No. 879,288. PATENTED FEB. 18, 1908.

W. C. MAYO & J. HOULEHAN.

ANNUNCIATOR.

APPLICATION FILED MAY 22, 1907.

4 SHEETS—SHEET 1.

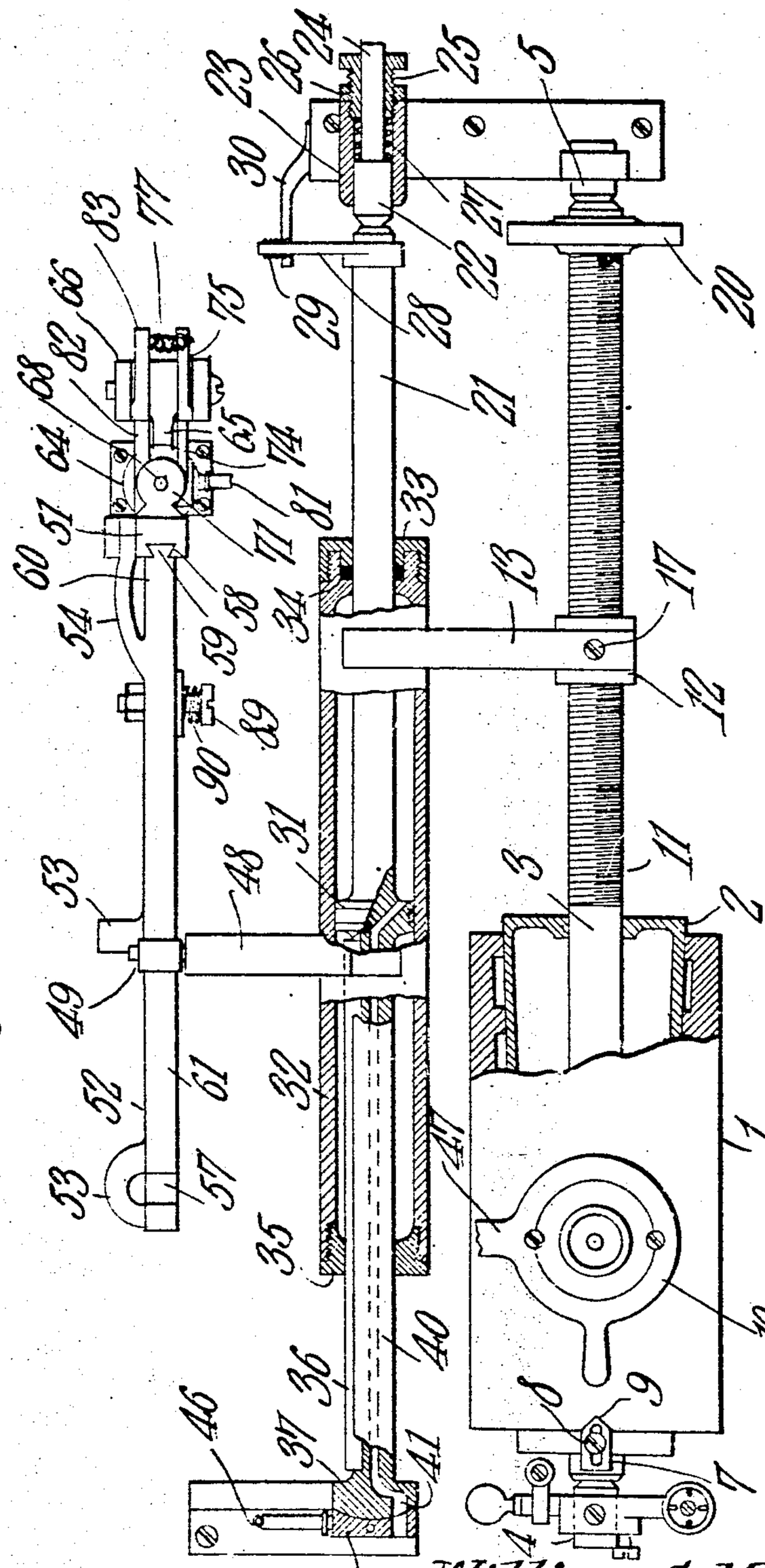

Fig. 1.

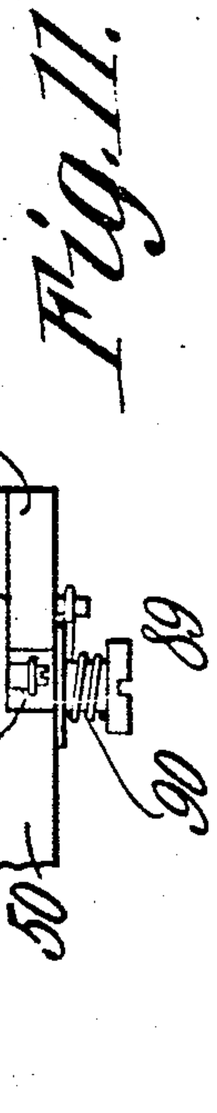

Fig. 11.

WITNESSES:

E. F. Bleistadt

F. T. Chapman

William C. Mayo
John Houlehan
INVENTORS

BY C. A. Snow & Co.

ATTORNEYS

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4 SHEETS—SHEET 2.

Fig. 2.

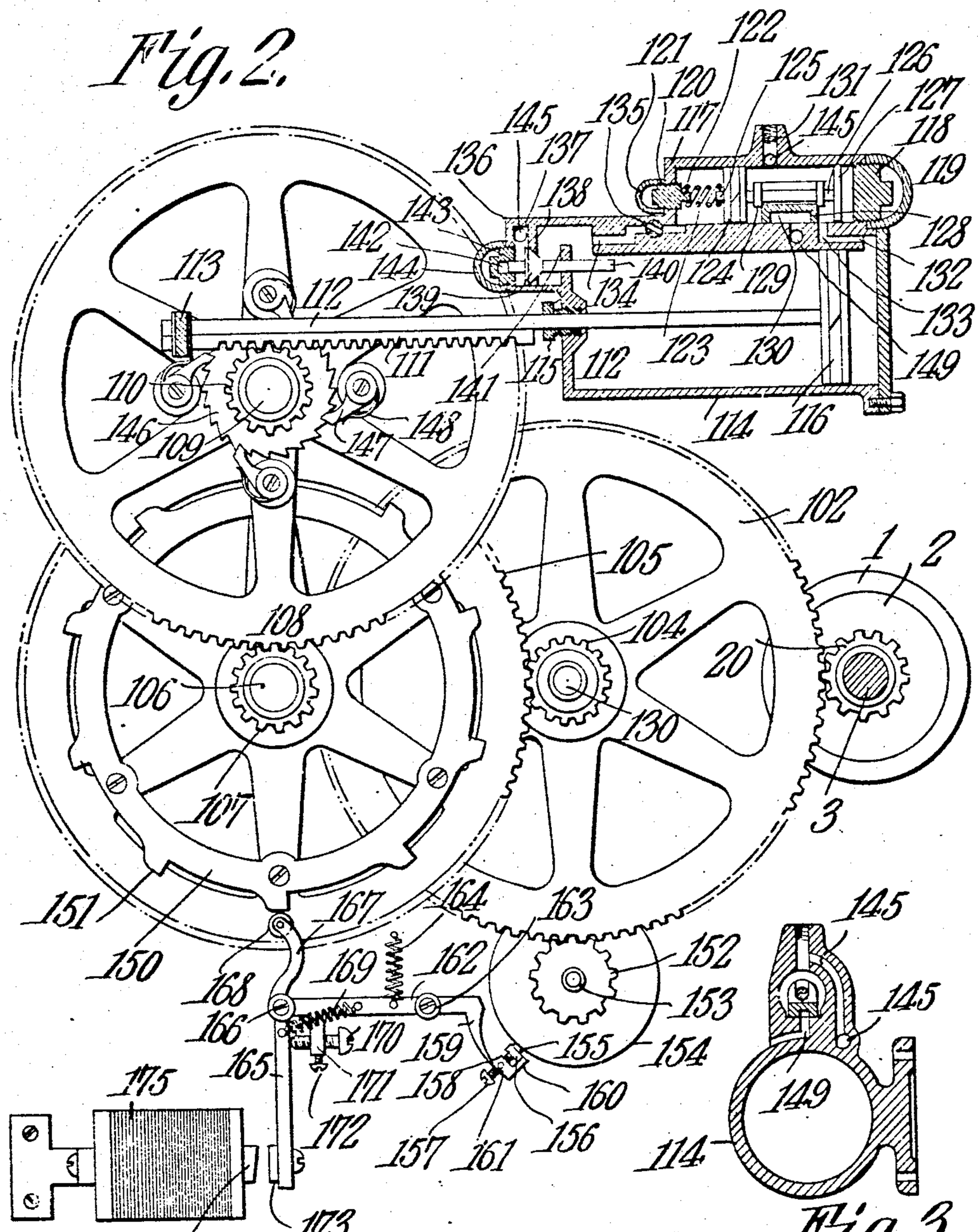

Fig. 3.

WITNESSES:

E. F. Holcomb

F. G. Chapman

William C. Mayo
John Houlehan
AND
INVENTORS.

By Chapman & Co.

ATTORNEYS

No. 879,288. PATENTED FEB. 18, 1908.

W. C. MAYO & J. HOULEHAN.

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4 SHEETS—SHEET 3.

Fig. 4.

