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COMPLETE SPECIFICATION

A Combined Toy Cinematograph and Sound Producing Apparatus

I, RAIMUNDO PAYA RICO, a Spanish Citizen, of Ibi (Alicante), Spain, do hereby declare the nature of this invention and in what manner the same is to be performed to be particularly described and ascertained in and by the following statement:—

Although a variety of toy cinematograph apparatus, for use by children are known, none incorporates the combined action of projecting images with synchronised accompaniment of sound or musical audition. The object of the apparatus hereinafter described is to fulfil this purpose, the description being given with reference to the accompanying drawings in which:—

Figure 1 is an elevation of the apparatus with the front cover removed, and other parts left out.

Figure 2 is an elevation with the front cover in place, showing part of the mechanism carried in front of the cover.

Figure 3 is a part side elevation of the apparatus with side casing removed to expose interior, drawn on a smaller scale, and showing all the mechanism already illustrated in the previous figures.

Figure 3a is a detail view of spool releasing mechanism in open and closed position, seen from beneath.

Figure 4 is a part sectional plan of the apparatus on line 4—4 of Figure 3, certain parts being omitted from the view.

Figure 5 shows a strip carrying a dual row of pictures and the sound accompaniment represented by apertures formed in the strip.

Referring to Figures 1 to 4 of the drawings, the crank handle 1 of Figure 1 is turned by hand, and transmits its movement to the lever 4 through the crankshaft 3 and levers 28 and 29. The lever 4 oscillates vertically and actuates the bellows 5 which supply air into the storage chamber 11. For this purpose, the bellows are connected to the lower end of lever 4 by a bracket 6. A plate 4a having a slot 7 into which projects the extremity 8 of the lever 12 (see Figure 2), is carried by the lower extremity of lever 4 and moves with it.

The lamp which supplies the illumination is shown at 9, and 10 is the casing which directs the light on the film.

In Figure 2 the plate 4a on the lever 4 is shown in engagement with the oscillating lever 12, the latter being illustrated in two positions 12a and 12b is adapted to control the movement of the sliding shutter 13 to which it is connected, by means of its extremity engaging an eye 13a in the lower extension 13b. The shutter has two window apertures 14 and 15 which register alternately with the fixed apertures 14a and 15a for the two rows of pictures shown in Figure 5. The shutter carries two prismatic lenses 26 and 27 (Figure 3) which bring the light rays from both window apertures 14 and 15 into line with the axis which passes through the centre of the objective 37, so that the latter projects the pictures on both rows on the film, alternately on the screen, and a continuous motion of pictures on the screen, ensues by reason of the vertical oscillation.

The shuttering effect is performed through the up and down oscillating movement which is limited by the buffer or stop 16 which projects through the slot or opening 17 in the lower end 13b of the sliding shutter 13 (See Figure 2).

The spool 20 which is controlled by knob 18, receives the film strip after the latter has moved across the objective and air apertures 19. The supports 21 and 22 engage the ends of the removable supply film spool (not shown). 23 represents the support for the releasable winding mechanism which connects the gear wheel 24 on the lower end of spool 20 with the endless screw 2 disposed on the crankshaft 3. By swinging the plate 23a along the slot 23b through which the spool spindle which carries the gear 24 passes, the gear is moved out of engagement with the endless screw 2 (See Figure 3a).

Figure 3 shows the housing 25 for the shutter carrying the two prismatic lenses 26 and 27 with the aid of which the apertures 14 and 15 are made to coincide with the axis of the objective 37. Both prismatic lenses oscillate in a vertical plane under the action of the lever 12 which is itself actuated by lever 4.

30 is the lamp support and 31 the reflector. The bellows 5 comprise sections a and b. 32 refers to two valves of known type, one of which controls the admission of air and the other its transmission to storage chamber 11. 33 shows two further valves which operate in a similar manner for section b of the bellows. These are shown more or less diagrammatically in Figure 3 and are seen more particularly in Figure 4. The wall 34 forms one side of expansion chamber 11; with which is connected a kind of bellows 39, a compression spring 35 being provided between movable wall 38 and the outer casing to control the air pressure in chamber 11. 36 is a release valve, and 37 is the objective of the apparatus.

