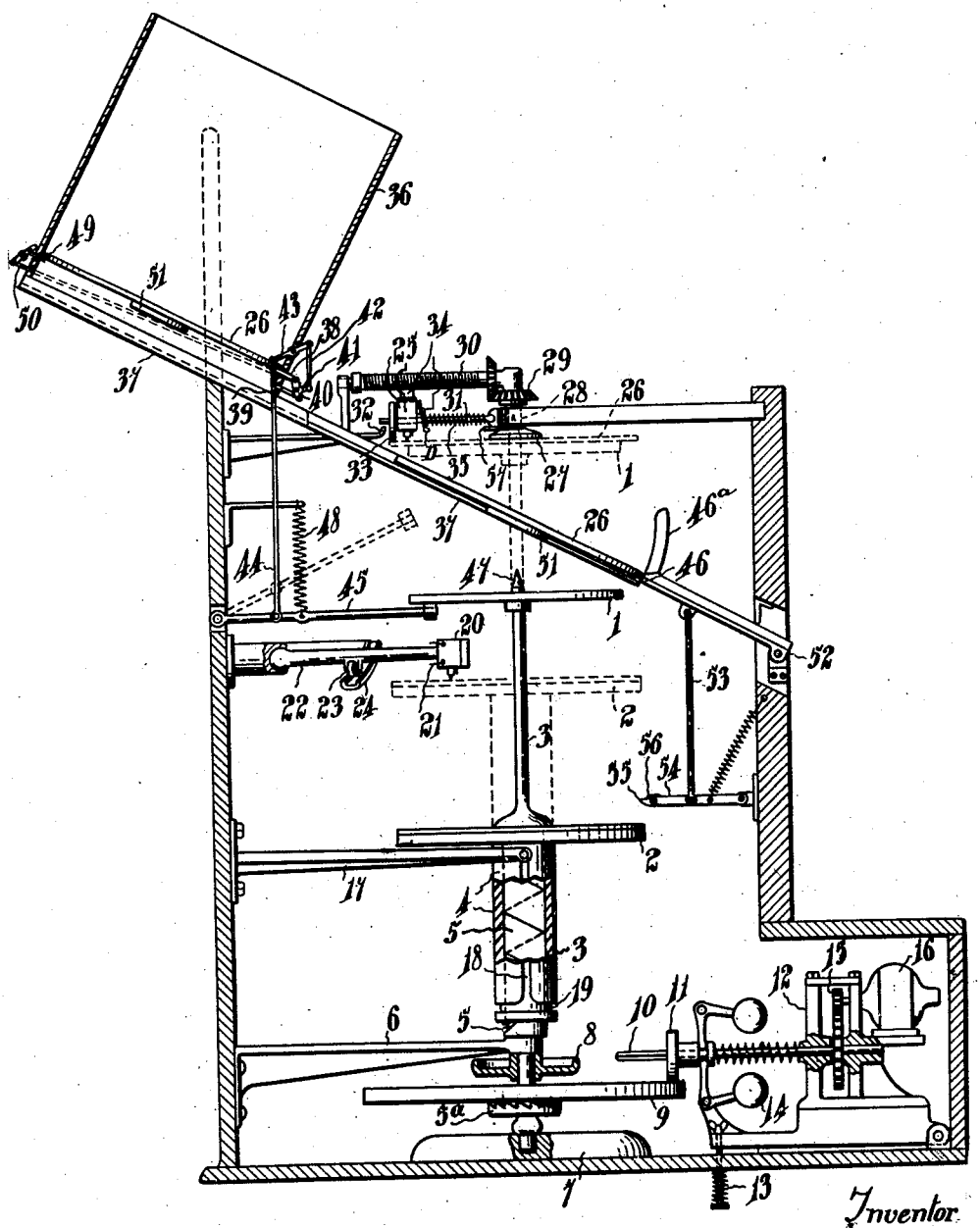


Fig. 1.