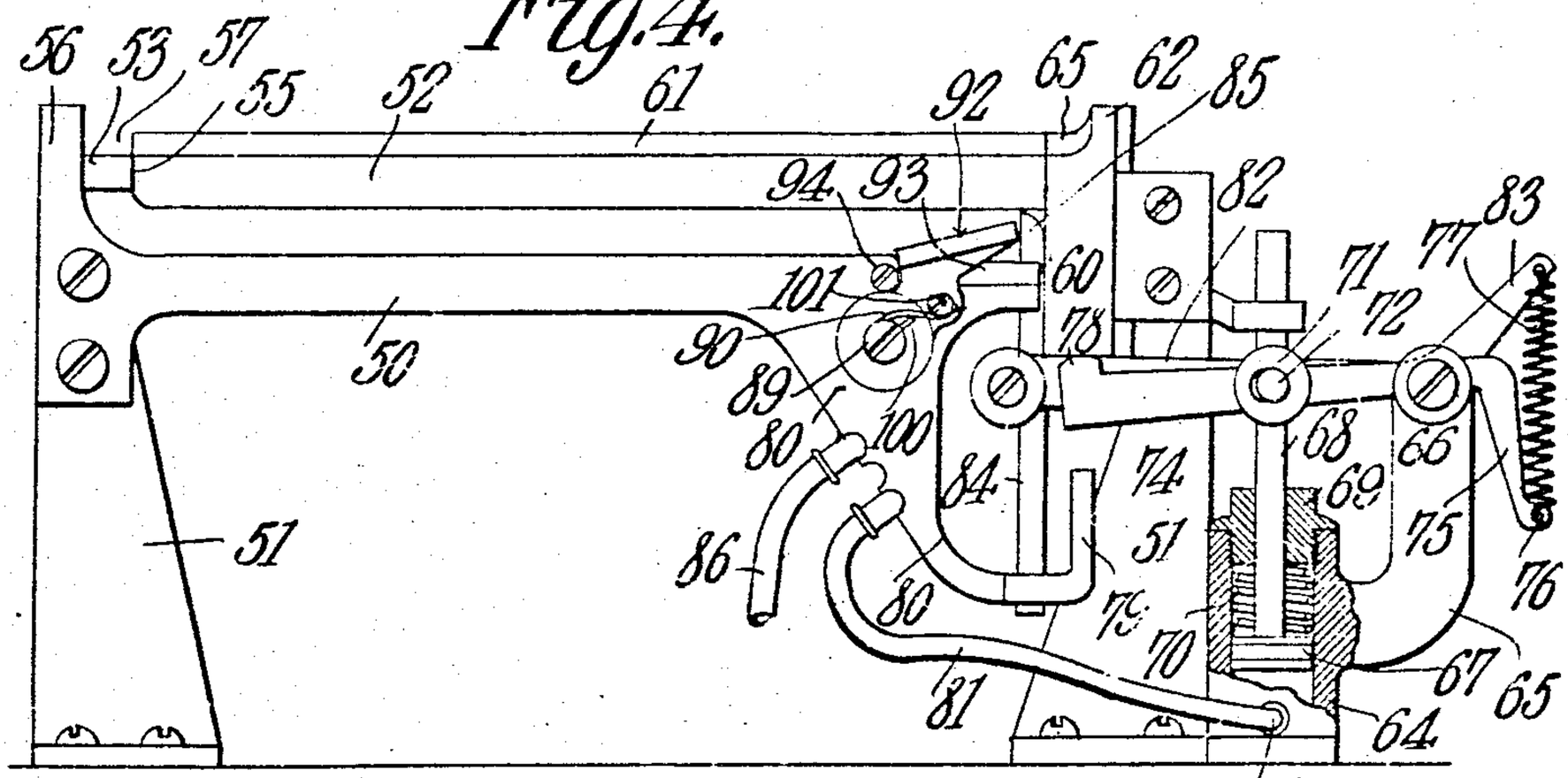


Fig. 5.

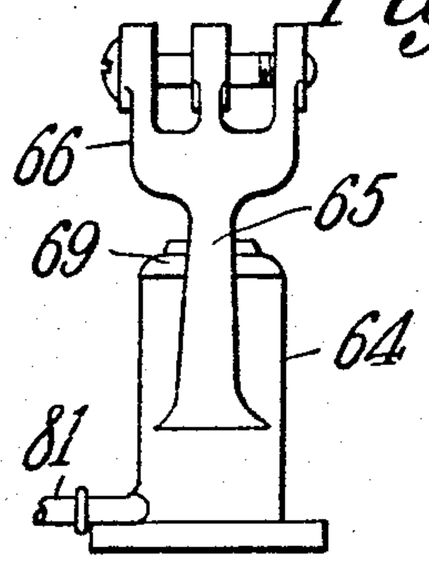


Fig. 6.

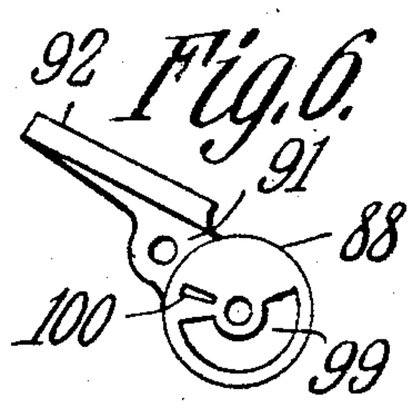
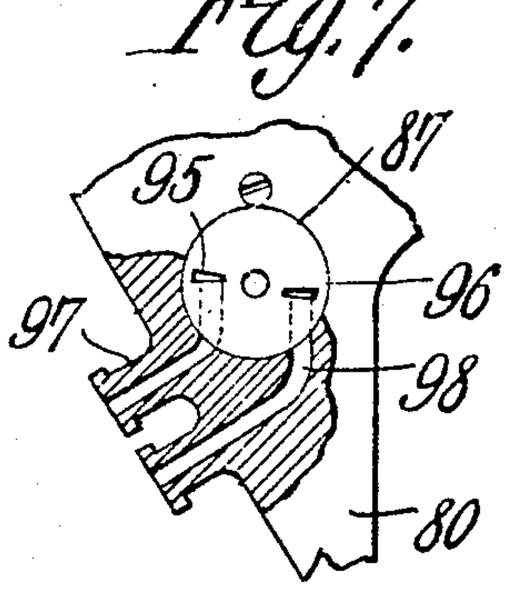


Fig. 7.



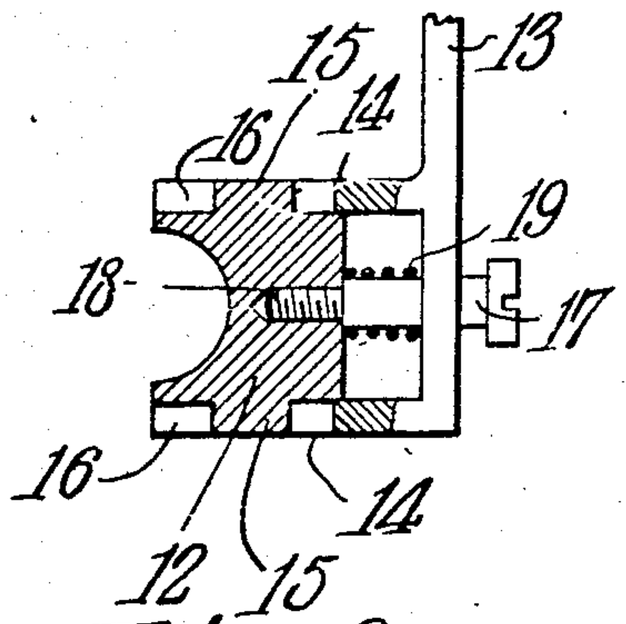


Fig. 8.

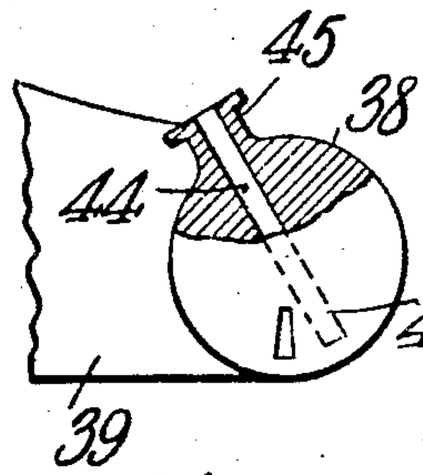


Fig. 9.

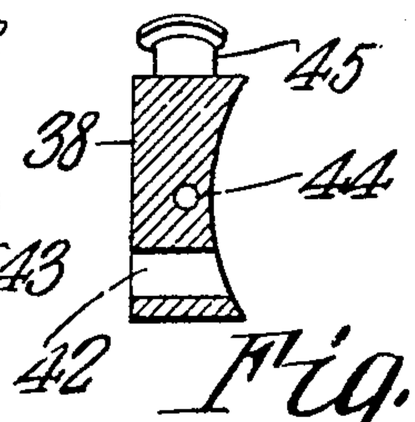


Fig. 10.

WITNESSES:

E. F. Holland

F. T. Chapman

William C. Mayo
John Houlehan
INVENTORS

By Chapman & Co.

ATTORNEYS

No. 879,288. PATENTED FEB. 18, 1908.

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ANNUNCIATOR.

APPLICATION FILED MAY 22, 1907.

4 SHEETS—SHEET 4.

Fig. 12.

