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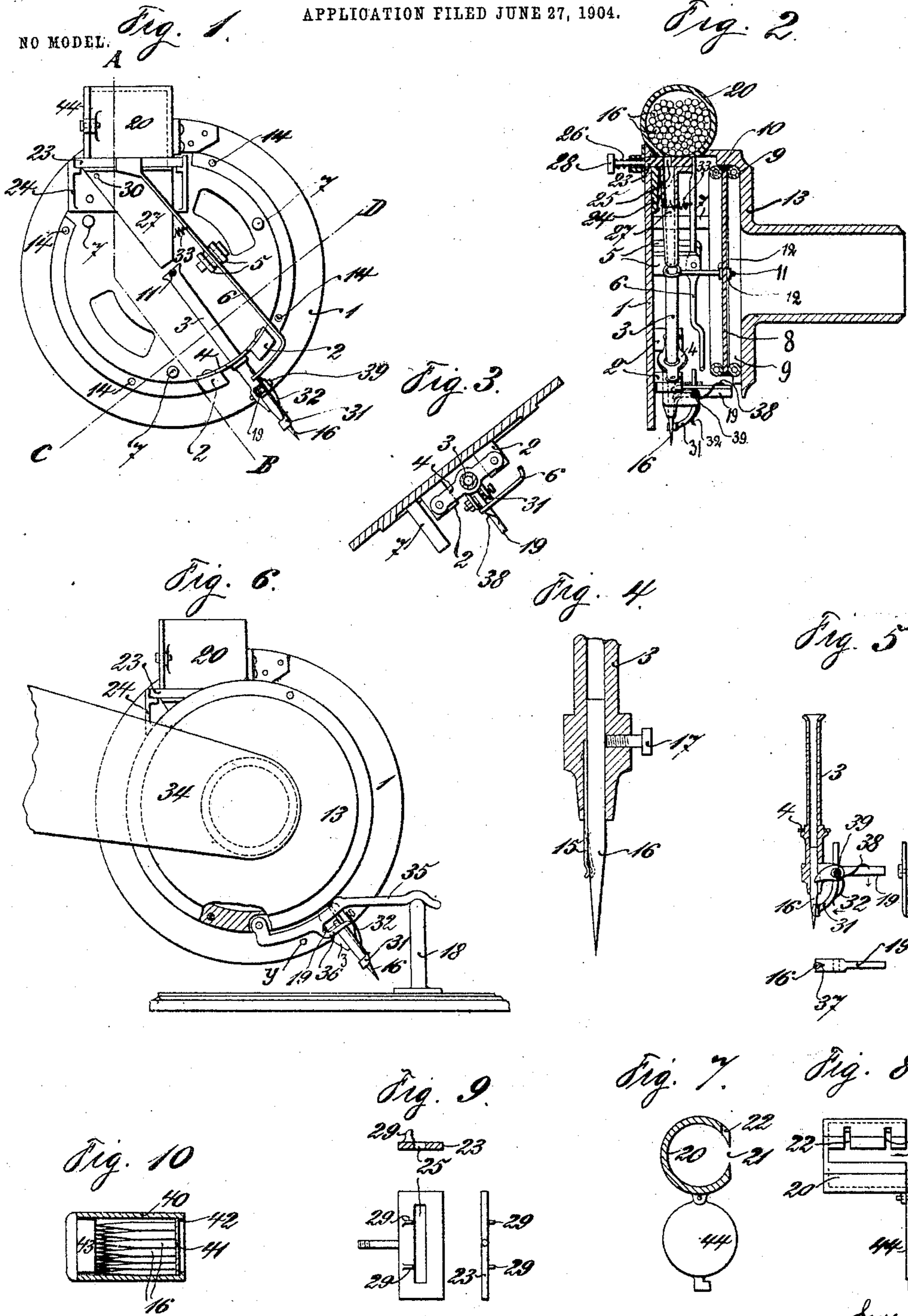
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I. SCHMURKIN.

MECHANISM FOR CHANGING THE REPRODUCER PINS OF SOUND
REPRODUCING APPARATUS.

APPLICATION FILED JUNE 27, 1904.

NO MODEL.



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MECHANISM FOR CHANGING THE REPRODUCER-PINS OF SOUND-REPRODUCING APPARATUS.

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To all whom it may concern:

Be it known that I, IWAN SCHMURKIN, a subject of the Czar of Russia, residing at Moscow, Russia, have invented certain new and useful
 5 Improvements in Mechanism for Changing the Reproducer-Pins of Sound-Reproducing Apparatus; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled
 10 in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to characters of reference marked thereon, which form a part of this specification.