Referring more particularly to Figure 4 the wall 38 moves to and fro according to the pressure of the air stored up in chamber 11. The stem 40 which is connected to the valve 36 acts as a buffer, so that when the amount of air stored in chamber 11 has reached its maximum volume, the wall 38 through which the stem 40 projects as moved outwardly to its fullest extent and the buffer comes in contact with the outer casing and causes the outlet valve 36 to open.

43 shows the sound unit which is provided with air ducts or slots 19 and reeds 42, the air slots corresponding with the air apertures in the band or film (Figures 2 and 4).

In Figure 4 are shown eight circular openings c. Those situated inside chamber 11 correspond to the outlet valves 32 and 33 from the bellows 5 and those outside the chamber to the air supply valves to the bellows. These eight non-return flap valves which are of known construction are indicated in Figures 3 and 4 by the numerals 32 and 33.

Figure 5 shows a portion of the strip on which the pictures are represented in two rows, with the same pictures in each row but in different positions. The optical arrangement of the apparatus produces the impression of continuity of both positions; in other words, the apparatus is provided with the necessary optical contrivance to enable the various pictures to appear in constant motion.

By reason of the duplication of the pictures and of the general construction of the apparatus, a show of approximately three minutes duration can be obtained with a strip of film 40 inches long, whereas in other types of projection apparatus, from ten to twelve times the length of film is required for a show of similar duration.

The film strip may be of any suitable substance and projects moving pictures

with simultaneous sound accompaniment. The said strip or film is characterised by the provision of a single member from which is obtained a musical audition synchronised with phases of a moving picture.

In order to obtain this result the pictures are arranged along one or both longitudinal edges of the strip according to the disposition and construction of the objective used. The remainder of the strip is used for the sound record, and is formed with a plurality of apertured holes of square or other geometrical shape, through which air can pass when these coincide with the air apertures 19 in the sound unit 43, to produce the desired musical sound.

The apertured holes of the film strip which may be referred to as the music strip since it controls the sound from the sound unit when air is drawn against the reeds, can be cut by hand or by mechanical means.

The strip can be made of paper, celluloid, linen or any other suitable material. The sound unit may be produced by any known process, and adapted to the particular construction of the apparatus.

The apparatus according to this invention operates as follows:

The spool carrying the strip illustrated in Figure 5 is secured between the guide pins 21 and 22, and the film is passed in front of the air slots 19 then through the space 37a between the objective and the casing, to spool 20 and rolled up thereon. The incandescent lamp 9 is connected to a source of current and the handle 1 set in rotary motion to bring the levers 4, 28 and 29 in action. This movement has the following result:

(1) The bellows a and b indicated at 5 (Figure 3) are actuated. The bellows draw air and in turn drive it into chamber 11, in which the amount and pressure is regulated by the oscillating wall 38 and spring 35. When the buffer 40 comes in contact with the casing wall the valve 36 is caused to open to release surplus air and regulate the pressure and volume of air in the said chamber. The air stored up in chamber 11 passes through the air slots 19 and causes the reeds 42 of the sound unit to vibrate and produce a musical sound or sounds when the openings in the sound film coincide with those in the sound unit.

(2) A further result is the oscillation of lever 12 (Figure 2) between positions 12a and 12b as shown in the said figure. This lever in turn controls the vertical oscillations of the sliding shutter 13 which is provided with two windows 14 and 15, whose position changes according to the 130

position 12a and 12b of lever 12. The light ray from the lamp 9 passes through these windows 14 and 15 which correspond to each phase of one of the two rows of pictures of the strip. The ray of light which projects through the strip and the window aperture passes through the prismatic lenses 26 and 27 which are situated in the housing 25 and whose purpose has already been explained in the description, namely, to effect the corresponding displacement of the light rays, so that the light passing through the apertures 14 and 15 coincide with the axis which passes through the centre of the objective 37, and effects alternately the projection of the pictures of both rows of the strip on the screen. By means of the prismatic lenses the shutter can be worked in such a way that an animated picture can be projected on the screen without light and shadow oscillation. This is made possible by the sliding shutter which when it covers the aperture 15a, leaves the aperture 14a clear, and similarly to the same extent when for the time being the other is uncovered so that the pictures appear in aperture 14a for the same proportion of time as they appear in aperture 15a. As a result the projected picture does not disappear from the screen as long as the projection lasts.