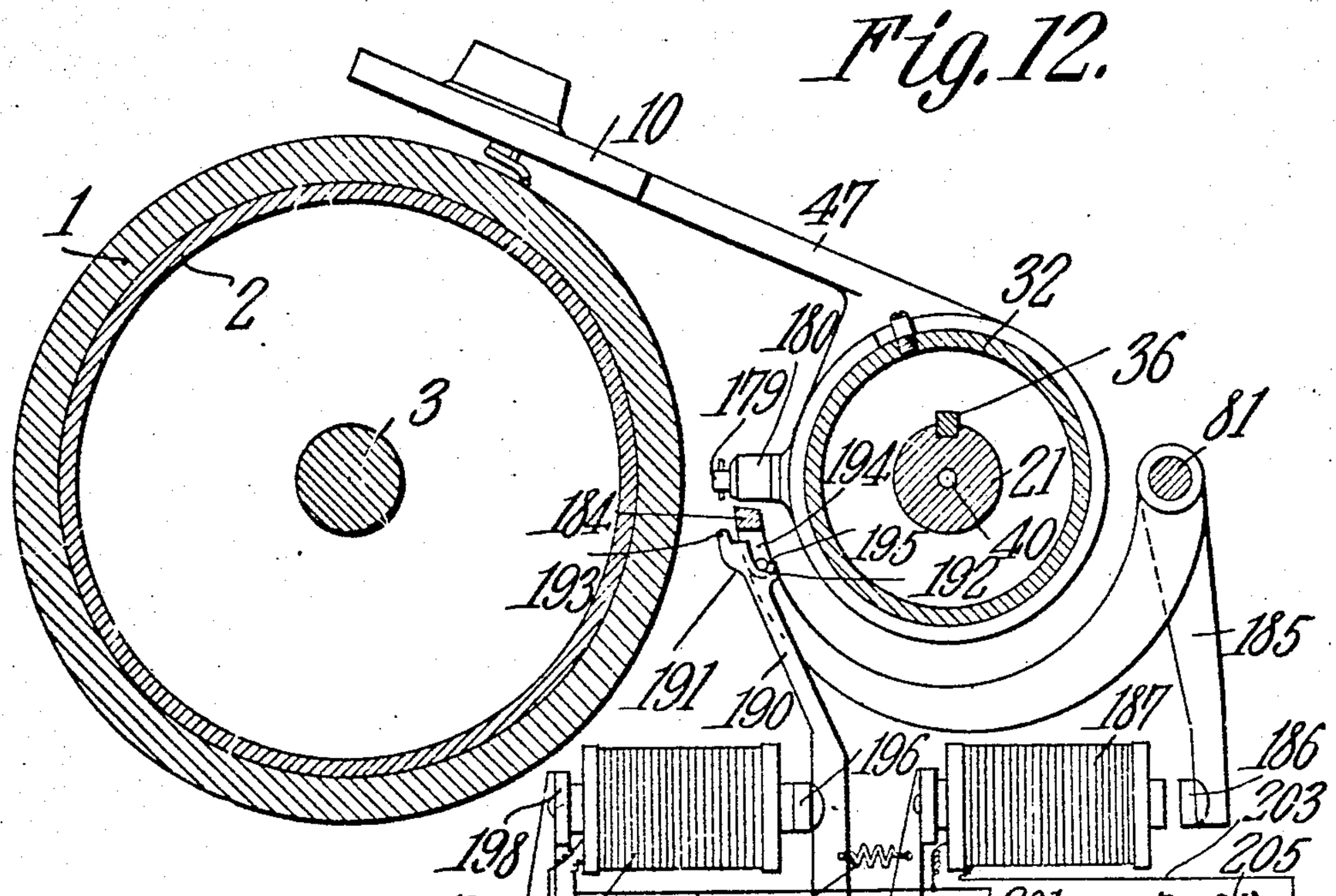

Fig. 13.

Fig. 14.

William C. Mayo & John Houlehan

INVENTORS

WITNESSES:

E. G. Stewart

F. T. Chapman

By C. A. Snow & Co.

ATTORNEYS

UNITED STATES PATENT OFFICE.

WILLIAM C. MAYO AND JOHN HOULEHAN, OF EL PASO, TEXAS, ASSIGNORS OF ONE-THIRD TO GEORGE E. BRIGGS, OF BARSTOW, TEXAS.

ANNUNCIATOR.

No. 879,288. Specification of Letters Patent. Patented Feb. 18, 1908.

Application filed May 22, 1907. Serial No. 375,090.

To all whom it may concern:

Be it known that we, WILLIAM C. MAYO and JOHN HOULEHAN, citizens of the United States, residing at El Paso, in the county of El Paso and State of Texas, have invented a new and useful Annunciator, of which the following is a specification.

This invention has reference to improvements in annunciators designed more particularly for the phonographic announcing of stations and other routine information on cars or trains of any character.

The invention is designed for use in connection with a complete traction system which we have devised, and since in this system the operations are mostly automatic in character, it becomes necessary that all announcements, such as the names of stations, calls to meals, and other matters which are usually called out by a train official shall be made by phonographic means and shall be so timed and arranged that each passenger shall surely hear the announcement.

In the system in which these annunciators are designed to be used it is impracticable to use spring motors for the purpose of driving the instruments and so connections are made with the air system of a train whereby the air pressure, which, in accordance with our general system is constantly maintained, is employed to drive the various parts of the annunciator and to actuate the several parts which are necessary for the fully automatic operation of the devices comprised in the present invention.

The present invention comprises a sound-reproducing means utilizing a sound record, preferably of the cylindrical type although with slight modifications the same instrumentalities may be used in connection with sound records of the disk type. In either case the sound records should be of material capable of numerous reproductions, but as such record materials are found on the market and sound record tablets have been made from such materials, it is unnecessary to consider herein the character of the record.

The invention comprises a means under the control of the air pressure in the system used for braking and other purposes, for setting up rotary motion of the cylindrical sound record and feeding the sound-box across the record to such extent and at such times as may be necessary to cause the desired announcements to be made.

In order that the announcements may be made at the proper time, the motor for the phonographic annunciator may be under the control of a release mechanism which may be operated from fixed points along the roadway; and provision is also made for conducting the reproduced sounds to points adjacent to the seats occupied by the passengers on the car so that each passenger may receive an individual announcement in spoken words.

The invention will be best understood by a consideration of the practical embodiment thereof, and, therefore, we will proceed to describe such practical embodiment in connection with the accompanying drawings forming part of this specification, in which drawings,

Figure 1 is a plan view, with parts in section, of a phonographic reproducer of the cylindrical record tablet type arranged to operate automatically as many times as desired; Fig. 2 is a skeleton view of the driving mechanism for the structure shown in Fig. 1; Fig. 3 is a cross section of the cylinder for receiving air for driving the mechanism; Fig. 4 is an elevation, partly in section, of the mechanism employed for returning the sound-box to its initial position after having traversed the length of a record cylinder; Figs. 5 to 11, both inclusive, are detail views of various parts of the mechanism; Fig. 12 is a sectional view, partly in diagram, of a means for silencing the reproduction without throwing the mechanism out of action; Fig. 13 is a plan view of a portion of the same; and Fig. 14 is a detail view of a portion of the structure shown in Fig. 12.

Referring to the drawings, and more particularly to Fig. 1, there is shown a cylindrical record tablet 1 of the ordinary type upon which there are presumed to be such announcements as desired, say the announcements of the stations being approached and their character, and such other announcements as it may be desirable to make.

Since our system contemplates the elimination, to a great extent, of train attendants, it becomes, of course, imperative that the announcements be made at the proper times and in proper sequence and that a single record should contain all the announcements that are to be made during a trip, and, in reverse order, for the return trip where it is not practicable to change the record at the end of a run. For this reason the record 1 will,

of course, be made of sufficient size for the purpose.

The record 1 is mounted upon a mandrel 2 such as is usually employed in connection with sound-reproducing machines of the cylindrical record type, and this mandrel is fast on a shaft 3 journaled in a suitable bearing 4 at one end and in a suitable bearing 5 at the other end. These bearings may be of the pointed-pin type to reduce friction and to insure the centering of the shaft. The bearing 4 may be provided with the usual gate mechanism 6 whereby the bearing may be removed from the shaft sufficiently to allow the removal and replacing of the record 1 upon the mandrel 2. Since this gate may be of the usual type, it is unnecessary to describe it in detail.

It will be seen that it is necessary that the record tablet should always be placed upon the mandrel in the same relative position thereto, and for this purpose there is secured to the smaller end of the mandrel a slotted plate 7 by means of a thumb-screw 8, or, if desired, an ordinary screw, passing through the slot in the plate 7. One end of this plate 7 is pointed, as indicated at 9, and enters a notch formed in the end of the record tablet 1.

There is provided a sound-box 10 which may be of the ordinary reproducer sound-box type, and, therefore, needs no description here, but the manner of supporting this sand-box and of operating the same to bring it into proper relation with the record will appear further on.