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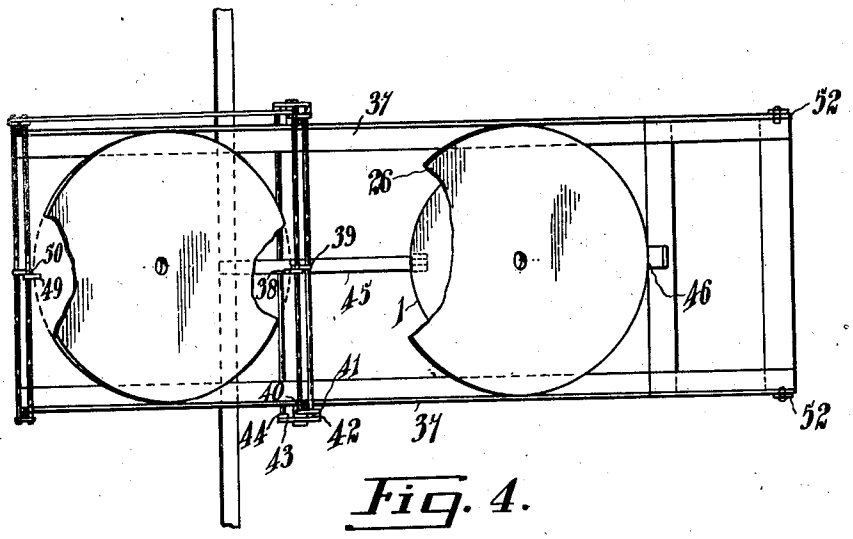


Fig. 4.

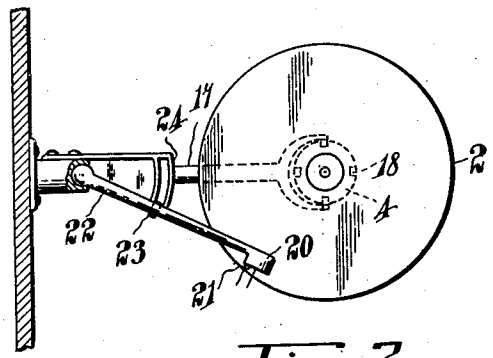


Fig. 2.

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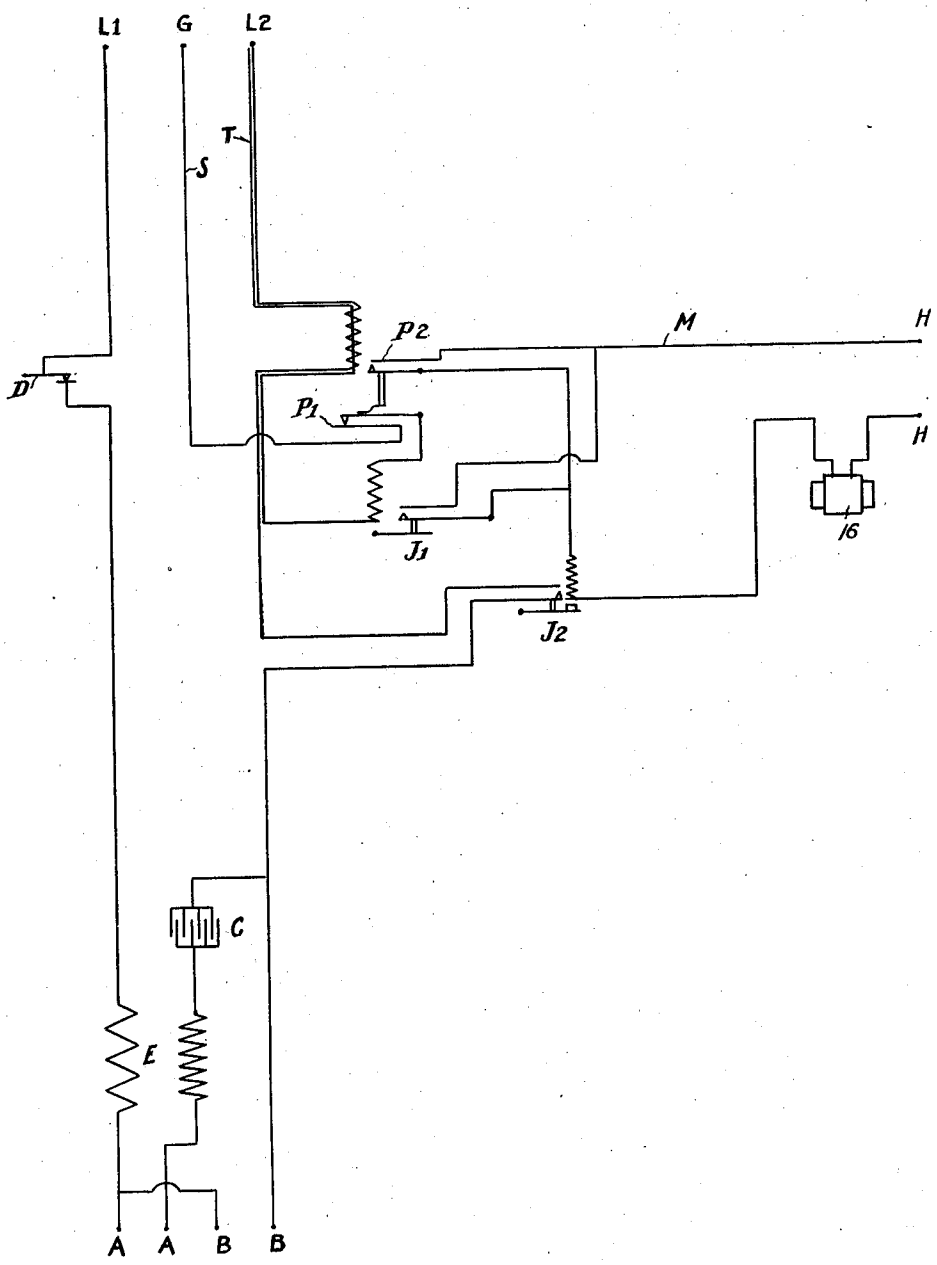