(3) A third result of the above mentioned motion consists in the moving of the strip which is fed from a spool which has been introduced between the guide pins 21 and 22 (Figure 2). Spool 20 is so moved that the pictures draw past in front of the ray of light, and the apertures in the strip are positioned before the sound unit.

In order to rewind the film again on to its original spool, the winding gear 24 on spool 20 shown in detail in Figure 3a is disconnected from the endless screw 2 and handle 1, and the supply film spool is rotated by means of member 21.

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

1. A combined toy cinematograph and sound producing apparatus comprising a picture projector and a pneumatic device adapted to co-operate with apertures in a moving strip or film in order to produce musical sounds, said strip or film also carrying pictures adapted to be projected by said picture projector.

2. A combined toy cinematograph and sound producing apparatus as claimed in Claim 1 wherein the picture projector, sound apparatus and film are controlled and operated simultaneously by the rota-

tion of a handle.

3. A combined toy cinematograph and sound producing apparatus as claimed in claim 1 or claim 2 wherein the projector comprises a single source of illumination, and an oscillating shutter carrying a pair of prismatic lenses to project alternate pictures from two separate rows on the strip or film.

4. A combined toy cinematograph and sound producing apparatus as claimed in claim 3 in which the shutter has a pair of apertures working in conjunction with another pair of apertures in the projector, and the prismatic lenses are adapted to bring rays of light from these apertures when they coincide, into line with the axis of the objective to ensure that the alternate projection be effected to give a continuous motion effect.

5. A combined toy cinematograph and sound producing apparatus as claimed in the preceding claim in which the rotary handle is connected with the oscillating shutters through a set of levers, which at the same time operate bellows for supplying air for the sound apparatus.

6. A combined toy cinematograph and sound producing apparatus as claimed in claim 5 comprising an air storage chamber which is provided with a movable wall and a regulating valve for preventing the pressure of air in the said chamber from exceeding a predetermined value.

7. A combined toy cinematograph and sound producing apparatus as claimed in any of the preceding claims wherein the film strip is unwound in a horizontal plane and passes between the pair of stationary apertures and the source of illumination and the window apertures in the shutter change their positions alternately and simultaneously with a change of position of two prismatic lenses behind a fixed objective.

8. A combined toy cinematograph and sound producing apparatus as claimed in claim 7 in which the apertures in the sound film are brought simultaneously in engagement with those in the pneumatic device, and the strip is finally rolled up on a carrying spool.

9. A combined toy cinematograph and sound producing apparatus as claimed in Claim 8 in which the carrying spool is carried on a movable support and is driven by the rotary handle through a worm and pinion mechanism, the pinion being mounted on the extremity of the spool, and the movable support being adapted to cause a disengagement between the worm and pinion to release the drive and permit the unwinding of the spool.

10. A film or strip for use with a combined toy cinematograph and sound pro-

ducing apparatus as claimed in any of the preceding claims having printed or engraved thereon two rows of pictures to provide an animated projection and apertures for the production of sound from a pneumatic device.

11. A combined toy cinematograph and sound producing apparatus comprising a picture projector and a pneumatic device

adapted to co-operate with apertures in a moving picture strip or film, to produce musical sounds substantially as described with reference to the accompanying drawings.

Dated this 9th day of May, 1935.