Between the mandrel and the bearing 5 the shaft 3 is provided with a continuous screw-thread 11, after the manner of the ordinary reproducing machine using cylindrical records, and adapted to this screw-thread there is a half-nut 12, best shown in Fig. 8. This half-nut 12 is at the end of an arm 13 terminating in two parallel fingers 14 appropriately spaced apart. The half-nut 12 is composed of a suitably shaped block seated between the fingers 14 and provided with lugs 15 projecting into slots 16 formed in the free ends of the fingers 14 so that this half-nut may move longitudinally between the fingers 14 but can have no other movement with relation thereto. It will be understood, of course, that though the lugs 15 are shown about midway of the half-nut 12 they may be otherwise located, and other means for guiding the half-nut 12 between the fingers 14 may be provided. Extending through the arm 13 between the fingers 14 is a screw 17 having an elongated, smooth shank and a short screw extension 18, which latter enters a suitable nut formed in the body of the half-nut 12 to such an extent that the shoulder formed by the junction of the shank 17 with the screw extension 18 abuts against the rear of the half-nut 12. Surrounding the shank of the screw 17 between the half-nut 12 and the inner face of the arm 13 there is a helical spring 19 tending to maintain the half-nut in its outermost position but yielding when the nut engages with the screw-threads 11 on the shaft 3, so that the nut may be firmly seated on the screw-threads without danger of being displaced therefrom by the shocks incident to the movement of the car.

Mounted upon the end of the shaft 3 near the bearing 5 is a gear pinion 20 by means of which a rotative movement is imparted to the shaft 3 in a manner to be described with relation to Fig. 2 and to which reference will be made further on.

Parallel with the shaft 3 there is another shaft 21 which, because of the fact that it makes but a partial revolution in operation, will hereinafter be referred to as a rock-shaft. One end of this rock-shaft is carried by a pointed bearing 22 consisting of a cylindrical block housed in a fixed sleeve 23 upon a suitable support coming from the base plate of the machine, which latter is not shown in the drawings. The block 22 is provided with a reduced stem 24 extending through the sleeve 23 and also through a bushing 25 having exterior threads fitted to other threads tapped into the end of the sleeve 23, and this bushing is held in place by a lock nut 26. Surrounding the stem 24 within the sleeve 23 and confined between the end of the block 22 and the inner end of the bushing 25 there is a helical spring 27. Fast on the rock-shaft 21 adjacent to the bearing 22 is an arm 28 connected by a suitable spring 29 to a bracket 30 fixed on the support of the sleeve 23 or coming from any other adjacent fixed portion of the machine, and the spring 29 is of sufficient strength to at all times tend to rock the shaft 21 in a direction to cause the arm 28 to approach the bracket 30.

About midway of the length of the rock-shaft 21 it is formed with a piston 31 and the rock-shaft carries a hollow cylinder 32 inclosing said piston 31. That end of the cylinder 32 toward the bearing 22 is closed by a packing gland 33 inclosing suitable packing 34 to render this end of the piston air-tight where it surrounds the shaft 21. The other end of the piston is closed by a simple screw-head 35 serving to maintain the cylinder in concentric relation to the shaft 21. In order that the cylinder 32 may not turn upon the shaft 21, although movable longitudinally thereon as will hereinafter appear, the shaft 21 is provided with a spline 36 passing through a suitable slot in the head 35. This spline 36 is of sufficient length to permit the full longitudinal movement desired for the cylinder 32.

The end of the rock shaft 21 remote from the end supported by the bearing 22 is formed into a head 37, the end face of which is curved

on the arc of a circle, and this end face fits the similarly curved face of a fixed bearing 38 on the end of a standard 39 fast on the base or other fixed part of the machine. The bearing 38 is best shown in Figs. 9 and 10. Extending through the shaft 21 from the head 37 to and through the piston 31 is a conduit 40, and this conduit at the head 37 opens into a port 41. The bearing 38 is provided with a through port 42 and another port 43 alongside of the through port 42 but leading radially, by means of a duct 44, through the bearing to a coupling head 45 from which leads a pipe 46 to a source of air supply under pressure, which may be the air pressure supply for the brake system of the train and for other purposes. Now, when the rock-shaft 21 is moved about its axis in the manner to be hereinafter described, the port 41 will be brought into coincidence with one or the other of the ports 42 and 43 in the bearing head 38. The sound reproducer box 10 is secured to the cylinder 32 by means of an arm 47 so as to be supported by and move with said cylinder, and the arm 13 carrying the half-nut 12 is likewise secured to said cylinder to be supported by and move therewith.

The relation of the several parts is such that when the rock-shaft 21 is moved under the action of the spring 29 and the cylinder is likewise moved with the rock-shaft, the port 41 is brought into coincidence with the port 43 and air under pressure therefore is admitted by the conduit 40 to the side of the piston 31 adjacent to the packing gland 33. The result is that the reaction of this compressed air will force the cylinder toward the right as viewed in Fig. 1 and this movement will continue until stopped by means to be hereinafter described, which means also cause the movement of the rock-shaft 21 on its axis in a direction to bring the sound-box into operative relation with the beginning of the sound record 1 and to bring the half-nut 12 into operative relation to the screw-threads 11. This last movement of the rock-shaft 21 brings the port 41 into coincidence with the port 42 in the head 38 and as this port 42 is open to the air the supply of compressed air within the cylinder, admitted through the conduit 40, now exhausts through the port 42 and the cylinder is free to be moved under the action of the screw-threads 11 and nut 12 in a direction to cause the reproduction of the sounds recorded in the tablet 1.

In order to provide for the maintenance of the half-nut 12 in contact with the screw-threads 11 and for the maintenance of the sound-box 10 in operative relation to the record groove in the tablet 1, and to disconnect both the half-nut 12 and the sound-box 10 from their respective parts of the reproducing mechanism when the end of the record is reached, and to return the sound-box and half-nut to the beginning of the record and screw-threads respectively and to put them in operative relation thereto, there is provided a means which will now be described, this means being shown in Figs. 1, 4, 5, 6, 7 and 11.

Fast on the cylinder 32 about midway of its length there is an arm 48 projecting in a direction opposite from that of the arms 13 and 47, and this arm 48 terminates in a roller 49. In the path of this roller there is a track 50 suitably supported upon posts 51 rising from the base plate or other fixed portion of the machine, and at a higher level and overlying the track 50 there is another track 52 secured to the track 50 by yokes 53 and to one of the standards 51 by a yoke 54, the two tracks thus being parallel but spaced apart, while, for a purpose which will hereinafter appear, the track 52 is shorter than the track 50 and terminates at one end 55 at a short distance from an upturned end 56 of the track 50 to form a throat 57 between these ends of the tracks, while at the other ends the tracks terminate in the same vertical plane. The upper end of the standard 51 adjacent to the two matched ends of the track sections 50 and 52 is formed with a dovetail slot 58 receiving a dovetail tongue 59 on a sliding block 60 movable from a position coincident with the top of the track 50 to a point coincident with the top of the track 52.

It will be observed that the top of the track 50 is level while the top of the track 52 is inclined, as indicated at 61, and the top of the block 60 is formed with an upturned stop lug 62 and the upper end of this block 60 is also inclined, as shown at 63, similar to the inclined face 61. Now, let it be supposed that the roller 49 is traveling along the inclined track surface 61. In this position the roller itself is inclined and bears evenly on said track. The direction of travel of the roller 49 under the impulse of the screw 11 is toward the left as viewed in Fig. 4, and ultimately this roller reaches the throat 57 and drops down therethrough to the track 50. Since the arm 48 carrying the roller 49 moves through an arc about the axis of the rock-shaft 21, the drop from the track 52 to the track 50 brings the roller 49 into good bearing contact with the level surface of the track 50. In this position of the parts the cylinder 32 is impelled by the air pressure toward the right as viewed in Figs. 1 and 4, and the roller therefore travels toward the right along the track 50 until it reaches the right-hand end thereof.

It is necessary now to consider the structures disposed at the right-hand end of the tracks 50 and 52. Adjacent to the corresponding standard 51 there is a cylinder 64 having formed on one side a bracket 65 terminating at the upper end in a twin-head 66. Within the cylinder there is located a piston

67 at the lower end of the piston-rod 68 passing through a suitable screw-plug 69 at the upper end of the cylinder, which screw-plug constitutes a bearing for the piston-rod 68. Interposed between the upper face of the piston 67 and the lower face of the screw-plug 69 there is a helical spring 70, the purpose of which will presently appear. The upper end of the piston-rod 68 is passed through a suitable bearing formed in a bracket 71 fast in the upper end of the standard 51 at this end of the structure. The piston-rod 68 is provided with a side stud 72 engaging in a suitable bearing 73 formed in a lever arm 74 pivotally supported in one portion of the twin-head 66. This lever arm is extended beyond its bearing in the twin-head 66 and is there provided with an angle arm 75 terminating in an eye 76 receiving one end of a spring 77 to be hereinafter referred to. The other end of the lever 74 is formed into a head 78 arranged to engage under the block 60, and a stop 79 formed on one end of a bracket 80 extending downward from the track 50 is arranged in the path of this block 60 so that it may descend for only a definite distance which is sufficient to bring the track surface 63 coincident with the surface of the track 50. The lower end of the cylinder 64 receives the end of a pipe 81 coming from a valve mechanism to be presently described. The action of the spring 70 before referred to is to depress the piston 67 and thereby carry the lever 74 to its lowermost position until the block 60, which is of sufficient weight to fall by gravity, is arrested by the stop 79.

Pivotally supported in the twin-head 66 is another lever 82 having an arm 83 extending away from said head and connected to the end of the spring 77 remote from the end connected to the arm 75. The other end of the lever 82 is pivotally connected to a slide 84 mounted at the lower end in a suitable guideway in the bracket 80 and at the upper end passing through a suitable guideway in the corresponding end of the track 50 and adjacent to the block 60.