Fig. 3.

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UNITED STATES PATENT OFFICE

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TELEPHONE MESSAGE RECORDING DEVICE

Application filed June 10, 1929. Serial No. 369,677.

My object in the present invention is to provide apparatus for automatically answering telephone calls and for recording for subsequent reproduction any messages spoken by the caller.

I attain my object by means of constructions which may be briefly described as follows. The apparatus includes a permanent talking machine record and an associated electric reproducer which are conditioned for operation by the ringing circuit of a telephone to answer a call. The apparatus also includes a turntable adapted to release recording disks from a magazine and bring them one-by-one into co-operation with recording mechanism adapted to record a message sent following a call.

In the construction shown the permanent record and the turntable are co-axially arranged and together are moved axially to and from their operative positions. The permanent record is arranged not only to answer the call but also to announce when the end of the receiving capacity of a recording disk is reached. The parts return to their initial position then or, if the caller break the telephone lines connection, on another call being received the permanent record and the turntable are moved again to their operative position with a fresh recording disk in position on the latter.

The whole is constructed as hereinafter more specifically described and as illustrated in the accompanying drawings in which

Fig. 1 is a side elevation, partly in section, of apparatus constructed in accordance with my invention;

Fig. 2 a plan view of the recording disk feed mechanism;

Fig. 3 a wiring diagram; and

Fig. 4 a plan view of the reproducer mechanism.

The main elements of the construction are the reproducing and recording devices, the mechanism for actuating the same, and the mechanism for feeding recording disks for use. The reproducing apparatus includes a turntable 2 to which is secured or on which is formed a permanent record of the announcements the apparatus is expected to make to a caller; first of all an announcement that the apparatus is ready to receive; and secondly, an announcement that the end of the recording disk has been reached and that the device must go through the process of dropping a used recording disk and picking up a new one before it is again ready for action. The recording device also includes a turntable 1. These turntables 1 and 2 are carried in axial alinement by a carrier 3 which includes a sleeve 4. This sleeve, in the operation of the device, is required to move axially and also to rotate.

To impart these movements to the carrier I provide a threaded spindle 5 which is threaded into the sleeve 4, the thread being of quick pitch so that a comparatively few revolutions of the spindle would elevate the carrier 3 and the turntables carried thereby the required distance. The spindle is mounted in bearings 6 and 7. Beneath the upper bearing is located an oil pan 8 to prevent lubrication from the bearing 6 dripping down onto a friction disk 9, secured to the spindle 5. This friction disk is driven from a motor driven shaft 10 to which is secured a friction wheel 11 bearing on the upper surface of the friction disk 9. As it is desirable that the friction wheel should be resiliently held in contact with the friction disk, the shaft 10 is mounted on a frame 12 hinged on the base of the apparatus and provided with an adjustable tensioning spring 13 engaging the frame and the base.