15 In sound-reproducing apparatus having sound-plates—such as the gramophone, zono-
 phone, graphophone—as is well known, it is necessary to insert a fresh pin in the pin-
 20 holder of the reproducer after each time of playing for the purpose of preventing the rapid destruction of the extremely-fine sound-reproducing corrugations of the plates.

Now this invention relates to mechanism which is designed to partly replace the opera-
 25 tion of the hand in changing the reproducing-pin by producing automatically the changing and fixing of said pin in the pin-holder when pressing on a knob.

In the accompanying drawings, which illus-
 30 trate a reproducer provided with an example of the improved mechanism, Figure 1 is an inside view of the reproducer-lid, on which is fixed the pin-holder, and also the entire chang-
 ing mechanism. Fig. 2 is a section on the
 35 line A B of Fig. 1, showing the entire reproducer. Fig. 3 is a section on the line C D of Fig. 1. Fig. 4 shows, at an enlarged scale, the section of the lower part of a pin-holder
 40 as used with this invention. Fig. 5 is a section showing the modified pin-holder represented on Figs. 1 to 3 with its appurtenant parts. Fig. 6 is a general view of the reproducer in
 45 the position of rest in which the automatic changing of the pin is effected. Figs. 7 and 8 are respectively a cross-section and an eleva-
 tion of the pin-magazine. Fig. 9 represents detailed views of the slide hereinafter referred to. Fig. 10 shows the box for packing the
 50 pins for the purpose of facilitating the charging of the pin or needle magazine.

The lid 1 is provided on its inner side with projections 2 for the attachment of the pin or needle holder 3 in the ordinary way by means of a thin disk 4. The lid 1 is also provided with projections 5 for the axle of a lever 6 55 and with three or more supports 7. On the latter there is fixed a flat metal ring (not shown) for the purpose of clamping the diaphragm 8 in the usual manner between two rubber rings 9 and 10. The diaphragm is either stuck on 60 the stud 11 of the pin-holder 3 or is fixed thereon—for instance, by means of the nuts 12, Fig. 2. The lid 1 itself is fixed on the reproducer-casing 13 by means of screws inserted through the apertures 14. 65

The needle-holder 3, Figs. 4 and 5, consists of a small tube open at both ends and wide enough to allow a reproducing-pin to slide through freely. On the lower end of this small tube there is mounted a pin-catching de- 70 vice—such as, for instance, a small flat spring 15, Fig. 4, or the like—which prevents the pin 16, which is inserted with its point directed forward through the other end, from falling out and also retains the said pin in its 75 operative position—that is to say, in the position suitable for playing. The fixing of the pin is then effected either by means of the ordinary set-screw 17 or automatically on lift-
 80 ing the reproducer, &c., off the supporting-bracket 18, Fig. 6, by means of the spring-pressed clamping-lever 19, as hereinafter described.

For the purpose of inserting the pins 16 singly with their points directed forward into 85 the pin-holder 3 the following device is employed: On the lid of the reproducer there is attached a cylinder 20, Figs. 7 and 8, which is open at one end and is provided with a longitudinal slot 21 and transverse slots 22. 90 This cylinder is fixed with the slot 21 turned downward, Figs. 1, 2, and 6, in a horizontal or approximately horizontal position. The slide 23, which is capable of sliding in the frame 24, is arranged directly below the cyl- 95 inder 20 and has a recess 25, Fig. 9. This slide in its forward end position, Fig. 2, which is determined by the elasticity of the spring 26, closes entirely the slot 21 of the cylinder, and the recess 25 in the slide is situated over 100

the flat funnel 27, which is open at the top and whose narrow exit-aperture is arranged directly over the preferably funnel-shaped enlarged upper end of the pin-holder 3. The pins 16 are pushed into the magazine 20 with their points in front, and they remain in this position in spite of unavoidable shocks, &c., because the inside diameter of the magazine, is smaller than the length of the pins. On pressing on the knob 28 of the slide 23, Fig. 2, in order to force the latter as far as possible into the reproducer-casing the recess 25 comes under the slot 21 of the magazine, through which a pin can readily fall out. In order to insure that the pins shall pass out of the magazine into the recess 25 in the slide even when they may have assumed an oblique position in the magazine, the slide is provided with projections 29, Fig. 9, which extend into the slots 22 of the magazine and which will always guide the pin situated directly in front of them with certainty in the correct position relatively to the slot 21. As only one pin at a time can find room in the slot 25, then as soon as the slide 23 is released and has been moved back by the action of the spring 26 only one needle at a time will be moved in a horizontal position into the funnel 27; but since the heavier thick end of the pin will come at once against the inclined side wall of the funnel or against a stop—for instance, the stud 30, Fig. 1—provided specially for this purpose the pin will turn inside the funnel with its point downward and will pass in this position into the pin-holder 3. A flat spring 15 or the like on the lower end of the pin-holder will allow the pin to project only to about half its length—that is to say, with its pointed conical portion from the pin-holder. The pin can then be fixed by means of the usual set-screw.