Assuming that the piston 67 is at its lowermost point of travel, the levers 74 and 82 are also depressed and the block 60 has its track section 63 coincident with the track 50, and the slide 84, the upper end 85 of which is shaped as shown, is also lowered to such an extent that the said end 85 is below the level of the upper surface of the track 50.

Returning now to the roller 49, which when last spoken of was supposed to be approaching the end of the track adjacent to the block 60. This roller, continuing its travel toward the right, ultimately passes upon the track section 63 of the block 60, being stopped by the lug 62. When the roller has reached this point it has caused, in a manner to be presently described, the air to be admitted through the pipe 81 to the lower side of the piston 67 in the cylinder 64. This air coming from the train service pipe is under pressure and lifts the piston 67 against the action of the spring 70 and thereby causes the lever 74 to also move upward. However, the head 78 of the lever 74 is so related to the block 60 that in the initial position of the lever 74 the head 78 is some distance below the lower end of the block 60. Consequently, the lever 74 must move some little distance before it engages the block 60. This causes the arm 75 to move away from the arm 83 and thereby the spring 77 is put under tension until it overcomes the weight of the lever 82 and the slide 84, which latter is moved up until it reaches the lower side of the track 52 in which position it is in the path of the roller 49 and the latter is effectually prevented from returning to the track 50. By the time this movement has been accomplished the head 78 of the lever 74 has come in contact with the block 60 and then the continued upward movement of the piston 67 forces the block 60, together with the roller 49 and arm 48, upward until the track section 63 is coincident with the inclined surface 61 of the track 52, the end of the track 52 preventing the roller 49 from elevating the track 63 after it has passed the upper end 85 of the slide 84.

Now, in order to insure the operation of the piston 67 there is provided in the bracket 80 a valve mechanism by means of which air coming from a suitable source of air pressure through a pipe 86 is directed to the pipe 81 and then the air supply is cut off from the pipe 81 and the air in the cylinder 64 is permitted to escape. For this purpose there is mounted in the bracket 80 a rotary valve, best shown in Figs. 6 and 7. This valve consists of a fixed seat member 87 and a rotary member 88 held to the member 87 by means of a suitable screw 89, and the rotary valve member 88 is held in a certain normal position by means of a spring 90 carried by the screw 89 and engaging said rotary member 88. Fast on the rotary member 88 there is an arm 91 having an extended bearing surface 92 arranged to engage in a recess 93 in the track 50, but normally held out of this recess by the spring 90 before referred to, a stop-screw 94 determining the extent of travel of the arm 91 away from the recess 93.

The fixed member 87 of the valve is provided with two ports 95 and 96, the port 95 being in communication through a suitable duct 97 with the air supply pipe 86, while the port 96 is in communication through a suitable duct 98 with the pipe 81 leading to the cylinder 64. In the face of the valve member 88 there is formed an arc-shaped groove 99 and adjacent thereto is a through port 100. The meeting faces of the two members 87 and 88 of the valve are ground true so as to

make an air-tight joint, and the member 88 is held with its face against the face of the member 87 by means of the spring 90 which presses against the movable member 88 and holds it in close contact with the member 87. One end of this spring may be carried around a pin or screw 101 on the member 88 in such manner as to hold it in position to close all the ports, in which position the arm 91 abuts against the pin or screw 94.

When the valve just mentioned is in its normal position the bearing surface 92 is in line with the track 50 but extends above the same in the path of the oncoming roller 49. However, in this position of the valve the ports 95 and 96 are in communication through the groove 99 and the piston 67 is therefore acted upon by the compressed air and the block 60 is in its uppermost position, as shown in Fig. 4. Moreover, the slide 84 is also elevated so that its end 85 is in the path of the oncoming roller 49. Before, however, the roller 49 reaches the stop end 85 of the slide 84 it passes upon the bearing surface 92 of the valve member 88 and, depressing this bearing surface 92, causes the valve member 88 to turn upon its axis to a sufficient extent to carry the groove 99 out of coincidence with the port 96 and to bring the exhaust port 100 into coincidence with the port 96. The air in the cylinder 64 is therefore exhausted through the port 100 and the piston 67 is depressed by the spring 70. This action causes the levers 74 and 82 to fall and the block 60 also falls until arrested by the stop member 79. Moreover, the slide 84 has likewise been depressed until its end 85 is out of the path of the roller 49. Under these conditions the track section 63 of the block 60 is in line with the top of the track 50 and the roller is free to enter this track section 63. Now, however, the roller has passed off from the bearing surface 92 of the valve member 88 and this latter member turns on its axis under the impulse of the spring 90. The first action is to connect the ports 95 and 96 with the compressed air supply and compressed air is introduced below the piston 67. This latter member then rises, first putting the spring 77 under tension and thereby causing the end 85 of the slide 84 to be projected into the path of the roller 49, thus preventing the latter from again moving on to the track 50. Immediately afterward the end 78 of the lever 74 engages the lower end of the block 60 and elevates the same, together with the roller 49, to coincidence with the surface 61 of the track 52. As before stated, the upward movement of the roller 49 acting through the arm 48 has caused the cylinder 32 on the shaft 21 to rock upon the axis of the latter, thus bring the half-nut 12 into engagement with the threads 11 and the reproducing stylus of the sound-box 10 into engagement with the beginning of the record groove on the record tablet 1. Now, as the shaft 3 is rotated in a manner to be described the sound-box 10 is fed across the record tablet 1 until ultimately the throat 57 at the end of the track 52 is reached, when the roller 49, moving thereinto under the action of the spring 29, causes the sound-box and half-nut to be raised from the tablet and feed-screw respectively and the sound-box and feed nut are again returned so that the sound-box is in operative relation with the beginning of the record tablet in the manner already described.

Before passing on to the description of the driving mechanism for the structure just described, it may be well to note that the packing 34 for the cylinder 32 need not be thoroughly air-tight since there is a large excess of power from the air entering said cylinder and some leak at this point is immaterial. But it is material that there should be as little friction as possible in the active movement of the cylinder 32 when propelled in the proper direction to cause the reproduction of the record under the action of the screw 11, since now the air pressure no longer acts directly to furnish the propelling power, and, therefore, it is advisable to reduce the resistance at all points where there may be resistance offered to the operation of the machine. For this reason the packing 34 may be of any suitable substance that will answer the purpose and a good, loose graphite packing may be sufficient.

It will be observed that the shaft 21 has its bearing 22 constantly urged toward the shaft 21 by the spring 27. This serves to maintain the contiguous faces of the head 37 and the bearing 38 in close contact, and as these faces are carefully ground to an air-tight fit such fit is maintained by the spring 27 during the rotative movement of the shaft 21. It is advisable to retard the movement of the cylinder 32 on its return movement to the position to bring the sound-box to the beginning of the record. When the roller 49 falls through the throat 57 the half-nut 12 is not immediately lifted out of engagement with the screw 11 because of the action of the spring 19 which causes the said half-nut to remain in contact with the screw 11 until just an instant before the roller 49 reaches the bottom of the throat 57 in position to enter upon its return travel along the track 50. However, the port 43 has been brought into coincidence with the port 41 and air pressure is established in the end of the cylinder 32 beyond the piston 31. Ordinarily, the cylinder 32 would move quickly along the shaft 21 but there is quite a body of air confined between the piston 31 and the head 35 of the cylinder. This head 35 fits the shaft 21 sufficiently close to form a good bearing but there is provided a certain amount of leak. The air

confined within the cylinder 32 between the piston 31 and the head 35 therefore retards the movement of the cylinder 32 upon the shaft 21 after the manner of a dash-pot; and the return movement, therefore, of this cylinder will be only so rapid as the leak of the confined air past the head 35 will permit. A more rapid movement may be obtained by a suitably throttled by-pass for the air through this head 35, but as this is a simple mechanical expedient it is not thought necessary to show it in the drawings.

No attempt has been made throughout the drawings, either in those already considered or those to be considered, to show exact proportions, and it will be understood that the proportions and even the relations of the parts may be varied as may be found expedient in the installation of a structure embodying the present invention under the varying conditions that may prevail in practice.

When the phonographic annunciator is established upon a car an ordinary amplifying horn may be used, but by preference there will be small sound-directing horns located adjacent to each seat in the car, and these horns will be connected to sound-conduits arranged along the walls of the car in any suitable manner. For instance, the annunciator may be located at any convenient point and sound-conveying tubes coming from the sound-box may be located along each side of the car with the small sound-directing horns coupled up in multiple to these tubes. As this is an evident arrangement for the purpose, it is not thought necessary to show it in the drawings.