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Fig. 1

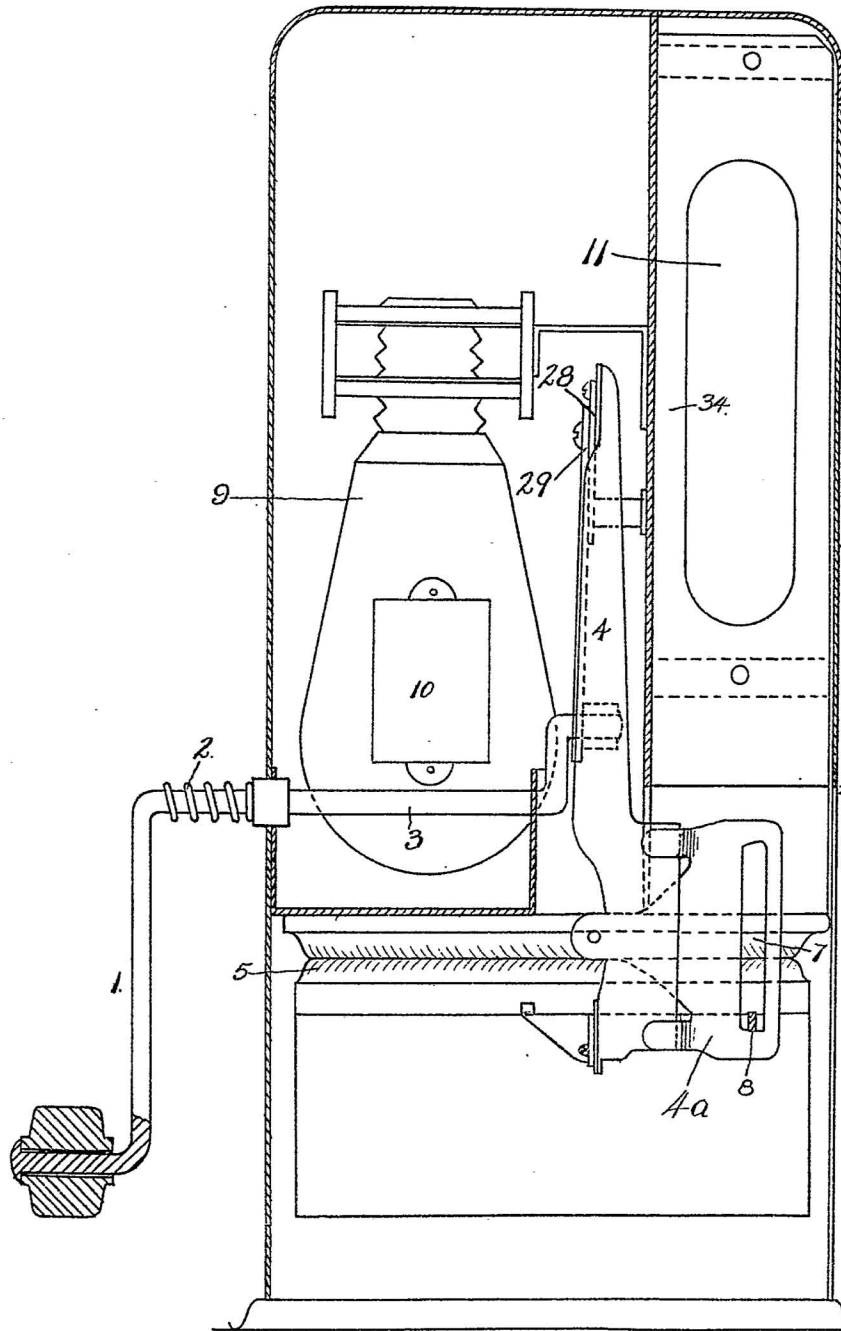