In the apparatus just described the pin after playing must be removed by hand after the set-screw has been loosened. In order to obviate this, there may be employed a suitably-formed small lever 31, Figs. 5, 1, 2, and 3, which is mounted on the pin-holder for the purpose of catching the pin inserted in the pin-holder in the correct position. This lever is held by the spring 32 in its operative position, and when the slide 23 is pushed into the reproducer it is moved away from the pin by means of the lever 6, that is mounted in the supports 5. If then the slide with the fresh pin in its recess moves back into its position of rest, the lever 6 will be caused by the spring 33, Figs. 1 and 2, to rock in the opposite direction, and thus entirely release the lever 31, so that the pin which is now introduced is caught by it again in the position suitable for playing. For the purpose of obviating also the necessity for fixing the needle by hand in the pin-holder there may be employed, according to this invention, a

spring-pressed clamping-lever 19, Fig. 5. During the operation of changing the pin this lever is held in a position in which the pin sliding down in the pin-holder can pass freely past the said lever. This holding of the lever 19 is effected by placing the reproducer, with the sound-tube 34, Fig. 6, upon the supporting-bracket 18 by means of the arm 35, Fig. 6, which is mounted on the part 13 of the reproducer-casing, whereby the hook 36 of the lever-arm 35 raises the long arm of the clamping-lever 19, and thus turns back the short arm of the latter, which is conveniently provided with a recess 37 in its end. When the reproducer is lifted off the supporting-bracket 18, the arm 35 releases the clamping-lever 19 and is kept entirely out of contact therewith by means of a suitable stud y , provided on the casing of the reproducer. The weak spring 38 then presses the lever 19 against the pin 16, Fig. 5, with a force which is sufficient to produce a clamping of the pin in the pin-holder as soon as the point of the pin is placed upon the sound-plate for the purpose of playing. The greater the weight (the weight of the reproducer, sound-tube, &c.) resting on the pin—that is to say, the greater the force which has a tendency to push the pin into the pin-holder—the more firmly will the pin be clamped in its place and position, because the point of contact between the pin and the lever 19 is situated on a somewhat lower level than the axle 39 of the latter, upon which axle also the catch-lever 31 is loosely mounted. In the new apparatus constructed in this manner it is merely necessary to place the reproducer, &c., upon the supporting-bracket 18, as shown in Fig. 6, in order to release the worn reproducer pin or needle, so that by pressing on the knob 28 of the slide and releasing the same an automatic changing of the reproducing-pin is effected. As during the playing neither the lever 6 is touching the catch-lever 31 nor the arm 35 is touching the clamping-lever 19, the pin-holder 3, which is fixed to the small elastic steel plate 4, can vibrate with complete freedom, as in all other reproducers.

In order to be able to readily fill the magazine 20 with reproducing-pins, it is advisable to pack such pins in cylindrical boxes 40, Fig. 10, of such diameter as will allow of pushing said boxes into the magazine. These boxes have a bottom 41 resting loose on the beading or flange 42. They are closed at the other end by means of a plug of metal or wood 43 or the like. The points of the pins 16 are arranged facing the plug, and the charging of the magazine is effected (after having first removed the plug 43) by pushing the box, with its open end foremost, partly into the magazine and then knocking the bottom 41 into the box by means of a plunger or the like, and thus pushing the pins out

of the box and into the magazine, the latter being then closed by the lid 44 after the box 18 has been removed.

What I claim is—

5 1. In mechanism for changing the reproducing-pins of sound-reproducing apparatus having sound-plates, in combination with the reproducer, an approximately horizontal cylinder for containing reproducing-pins, attached
10 to the reproducer and formed with a longitudinal slot, a slide, a flat funnel, a tubular pin-holder and a spring device whereby the reproducing-pins contained in the said cylinder pass singly through the said longitudinal slot
15 into the said slide by which they are transferred into the said flat funnel from which the said pins slide point foremost into the said pin-holder at the lower end of which they are caught and fixed in the operative position
20 by the said spring device, substantially as set forth.