For purposes of regulation to maintain a constant speed of the spindle 5 when the apparatus is reproducing or recording, I provide the shaft 10 with a centrifugal governor 14 of known type, adapted to shift the friction wheel 11 longitudinally of the shaft 10 as the speed of the shaft increases or decreases. The friction wheel 11 is of course mounted to slide on but not to rotate relative to the shaft 10. The shaft 10 is driven by suitable gearing 15 from the electric motor 16.

When the carrier 3 is to be moved axially of the spindle 5, it is necessary that it be held from rotation. For this purpose I provide a fork 17 adapted to engage in any one pair

of the longitudinal grooves 18 formed in the exterior of the sleeve 4. As the longitudinal motion must cease and the carrier rotate with the spindle during reproducing and recording, I form a groove 19 at the lower end of the sleeve with which the grooves 18 communicate. As soon as the carrier is raised high enough for the fork ends to enter this groove, the carrier will be rotated as its upward movement is stopped. The upward movement necessarily stops as soon as the fork 17 passes out of the grooves 18 and the carrier then rotates with the spindle, being frictionally driven and supported by means of the thread thereof. When rotary movement of the carrier ceases it rotates backward down the thread of the spindle till the fork again enters the grooves. Thereafter its motion is rectilinear and as it falls it rotates the spindle backwards, and as it is undesirable to have the burden of rotating the driving mechanism backward imposed on the carrier, I prefer to incorporate a one-way clutch 5^a of any known type in any suitable position; for example, as a connection between the spindle 5 and the disk 9.

In its raised position the permanent record 2 is in co-operative relationship with an electric reproducer 20 of any known type of which reproducer 21 is the electrical circuit which, as hereinafter described, will be connected with the talking line of a telephone. This electric reproducer is carried by an arm 22 hinged on a suitable stationary part. This arm is normally supported by means of an anti-friction roller 23 adapted to run on an inclined track 24, the inclination being such that when the reproducer is not in engagement with the permanent record the arm will run down the track and return the reproducer to its initial position ready for co-operation with the beginning of the record.

The turntable 1, when the carrier is raised and the permanent record of the table 2 is in contact with the reproducer, is in close proximity to the electric recorder 25, which is of any ordinary type known to phonograph art. The turntable in its upward movement picks up the recording disk 26 in the manner hereinafter described, and presses this disk firmly against a rubber faced friction disk 27 secured to a vertical spindle 28 journalled in a stationary part. This spindle 28, through the medium of the bevel gearing 29, drives the horizontally journalled screw 30, which serves to move the recording device 25 across the surface of the recording disk 26.

The electric recorder 25 is mounted to slide on a bar 31 hinged at its inner end on a stationary part and adapted when the recorder is not in operation, to rest on the bracket 32 secured to a suitable stationary part. The bar has also mounted thereon an anti-friction roller 33 adapted to roll on the upper surface of the recording disk 26. When the record is pressed into engagement with the disk 27, the recorder is lifted into engagement with the screw 30 by the engagement of the roller 33 with the upper surface of the disk and, as the recorder is provided with the half nut 34, the recorder will be fed inwardly across the surface of the disk as long as the disk is rotating. When the turntable ceases to rotate and the disk thereon is removed from engagement with the friction disk 27, the recorder drops out of engagement with the screw 30 and is returned to its position by means of the spring 35 secured to the recorder and to the stationary part.

The device is provided with means for feeding recording disks 26 and removing them from the turntable 1. I show for this purpose a magazine 36 which is suitably supported with its bottom inclined as shown to the longitudinal axis of the apparatus. The bottom is in alinement with guides 37 on which opposite edges of the recording disks will slide.

An escapement device is provided for releasing the disks one-by-one from the magazine. For this purpose I show two slides 38 and 39 connected to opposite ends of a lever 40 so that by rocking the lever the slides may be projected towards the magazine to engage and disengage the lowermost disk in the magazine.

The lever 40 is actuated through the medium of any suitable link and lever combination by the turntable 1. I show for this purpose a rock arm 41 secured to the lever 40, which rock arm is connected by means of a link 42 with a lever 43 fulcrumed between its ends, which lever at its other end is connected with a link 44 pivotally connected with a lever 45 fulcrumed on a suitable stationary part and adapted to be engaged by the underside of the turntable 1. When the turntable is in its lowermost position the slide 38 is projected inwardly beneath the lowermost disk in the magazine while the slide 39 is withdrawn.