Fig. 2

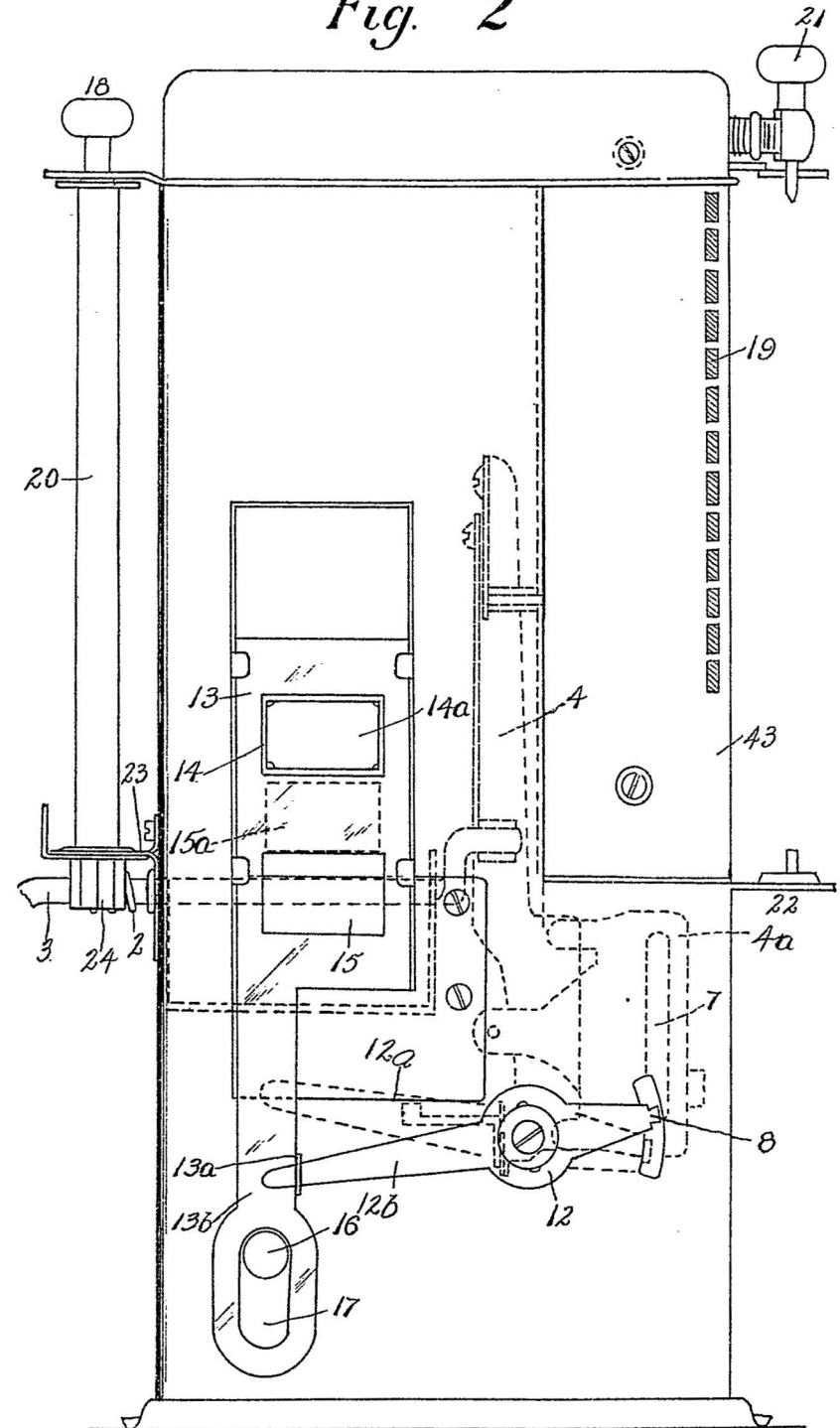


Fig. 3

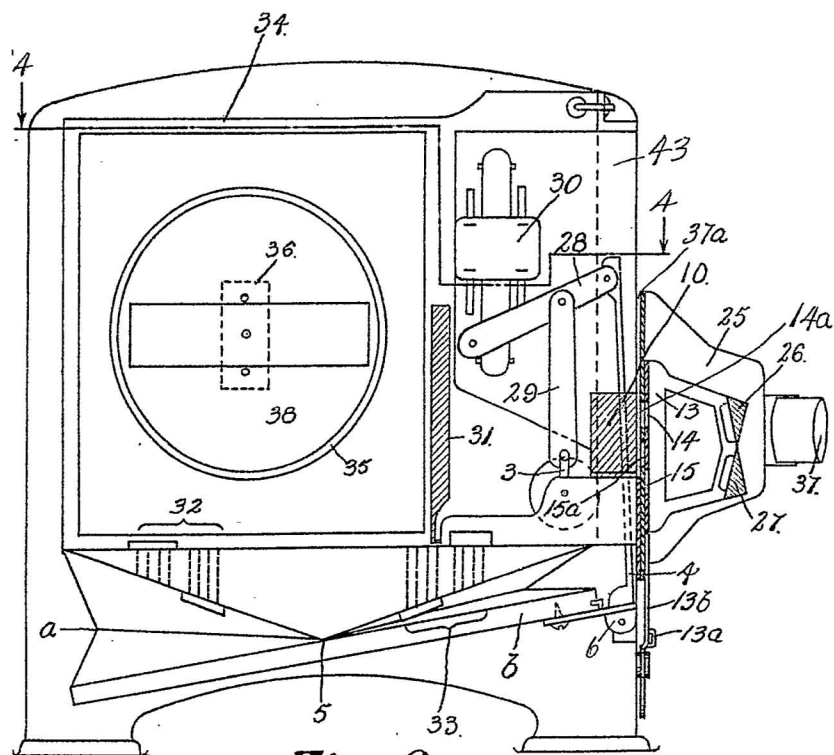


Fig. 3a.