As before stated, it is not expedient to use a spring motor for the purpose of driving the mechanism heretofore described and since in the connection in which the annunciator is designed to be used air under pressure is available, and, in fact, is necessary for the operation of certain of the structures already described, we have devised a motor especially designed for driving the mechanism connected with the sound-reproducing apparatus used in our annunciator, this mechanism having a special coaction with the other parts of the device for the proper operation of these said other parts in the manner necessary for the accomplishment of the purposes we have in view. This driving mechanism is shown in Figs. 2 and 3, to which special reference is now had. In Fig. 2 there is shown a drive shaft 3 with the pinion 20 mounted thereon, and the mandrel 2 and cylindrical record 1 are also shown. The pinion 20 is engaged by a gear wheel 102 mounted on an arbor 103 which, in turn, carries a pinion 104 adjacent to the gear wheel 102. Meshing with the pinion 104 is another gear wheel 105 mounted, in turn, on an arbor 106, which latter carries a pinion 107 meshing, in turn, with a gear wheel 108 mounted for rotation upon another arbor 109 but not connected thereto except as hereinafter set forth, and the last-named shaft carries a pinion 110. Meshing with the pinion 110 there is a rack-bar 111 extending radially from one side of a shaft 112 passing at one end through a suitable support 113 fast upon a fixed portion of the machine. This shaft passes into a cylinder 114 through a suitable packing gland 115, and within the cylinder the shaft 112 carries a piston 116. Formed on one side of the cylinder 114 is the slide-valve box 117, which may be cylindrical in shape and formed originally with one end open but shown closed by means of a screw-plug 118 over which is placed a cap 119 to protect the same and prevent malicious manipulation thereof. The other end of the valve box 117 is provided with a screw-plug 120 extending both to the interior and exterior of the valve box and covered at its outer end by a cap 121. The inner end of the screw-plug 120 is provided with an axial stud 122 forming the seat for one end of a helical spring 123, which latter, at the other end, engages a piston 124, and this spring is centered on said piston by means of a stud 125. The piston 124 is fast on one end of a piston-rod 126, the other end of which is supported by a disk 127 fitting the interior of the slide-valve box 117 sufficiently tight for guiding purposes. Between the piston 124 and the disk 127 the rod 126 carries a slide-valve 128 of usual construction, and the latter is constrained to move with the rod 126 by means of collars 129 on said rod at each end of the slide-valve. The interior of the slide-valve is hollowed out, as indicated at 130, to form a passage, similar to the slide-valves found in ordinary steam engines.

The slide-valve box 117 is in communication through a passage 131 with a source of compressed air which may be the train supply coming at seventy pounds pressure, and this air supply source may be the same as that before referred to with reference to the other figures of the drawings.

That end of the slide-valve box between the inlet opening 131 and the piston 124 is in communication with the end of the cylinder 114 remote from the end through which the shaft 112 passes by means of a passage 132 opening into the cylinder 114 and communicating with the slide valve box 117 through a port 133.

The end of the slide-valve box 117 on that side of the piston 124 engaged by the spring 123 is in communication with the other end of the cylinder 114, that is, on that side of the piston 116 connected with the piston-rod 112, by means of a passageway 134, and in this passageway there is provided a throttle-valve 135, the purpose of which will hereinafter appear.

At the end of the cylinder 113 through which the piston-rod passes there is an end extension 136 in which is formed a chamber 137. The wall 138 of this chamber adjacent to the cylinder 114 is provided with a through passage formed into a valve seat in which normally rests a valve having a stem 140 supported by an upright 141 on the interior of the cylinder 114 and this stem 140 extends into the interior of the cylinder 114 for a sufficient distance to be engaged by the piston 116 when it approaches the gland end of the cylinder 114. The valve 139 has an axial extension 142 on the side opposite the stem 140 and this extension is seated in a suitable socket formed in a screw-plug 143 in the outer end wall of the chamber 137, and this screw-plug is protected by a cap 144 similar to those before mentioned. Extending from the inlet opening 131 of the slide-valve box 117 is a passage 145 leading to the chamber 137, so that the air pressure within the chamber 137 is the same as that within the slide-valve box 117.

Referring once more to the gear-train, the arbor 109 has fast thereon in addition to the gear 110 a ratchet wheel 146. Of course, the gear wheel 108 may be fast upon the arbor 109 and the ratchet 146 and pinion 110 may be formed in one piece and secured together and mounted loosely on the arbor 109. Pivotally supported on the gear wheel 108 are a number of pawls 147 arranged to engage the teeth on the ratchet wheel 146 and maintained in normal contact therewith by springs 148. Now, when the piston 116 is moved toward the gland end of the cylinder 114 in a manner to be hereinafter described, the rack 111, engaging the pinion 110, will cause the latter to rotate and the said pinion 110, being fast on the ratchet wheel 146 either directly or through the arbor 109, will impart rotation to said ratchet wheel 146. Under these conditions, the pawls 147 are in engagement with the teeth on the ratchet wheel 146, and, therefore, the gear wheel 108 participates in the movement imparted to the pinion 110 by the rack 111. As the parts are viewed in Fig. 2, the movement of the gear 108 is counter-clockwise. The rotation of the gear wheel 108 imparts motion to the other gear wheels 105 and 102 in order, and finally this motion is imparted to the shaft 3 which drives the sound reproducer and the tablet operating in conjunction therewith. When the piston 116 moves in the opposite direction, that is, away from the gland end of the cylinder 114, the rack-bar 111 rotates the pinion 110 and ratchet wheel 146 in the opposite direction but, as will be readily understood, the pawls 147 are now inactive and the gear wheel 108 and the rest of the gear train remain stationary. It may be here stated that this motive apparatus is designed to cause a sufficient number of rotations of the record cylinder 1 to reproduce all the recorded sounds thereon from one end to the other by the movement of the piston 116 on its power stroke once through the length of the cylinder 114. Now, let it be assumed that the piston 116 is in the cylinder at the end remote from the gland end. Under these circumstances, compressed air entering through the opening 131 into the interior of the slide-valve box 117, acting against the piston 124, holds the slide-valve 128 in a position to clear the port 133. The compressed air therefore enters back of the piston 116 and urges the same toward the gland end of the cylinder 114. This movement continues until ultimately the piston 116 reaches the valve stem 140 when a still further movement of the piston 116 opens the valve 139 against the air pressure in the chamber 137 and puts the said air chamber 137 in communication with the piston-rod side of the piston 116. The pressure on both sides of the piston now begins to equalize and the compressed air coming from the chamber 137 also travels through the passage 134 to the spring side of the piston 142 but because of the throttle valve 135, which may be properly adjusted for the purpose, the air pressure on the spring side of the piston 142 accumulates but slowly owing to the sluggish passage of the compressed air into the slide-valve box on the spring side of the piston 124, and the air on the piston-rod side of the piston 116 has time to come up to full pressure. Now, when the pressure in the slide-valve box on the spring side of the piston 124 has become sufficient, the said piston 124 is moved by the spring 123 to a position to close the port 133 to the air pressure and couple this port to an exhaust port 149 communicating with the external atmosphere. The air pressure on the piston-rod side of the piston 116 now returns that piston to its normal position, causing the pinion 110 and ratchet disk 146 to revolve idly. The proportions of the parts are such that by the time the piston 116 has reached its initial position at the rear of the cylinder 114 the pressure in front of it has reduced to about or very little above atmospheric pressure.

During the forward motion of the piston 116 the air in front of this piston has leaked out through the gland 115, the packing of which is purposely made somewhat loose to permit this leakage, but this leakage is too small to have any material effect when the air pressure is established in front of the piston, and the same is true with regard to the piston 124. The piston 116 has been moved rapidly to the initial position and the pressure in front of it has rapidly dropped but the pressure on the spring side of the piston 124 has not dropped rapidly because of the throttling action of the valve 135, which latter is so constructed as to be turned

to any desired position to control its throttling action. The result of this is that the piston 116 will reach its initial position before the pressure on the spring side of the piston 124 has dropped to such an extent that the pressure on the other side of this piston is able to overcome the resistance of the spring 123 and move the slide-valve sufficiently to again open the port 133 to the compressed air supply. In the meantime, and while the piston 116 is moving away from the forward position toward the rearward or initial position the drop in pressure on the front side of the piston 116 has caused the valve 139 to be seated and thus prevent any more compressed air reaching the front side of the piston from the chamber 137.

In considering the forward movement of the piston 116, whereby motion is imparted to the gear train and so to the sound-reproducing mechanism, it is to be noted that in the practical operation of the invention this motion is not continuous but intermittent, and the parts are so proportioned that one forward power stroke of the piston will occupy the time taken for the entire run of a car through the entire distance covered by the announcements contained on the record cylinder 1. Now, in order to provide for the starting and stopping of the phonographic reproducer mechanism at the proper times, we have devised the instrumentalities which we will now proceed to describe.

Secured upon the spokes of the gear wheel 105 there is an annulus 150 having on its periphery a number of spaced teeth 151 equi-distantly disposed. These teeth are formed on one side with abrupt shoulders radial to the axis of the gear wheel 105, and on the other side these teeth are approached by easy curves.

In mesh with the gear wheel 102 is a pinion 152 mounted on a shaft 153 which may be termed the governor shaft since this shaft carries an ordinary type of speed governor such as is ordinarily used in sound-reproducing machines or in other such structures. Since this governor may be of any approved type and in itself forms no part of the present invention, it has been omitted from the drawings. On the governor shaft 153 there is mounted a disk 154 against the periphery of which a suitable brake may be made to engage. In the drawings this brake is shown in the form of a pad or block 155 of suitable material, such as leather, projecting from a suitable seat in a cup 156. This cup is carried in the end of a screw 157 passing through a boss 158 formed on the end of an arm 159. A finger 160 is formed on one side of the boss 158 and serves to guide and prevent the turning of the cup 156 when adjusted to or from the disk 154 by the screw 157.