A recording disk 26 has slid out of the bottom of the magazine and is resting against the stop 46 arranged as hereinafter described. When the turntable is moved upwards its central projecting point 47 will enter the central hole in the recording disk and the upper surface of the turntable will lift the recording disk from the guides and raise it into contact with the friction disk 27 as hereinbefore described. As the turntable rises, the escapement operating parts are actuated through the medium of a spring 48 secured to a stationary part and any suitable moving part of the escapement mechanism, such for example as the lever 45. This movement of the escapement mechanism retracts the slide 38 and projects the slide 30 so that the disk previously supported by the slide 38 drops into engagement with the slide 39 ready to be dropped onto the guides the

next time the slide 38 is projected and the slide 39 is withdrawn by the lowering of the turntable 1.

It is desirable that the escapement should engage at opposite sides of a disk. I therefore provide the slides 49 and 50, which may be connected by lever and link mechanism to operate respectively with the slides 38 and 39. It will also be noted that each recording disk is provided with a hub 51 which maintains them in spaced relationship in the magazine and thus facilitates the entrance of the slides 38, 39, 49 and 50 between the disks. It is of course necessary that the turntable 1 should be smaller in diameter than the recording disks to allow it to pass between the guides 37 when picking up or dropping a disk.

The stop 46 is hinged at 52 on a suitable stationary part. Normally the stop 46 has its upper end slightly raised to engage the edge of a recording disk but it may be drawn down to a position in alinement with the plane of the guides 37 so that the recording disks may slide over it to a suitable receptacle, not shown. This stop must be actuated somewhat before the escapement mechanism is actuated to discharge a fresh recording disk onto the guides 37. For this purpose I show the stop as connected by a link 53 with a lever 54 fulcrummed on a stationary part and projecting towards the path of the permanent record turntable 2. This lever has an end 55 hinged thereon by means of a rule joint so that it will yield upwardly but not downwardly, and which is normally pressed to its normal position by means of a spring 56. Thus, as the permanent record turntable 2 descends it will engage the end 55 and rock the lever 54 and thus lower the stop 46. On its upward movement, however, the permanent record hinges up the pivoted end 55 and passes by without affecting the stop 46. A coil spring tends to maintain the stop in a recording disk engaging position. To prevent a recording disk slipping down after it has been released from the stop 46 and before it is engaged by the center pin of the turntable, I provide the fixed stop 46^a which is engaged by the edge of a record as soon as it is disengaged from the stop 46.

The apparatus is controlled from the circuits of the telephone with which it is connected through suitable electric circuits which are capable of considerable variation. I show a suitable arrangement for this purpose in Fig. 3 of the drawings.

In this diagram L', L^2 are the talking circuit terminals of a telephone line, and G, L^2 the terminals of the signal circuit, A, A are the terminals of the electric recorder 25, and B, B, the terminals of the electric reproducer 20. The talking circuit T includes the induction coil E and the condenser C as usual in telephone systems. The signal circuit S has its return through part of the talking circuit and includes a relay J' controlling the circuit M of the motor 16, H, H being the connections for this circuit with a house lighting circuit.

In the talking circuit T is included a double relay P', P^2 adapted, when the talking circuit is energized, to break the signal circuit at P^1 and close the motor circuit at P^2. It will be noted, however, that the energizing of the motor circuit M closes the relay J^2, which closes the talking circuit T and, as the coil of the relay P', P^2 is included in the talking circuit, the energizing of the talking circuit holds the motor circuit closed at P^2 though the signal circuit is broken at P' and the relay J' opened, the contact P^2 being in a shunt circuit past the relay J'. D is a mechanical contact breaker carried by the electric recorder 25 adapted to be opened by contact with a stationary part 57 when the reproducer has arrived at a predetermined point in its inward travel, thus breaking the talking circuit, which action breaks the motor circuit at P^2 and allows all relays to return to their initial positions.