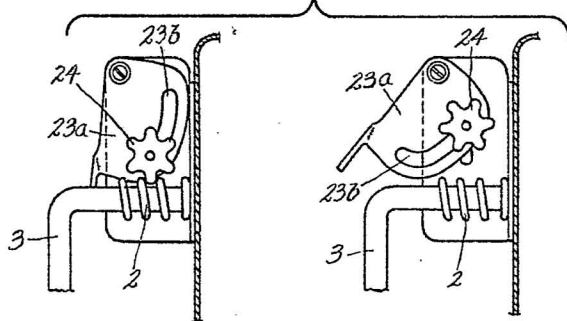
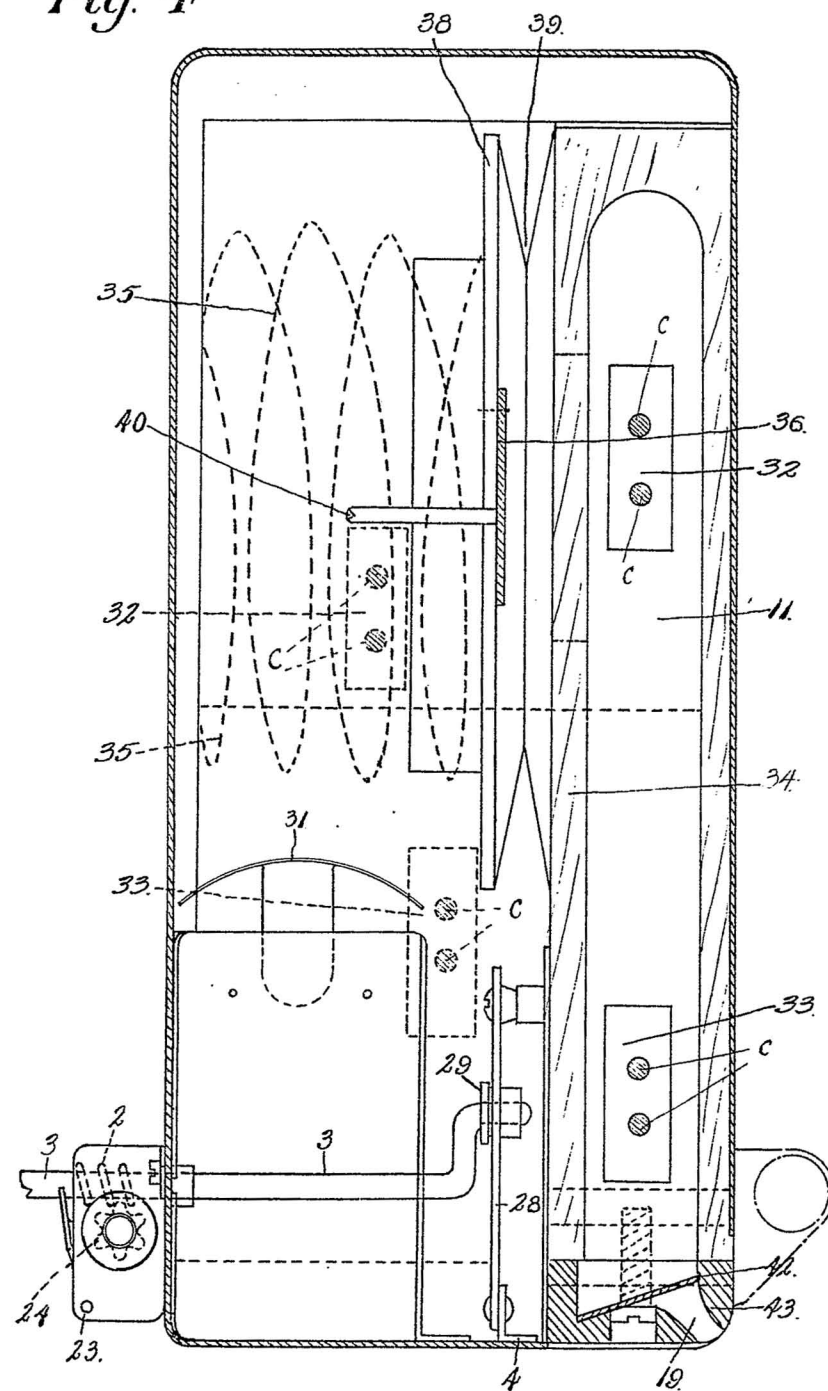


Fig. 4



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

Fig. 5