A small set-screw 161 may be used to clamp the screw 157 in its adjusted positions. The arm 159 constitutes one arm of a lever 162 pivoted at 163 to a suitable fixed portion of the framework of the machine. The lever 162 is under the control of a spring 164, the normal tendency of which is to move the brake pad 155 away from the brake disk 154, and the arm 159 is thinned so that when the brake pad 155 is in engagement with the brake disk 154 it presses against the same with a yielding or elastic pressure. The other end of the lever 162, that is, the end remote from the arm 159, carries another lever 165 by means of a pivotal screw 166. The shorter arm 167 of the lever 165 is appropriately bent and carries a roller 168 in the path of the teeth 151 on the annulus 150. The longer arm of the lever 165 is connected to the longer arm of the lever 162 by a spring 169, and a stop-screw 170, mounted on a stud 171, limits the extent of movement of the lever 165 under the action of the spring 169, while a set-screw 172 locks the stop-screw 170 in any adjusted position.

The lever 165 carries at the end remote from the arm 167 an armature 173 in operative relation to the core 174 of an electro-magnet 175. The circuit connections in which this electro-magnet is included are not shown in the drawings. It suffices to state, however, that this magnet may be in a suitably charged circuit receiving current from the power circuit on the car or from individual sources of current such as batteries, or in any suitable manner, and provision is made to close this circuit at intervals along the line of travel so that the magnet may be energized at predetermined points during the run of a car. In the normal position of the several parts the roller 168 rests against the outer end of a tooth 151 and the lever 162 is then in such position that the spring 164 is under tension and the brake pad 155 is in contact with the periphery of the brake disk 154, thus holding the latter against movement. Now, let it be supposed that a car has reached a point within a certain distance of a station and that by any suitable means the circuit of the magnet 175 has been closed so that the magnet is energized. The armature 173 is pulled over toward the magnet 175 and this causes the roller 168 to be pulled out of the radial line of the tooth with the end of which it was in engagement. The spring 164 is now free to act and pulls the lever 162 in a direction to cause the roller 168 to move toward the annulus 150 along the abrupt shoulder of the respective tooth 151. The movement of the lever 162 pulls the brake shoe or pad 155 away from the brake disk 154 and thus releases the gear train. Now, let it be assumed that the piston 116 is in its initial position and air pressure is established behind it. The gear train now being unlocked will start its movement under

the stress of the compressed air behind the piston 116. In the meantime the magnet 175 has become deënergized. The roller 168 now rides upon the periphery of the annulus 150, in which position the brake shoe or pad 155 is free from the disk 154. The movement of the gear train continues until the next tooth 151 is reached, when the easy slope of this tooth will engage the roller 168 and move the lever 162 around its pivot against the stress of the spring 164 and ultimately bring the pad or shoe 155 into contact with the disk 154 with sufficient force to stop the rotation of the gear train. When the next station or point where an announcement is to be made by the phonographic reproducer is reached the magnet 175 is again energized and the operation just described is repeated, the piston 116 advancing an appropriate distance under the action of the compressed air. And so from time to time the gear train is released whenever a predetermined point is reached, and the announcements contained on the record cylinder 1 are reproduced. The number of teeth on the annulus 150 depends on the announcements to be made, which, of course, will depend upon the conditions under which the annunciator is established; that is, there may, for example, be ten teeth on the annulus 150 and the gear carrying it may make ten revolutions during one movement of the piston 116 and one revolution of the gear wheel driven by said piston and its connections, and thus the number of announcements made may then be ten times the number of teeth 151.

The construction is such that when all the announcements to be made have been made the piston 116 will have made one full power stroke and it will then automatically return to its initial position. Because of the slow movement of the piston during its power stroke it will be seen that the air in front of it easily escapes through the packing in the gland 115 and that this packing, while loose enough for such purpose, may be sufficiently tight to prevent undue leakage when the compressed air enters the cylinder in front of the piston through the valve 139.

From the foregoing it will be seen that in a system in which our present invention is embodied all announcements are made automatically without danger of confusion; and being produced from a phonographic record and directed to points close to each passenger, these announcements will be clearly understood by each passenger on a car or train. It will also be understood that in the foregoing description we have used the terms "phonograph" and "phonographic reproducer" in the broad sense of sound reproducers and that these terms are not to have lar narrower sense as applied to any particu- the type of sound-reproducing machines.

It sometimes transpires that it is desirable to silence the reproducing parts of the annunciator without, however, stopping the action of the other parts. For instance, assume that the structure is mounted upon a sleeper. When the passengers are asleep it is desirable, of course, that they be not disturbed by the various announcements which would be made from time to time as the train passes stations, but at the same time the apparatus as a whole cannot be stopped, for, being automatic in its operation, it would get out of step. Therefore, we have devised means whereby the reproducer may be held out of operative relation with the record tablet so long as may be desired but will still be advanced along said tablet to the same extent as though the reproducer was in active operation. Then when it again becomes desirable to place the reproducer in operative relation to the tablet it will be in the proper relation thereto and continue the reproductions at the proper point, as though it had been in operative relation to the tablet during the intervening time.

Referring, now, to Fig. 12, 13 and 14, it will be seen that the arm 47 is not fast upon the cylinder 32 in the strictest sense of the word but is fast upon a collar 176 mounted upon said cylinder 32 for a very limited rotative movement about said cylinder. This independent movement, however, is not sufficient to prevent the lifting of the reproducer head from the record during the return movement to the initial position at the commencement of the record. The collar 176 has on each side short recesses 177 through which pass screws or studs 178 projecting from the cylinder 32, so that the collar 176, while confined to one plane, may move about the cylinder 32 in such plane for a very limited distance, depending upon the length of the recesses 177.

Projecting from one side of the collar 176 is a stud 179 carrying a roller 180. Upon the other side of the cylinder 32 opposite the roller 180 is a horizontal rock-shaft 181 mounted at its ends in journal bearings formed in standards 182 which may rise from the base plate supporting the entire structure. Fast upon the shaft 181 near its ends and adjacent to the journal bearings in the standards 182 are curved arms 183 bent so as to pass down under the cylinder 32 and thence up, and at the ends of these arms 183 remote from the shaft 181 they carry a track 184 in the path of the roller 180 and of sufficient length to engage said roller under conditions to be hereinafter named, during the entire length of travel of the reproducer over the record. Fast upon the shaft 181 is a depending arm 185 carrying at its free end an armature 186 in operative relation to the poles of a horseshoe electro-magnet 187, the yoke 188 of which is fast upon a post or bracket 189 secured to the base plate of the machine, which

base plate, however, is not shown in the drawings. Pivotally secured to the base of the bracket 189 is another arm 190 extending upward and suitably bent for the purpose and terminating in a head 191 formed at a short distance below its upper end with a notched off-set 192 on one side and at the extreme upper end with a supporting end and limiting finger 193. The upper end of the head 191 is shaped to receive and hold the track 184, and about midway of the length of this track it is formed with a short, depending bracket 194 carrying a pin 195 arranged to be caught by the notch of the off-set 192. The arm 190 carries an armature 196 in operative relation to another horseshoe magnet 197, the yoke 198 of which is fast upon a standard 199 which may rise from and be fast to the base plate of the machine. The arm 190 is connected to the post or standard 189 by a helical spring 200 tending at all times to draw the armature 196 away from the magnet 197.

There is provided a suitable source of current, indicated at 201, and this source may be and preferably is the prime current source of the car, which source forms a part of our complete traction system. Both magnets 187 and 197 are connected to a conductor 202 leading from one side of the current source 201. The magnet 187 is connected on its other side by a conductor 203 to one member 204 of a push-button or switch 205, the other terminal of which is connected by a conductor 206 to the other side of the current source. The magnet 197 also has the terminal remote from that connected to the current source, connected by a conductor 207 to one member 208 of a push-button or switch 209, likewise connected by the conductor 206 to the current source.

In the normal operation of the structure the track 184 is out of engagement with the roller 180 and is then supported by the engagement of the pin 195 with the notched off-set 192 of the arm 190. Under these conditions, the mechanism will operate to make the announcements audibly in the manner already described. Now, let it be supposed that it is desirable to silence the annunciator without stopping its operation or putting it out of step. For this purpose it is only necessary to complete the circuit at the push-button or switch 205, when the magnet 187 will be energized and its armature 186 will be attracted. By this means the arm 185 is drawn toward the magnet 187, thus causing the shaft 181 to rock in its bearings and the track 184 is thereby lifted until it engages the roller 180 and causes the collar 176 to be rotated about the cylinder 32 to the extent permitted by the length of the recesses 177. This movement is sufficient to lift the reproducer head 10 out of operative relation with the record tablet 1, but does not interfere in the least with the operation of the remainder of the structure, so that the reproducer head is moved from time to time the same as though it were in engagement with the record 1. It may be noted that the upper face of the track 184 is slightly beveled, so that when in engagement with the roller 180 and the latter has been lifted as described, it may engage evenly with the bearing surface of the track.

When the track 184 is lifted the pin 195 participates in the movement and thus is lifted out of the notched off-set 192 and moved upward alongside of the head 191 until the upper end thereof is reached, when, under the action of the spring 200, the arm 190 is moved to an extent to cause the head 191 to ride under the pin 195 until stopped by the tooth 193. The track is therefore locked in the elevated position, so that the push-button 205 can then be safely released to open the circuit at that point. Suppose, now, that the time period during which it is desirable to silence the annunciator has passed. The push-button or switch 209 is now manipulated to close the circuit from the current source 201 and then the magnet 197 is energized, thus drawing the armature 196 toward it and with this armature the arm 190 against the action of the spring 200. This movement of the arm 190 will draw the head 191 from under the pin 195 and thereby permit the track 184 to fall by gravity until the pin 195 is caught by the notch in the off-set 192 and the track will be held in this lowered position by said off-set. Thus, at any time desired it is possible to stop the audible action of the annunciator without interfering in the least with the continued action of the rest of the mechanism of such annunciator. Therefore, when the annunciator is again put into audible operation the announcements will begin at the proper point the same as though the audible parts of the annunciator had not been put out of action.