2. In mechanism for changing the reproducing-pins of sound-reproducing apparatus having sound-plates, in combination with the reproducer, an approximately horizontal cylinder for containing reproducing-pins, attached to the reproducer and formed with a longitudinal slot, a slide, a flat funnel, a tubular pin-holder, a spring-pressed catch-lever
25 mounted on the said pin-holder, and a releasing-lever, whereby the said catch-lever is raised off the pin to be changed by the said slide by means of said releasing-lever, so soon as the said slide is pushed out of the magazine
30 for the purpose of transferring a fresh pin into the pin-holder, substantially as set forth.

3. In mechanism for changing the reproducing-pins of sound-reproducing apparatus having sound-plates, in combination with the reproducer, an approximately horizontal cylinder for containing reproducing-pins, attached to the reproducer and formed with a longitudinal slot, a slide, a flat funnel, a tubular pin-holder, a spring-pressed catch-lever
40 mounted on the said pin-holder, a releasing-lever, a spring-pressed pin-holding lever mounted on the pin-holder, a supporting-bracket, and a supporting-arm whereby the said pin-holding lever is turned aside during
50 the changing of the needle, by placing the reproducer with the sound-tube on the said supporting-bracket by means of said supporting-arm, substantially as set forth.

4. In mechanism for changing the reproducing-pins of sound-reproducing apparatus having sound-plates, in combination with the reproducer, a pin-magazine, and a box having a movable bottom whereby the pin-magazine can be readily charged with pins by pushing
60 the bottom to move the pins into the magazine, substantially as set forth.

5. In mechanism for changing the reproducing-pins of sound-reproducing apparatus, the combination with a magazine and a pin-holding element, of pivoted means to catch the pin

at the end of the element and means to deliver pins one at a time to said element, substantially as described.

6. In mechanism for changing the reproducing-pins of sound-reproducing apparatus, the combination with a magazine and a pin-holding element, of a lever to catch the pins at the end of the element, means to deliver pins one at a time to the pin-holding element and mechanism operated by said means to operate the catching-lever to release that pin at the end of the element, substantially as described.

7. In mechanism for changing the reproducing-pins of sound-reproducing apparatus, the combination with a magazine and a pin-holding tube, of means to catch the pins at the end of the tube, means to transfer pins one at a time from the magazine to the tube and a pin-securing device at the end of the tube, substantially as described.

8. In mechanism for changing the reproducing-pins of sound-reproducing apparatus, the combination with a magazine and a pin-holding element, of a device to catch the pins at the end of the element, means to transfer pins, one at a time, from the magazine to the pin-holding element, mechanism operated by the means to transfer the pins from the magazine to actuate the catching device to release that pin in the end of the element, and a pin-securing device to secure the pin after being caught, substantially as described.

9. In mechanism for changing the reproducing-pins of sound-reproducing apparatus, the combination with a magazine and a pin-holding tube, of a slide to deliver pins one at a time from the magazine to the tube, a catching-lever at the end of the tube, means to release the latter and operated by the slide, and a spring-held pin-securing lever, substantially as described.

10. In mechanism for changing the reproducing-pins of sound-reproducing apparatus, the combination with a magazine having a longitudinal opening beneath and transverse slots 22, of a slide beneath the opening and having a slot to receive a single pin, lugs on the slide proximate the slot and adapted to enter the slots 22 to aline the pins in the magazine during the movement of the slide, and a guide-receptacle into which the slide delivers the pin, substantially as described.

11. In mechanism for changing the reproducing-pins of sound-reproducing apparatus, the combination with a cylindrical magazine having a longitudinal delivery-slot and transverse slots 22, of a spring-retracted slide having a slot to receive a single pin, lugs on the slide to enter slots 22 and aline pins in the magazine, a guide-receptacle to receive the pins from the slide and means to cause the pins to fall point down in said receptacle, substantially as described.

12. In mechanism for changing the reproducing-pins of sound-reproducing apparatus,

the combination with a magazine, of a guide-
receptacle, a slide between the receptacle and
magazine to deliver pins one at a time from
the latter to the former, a stud in the recep-
5 tacle and path of the pin to cause it to fall
point down, and means below the receptacle
to hold the pin, substantially as described.

In testimony that I claim the foregoing as
my invention I have signed my name in pres-
ence of two subscribing witnesses.

IWAN SCHMURKIN.

Witnesses:

IWAN ALEXEIEFF,
GUSTAV T. HARTING.