The mode of operation it will be seen is as follows. The sending of a calling signal over the telephone line to which the apparatus is connected closes the circuit of the motor 16 by means of the relay J'. The closing of the motor circuit closes the talking circuit through the relay J^2. The closing of the talking circuit maintains the closure of the motor circuit at P^2. The motor circuit and talking circuit then remain closed until the circuit is mechanically broken at D. So also if the talking circuit is broken by the caller, the motor circuit is broken at P^2 and the parts of the apparatus returned to their normal position.

When the motor circuit is energized as hereinbefore referred to, the carrier 3 is elevated through the medium of the gearing system hereinbefore described, the rate of drive being controlled through the medium of the governor mechanism and friction drive. As soon as the two turntables have been raised to operative position, the movement of elevation ceases and the turntables are rotated to call and receive as hereinbefore referred to. As soon as the talking circuit is broken, the parts drop to their initial position. The turntable 2 when raised and lowered effects the changing of recording disks as hereinbefore described.

From the above description it will be seen that, when the apparatus described is connected with a telephone line, as soon as a call is received the device is set in operation and after a brief interval calls back to the caller an announcement that the device is ready to receive. The caller then speaks his message, which is recorded on a recording disk which will usually be proportioned to take a four minute message. If the caller desire more

time, he will be told by the reproducer to break the connection and ring in again when the device again announces that it is in condition for a completion of the message.

What I claim is:

1. In automatic speech recording mechanism the combination of a permanent record; a reproducer; a recording disk; a recording device; a turntable adapted to support the recording disk; means for bringing the record and reproducer and also the recording disk and recorder into co-operative relationship; means connecting the permanent record and the turntable; and means for moving said permanent record and turntable axially to bring them into co-operative relationship with the reproducer and recorder respectively and for thereafter rotating them.

2. In automatic speech recording mechanism the combination of a carrier; a permanent record carried thereby; a turntable also carried by the carrier co-axial with but spaced from and above the permanent record; means for raising, lowering and rotating the carrier and the parts carried thereby; an electric reproducer into co-operative engagement with which the permanent record is brought by the raising of the carrier; a magazine for recording disks; an escapement device adapted to be actuated to discharge disks one-by-one from the magazine; guides adapted to receive disks as discharged and to guide them across the path of the turntable; movable stop mechanism adapted to releasably hold a disk in position to be picked up by the turntable; means whereby the escapement is actuated by one of the reciprocating parts; a sound recording device into co-operative engagement with which the turntable is adapted to lift a record lying on the guides; and means for releasing the stop, actuable by one of said parts, to allow a used recording disk to pass down the guides.

3. In automatic speech recording mechanism the combination of a rotatable permanent record; a turntable; a recording disk; means for feeding said disk to a position over the turntable and concentric therewith; means for engaging the disk with the turntable; a reproducer normally disengaged from the record; a recording device; means for bringing the reproducer and recording device into cooperative relationship with the record and recording disk respectively; means for feeding the recording device across the disk; and means for rotating the record and recording disk.

4. In automatic speech recording mechanism the combination of a permanent disk record; a reproducer; a recording disk in axial alinement with the record; a recording device; a turntable adapted to support the recording disk; means for bringing the record and reproducer and also the recording disk and recorder into co-operative relationship by relative movement normal to the disk surfaces; and means for simultaneously rotating both the permanent record and the turntable, the turntable being axially movable to engage it with the disk and the disk with the reproducer.

5. In automatic speech recording mechanism the combination of a permanent disk record; a reproducer; a recording disk in axial alinement with the record; a recording device; a turntable adapted to support the recording disk; means for bringing the record and reproducer and also the recording disk and recorder into co-operative relationship by relative movement normal to the disk surfaces; and means for simultaneously rotating both the permanent record and the turntable, the turntable being axially movable to engage it with the disk and the disk with the reproducer and the record axially movable with and rotatable with the turntable.

6. In automatic speech recording mechanism the combination of a permanent disk record; a reproducer; a recording disk in axial alinement with the record; a recording device; a turntable adapted to support the recording disk; means for bringing the record and reproducer and also the recording disk and recorder into co-operative relationship by relative movement normal to the disk surfaces; and means for simultaneously rotating both the permanent record and the turntable, the turntable being axially movable to engage it with the disk and the disk with the reproducer; and means for feeding disks to and from a position in axial alinement with the turntable by the axial movements of the latter.

Signed at Waterloo, Ontario, this 7th day of May, 1929.

GRAEME KEARNEY FISKEN.