We claim:—

1. In an annunciator, a phonographic reproducer, a motor for driving the same, an escapement for releasing the motor to cause the phonographic reproducer to reproduce a portion only of the record, means for operating said escapement at predetermined intervals, and means independent of the driving motor for the reproducer for automatically returning the reproducer mechanism to the initial position after having completed the entire reproduction from the record tablet.

2. An annunciator comprising a phonographic reproducer, a compressed air motor therefor, a train of gear driven by the compressed air motor and in turn driving the phonographic reproducer mechanism, a toothed member actuated by said gear train, a brake mechanism controlling the gear train,

and an escapement mechanism coacting with the toothed member and the brake for releasing the motor to a predetermined limited extent of movement.

3. An annunciator comprising a phonographic reproducer, a reciprocating, compressed-air motive element, a gear train between the motive element and the phonographic reproducer mechanism, and connections between the motive element and the gear train for imparting motion thereto in one direction only.

4. An annunciator comprising a phonographic reproducer, a reciprocating, compressed-air motive element, a gear train between the motive element and the phonographic reproducer mechanism, connections between the motive element and the gear train for imparting motion thereto in one direction only, and means for automatically returning the motive element to its initial position.

5. In an annunciator, a phonographic reproducer, a gear train connected thereto, a compressed-air motive element having an active movement in one direction for impelling the gear train and an inactive movement in the other direction, means for automatically directing compressed air to cause the active movement of the motive element and inactive movement thereof in sequence, and an escapement for the gear train releasing the same to move at any one time for a portion only of the extent of travel of the power stroke of the motive element.

6. An annunciator comprising a phonographic reproducer, a gear train connected therewith, a reciprocating, compressed-air motive element, connections between the latter and the gear train active during the movement of the motive element in one direction only, automatic means for returning the motive element to its initial position under the action of compressed air, a toothed element on the gear train, a brake controlling the gear train, a spring-actuated lever carrying a brake shoe and coacting with the brake mechanism and armature lever carried by the brake lever and having a member in operative relation to the teeth on the toothed member, and an electro-magnet for controlling the armature.

7. An annunciator comprising a phonographic reproducer, a gear train connected therewith, a motive element for the gear train comprising a reciprocating member connected to the gear train during its movement in one direction and inactive to the gear train during its movement in the other direction, a spring-actuated slide-valve mechanism operating under differential air pressure to supply compressed air for the power stroke of the reciprocating member, a valve operated by the reciprocating member on the completion of its power stroke to admit compressed air to return the reciprocating member to its initial position, sluggishly acting means for destroying the differential pressure on the slide-valve operating means, and an escapement mechanism for the gear train acting intermittently thereon to cause the starting and stopping of the gear train a number of times during the power stroke of the motive element.

8. In an annunciator, a phonographic reproducer mechanism, a gear train connected to the same, a motive element for driving the gear train, a brake element connected to the gear train, a toothed member carried by the gear train, a brake lever coöperating with the brake element, an armature lever carried by the brake lever and in operative relation to the toothed member, and an armature magnet controlling the armature.

9. An annunciator comprising a phonographic reproducer, a compressed-air motor for driving the same, and means independent of the motor but under the control of compressed air for returning the reproducer sound-box to the beginning of the record tablet after having completed its extent of travel over the latter.

10. In an annunciator, a phonographic reproducer, a feed-screw and feed-nut therefor, a sound-box, a reciprocating cylinder carrying the sound-box and feed-nut, a rock-shaft carrying the cylinder, a piston on said rock-shaft and located within the cylinder, a spring tending to lift the sound-box and feed-nut out of operative relation with the record and feed-screw, respectively, automatic means for controlling the relation of the sound-box and feed-nut to the sound-record and feed-screw, respectively, and a valve mechanism under the control of the rock-shaft for admitting compressed air to the cylinder and exhausting it therefrom.

11. In an annunciator, a phonographic reproducer, and means for moving the sound-box and feed-nut into and out of operative relation with the sound-record and feed-screw, respectively, comprising a rock-shaft, a cylinder movable longitudinally thereon and constrained to rotate with said shaft, means for rocking the shaft on its axis at the beginning and end of the travel of the sound-box along the record, a piston on said rock-shaft within the cylinder, and ports controlled by the movement of the rock-shaft for admitting compressed air to the interior of the cylinder and for exhausting it therefrom.

12. In an annunciator, a phonographic reproducer, means for returning the reproducer sound-box to its initial position after having passed over the record, comprising a rock-shaft, a cylinder movable longitudinally thereon and constrained to move with said rock-shaft about the axis of the latter, means for rocking the said shaft on its axis at the

extremes of travel of the sound-box, a piston formed on the rock-shaft and housed in said cylinder, a valve head formed on one end of the rock-shaft and communicating with the cylinder through said rock-shaft to the remote side of the piston, a ported seat for the valve head for supplying compressed air to the interior of the cylinder and exhausting the same therefrom, and a bearing for the other end of the rock-shaft comprising a longitudinally movable journal in the shaft and a spring tending to maintain the valve head of the rock-shaft in its seat.

13. In an annunciator, a phonographic reproducer, means for disconnecting the sound-box and the feed-nut from the record and feed-screw, respectively, at the end of the reproduction and for returning these parts to their initial position and again placing them in operative relation, and means for controlling the sound-box and feed-nut return means consisting of an arm fast to said return means, a track in which said arm travels, another track parallel thereto for said arm, and means for moving the arm from one track to the other comprising an elevator track section, a compressed air actuating device therefor, and a valve under the control of the arm for admitting compressed air to the elevator control means after the arm has passed thereon.

14. In an annunciator, a phonographic reproducer, a rock-shaft, a cylinder movable longitudinally thereon and constrained to move with said rock shaft about its axis, connections between said cylinder and the sound-box and feed-nut of the phonographic reproducer, means for admitting compressed air to cause the cylinder to move longitudinally on said shaft in a direction to return the sound-box and feed-nut to their initial positions, an arm on said cylinder, parallel tracks for said arm, means for moving said arm from one track to the other to lift the sound box and feed-nut out of operative relation to the sound-record and feed-screw respectively, a member for moving the arm from one track to the other, a valve in the path of the arm and moving on the track in a direction to return the phonographic members to their initial positions, and a compressed-air motive element under the control of said valve for moving the arm from the track in the path of which the valve is located to the other track and at the same time rocking the shaft to bring the reproducer sound-box and feed-nut into operative relation with the sound-record and feed-screw, respectively.

15. In an annunciator, a phonographic reproducer, means for driving the same, an escapement for releasing the driving means to cause the phonographic reproducer to reproduce a portion only of the record, means for operating the said escapement at predetermined intervals, and means for moving the sound reproducing portions of the mechanism out of action and for returning them into action without affecting the progressive operation of the other portions of the mechanism.

16. In an annunciator, a phonographic reproducer, means for driving the same, an escapement for releasing the driving means to cause the phonographic reproducer to reproduce a portion only of the record, means for operating the said escapement at predetermined intervals, means for automatically returning the reproducer mechanism to the initial position after having reached the end of the record tablet, and means for moving the reproducer out of operative relation with the record and for returning it into operative relation with the record without affecting the progressive operation of the remainder of the mechanism.

17. An annunciator comprising a phonographic reproducer, a motor for actuating the reproducer mechanism, an escapement for the motor intermittently actuated and constructed to permit the reproduction of a portion only of the record at each action of the escapement mechanism, means for moving the reproducer head out of operative relation with the record without disturbing the action of the rest of the mechanism, and means controlled from a distance for effecting such movement of the reproducer head.

18. In an annunciator, a phonographic reproducer, means for setting the same into operation intermittently, and electrically controlled means for moving the reproducer head out of and into active operation without affecting the progressive operation of the remainder of the mechanism.

19. In an annunciator, a phonographic reproducer, means for intermittently actuating the same to reproduce a portion only of the record at any one time, and means for moving the reproducer head into and out of operative relation with the record without affecting the progressive operation of the reproducer actuating mechanism comprising a mounting for the reproducer head having a limited free movement, a track for supporting the reproducer mounting in the inactive position, a lock for holding said track to maintain the reproducer in the inactive position, and electro-magnetic means for actuating the track and lock.

20. In an annunciator, a phonographic reproducer, means for intermittently actuating the same to reproduce a portion only of the record at any one time, and means for moving the reproducer head into and out of operative relation with the record comprising a mounting for the reproducer head having a limited free movement, a track for supporting the reproducer mounting in the inactive position, a lock for holding said track to

maintain the reproducer in the inactive position, electro-magnetic means for moving the track into engagement with the reproducer mounting to move the said reproducer out of action, electro-magnetic means for operating the lock for the track, and electric circuits controlled from a distance and including the said electro-magnetic operating means.

In testimony that we claim the foregoing as our own, we have hereto affixed our signatures in the presence of two witnesses.

WILLIAM C. MAYO.
JOHN HOULEHAN.

Witnesses:
W. A. WARNOCK,
JOHN L. SPADER.