Feb. 17, 1925.

1,526,494

C. J. HENSCHEL

ANNUNCIATOR DROP

Filed April 12, 1920

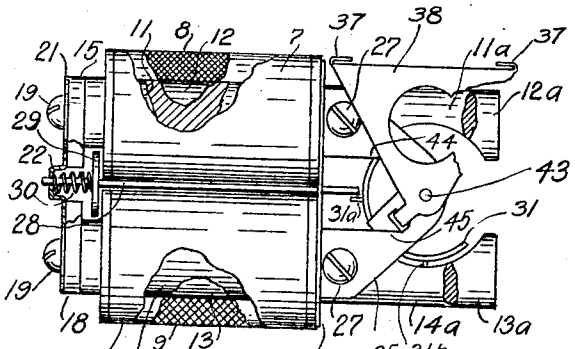


Fig 1

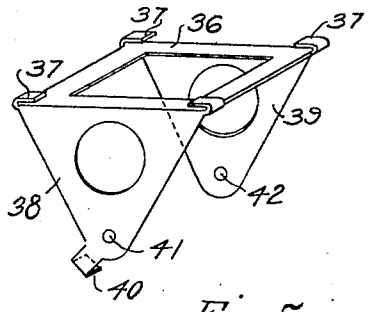


Fig 5

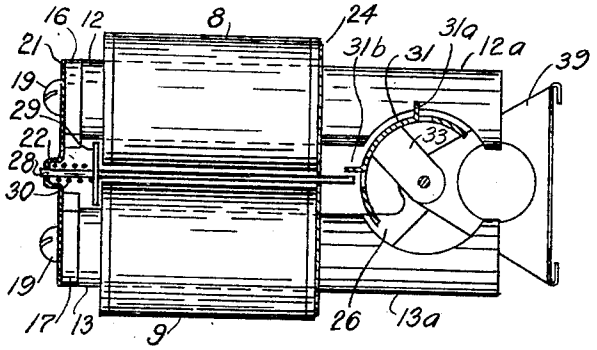


Fig. 2

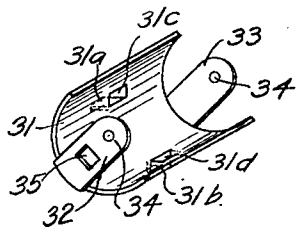


Fig 4

Fig. 6.

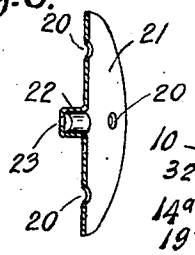
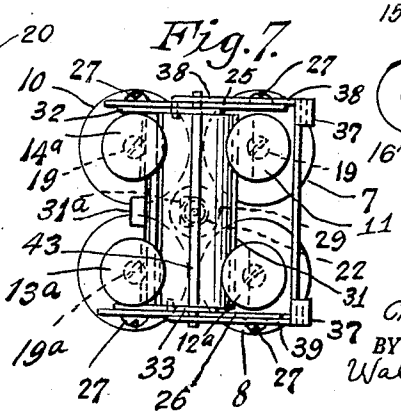


Fig. 7.



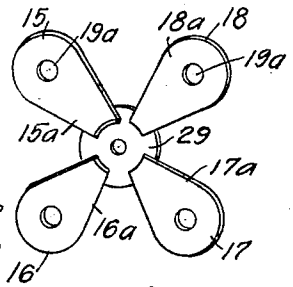


Fig 3

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# UNITED STATES PATENT OFFICE.

CHARLES J. HENSCHEL, OF BROOKLYN, NEW YORK.

## ANNUNCIATOR DROP.

Application filed April 12, 1920. Serial No. 373,418.

*To all whom it may concern:*

Be it known that I, CHARLES J. HENSCHEL, a citizen of the United States, residing at Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Annunciator Drops, of which the following is a full, clear, and concise description.

My invention relates to annunciator drops of a type suitable for use upon shipboard and in many other relations where the conditions are very exacting, and especially where the annunciator drop is likely to be subjected to the action of exceptionally heavy vibrations, shocks and jars, such, for instance, as are incidental to modern gunfire.

More particularly stated, I seek to so construct the shutter drop and arrange the parts thereof that the shutter is always locked securely and positively after each of its movements in either direction, and is always positively and effectively released by action of a special form of electromagnet, incidental to the electrical control of the shutter for the purpose of shifting it from one of its positions to the other.

I also seek, as far as practicable, to discard the use of springs and to render the control of the shutter independent of the force of gravity.

Reference is made to the accompanying drawing forming a part of this specification, and in which like characters of reference indicate like parts throughout the figures.

Figure 1 is a plan view of my improved annunciator drop, showing the mechanism as partly broken away.

Figure 2 is a substantially central horizontal section through the annunciator drop.

Figure 3 is a fragmentary perspective, showing a group of pole pieces forming a part of my device.

Figure 4 is a perspective of the rocking armature used for actuating the shutter.

Figure 5 is a perspective of the shutter.

Figure 6 is a view, partly a perspective and partly a section of the back plate of the device.

Figure 7 is an end elevation of my improved annunciator drop, showing the device as it might be seen by an observer standing at the right of Figure 1, and looking to the left according to this figure.

Four magnets are shown at 7, 8, 9, 10, and are of the kind commonly designated in this art as single magnets. These magnets are provided with iron cores 11, 12, 13, 14, and these cores are provided with field poles $11^a$, $12^a$, $13^a$, $14^a$, integral with them and having the form shown.

Separate from the magnets 7, 8, 9, 10, and mounted thereupon at the ends thereof opposite the field poles just mentioned, are pole pieces 15, 16, 17, 18, held in place by screws 19. For this purpose, the pole pieces are provided with holes $19^a$, as shown more particularly in Figure 3. The pole pieces are further provided with portions $15^a$, $16^a$, $17^a$, $18^a$, which are merely elongations and which extend inwardly when the pole pieces are in place.

A back plate is shown at 21, and is stamped out of non-magnetic sheet metal, such as brass. The pole pieces 15, 16, 17, 18 and the back plate 21 are mounted upon the magnet cores by means of screws 19. The back plate 21 is provided with a hollow boss 22, having the general form of a nipple. This nipple is provided with a hole 23, and is used for supporting certain parts, as hereinafter described.

A front plate is shown at 24, and is made of sheet metal stamped out, preferably brass, but in every instance made of non-magnetic material. The front plate is provided with two portions 25, 26, integral with it but partially severed and bent out parallel with each other, so as to form yokes, serving the general purpose of bearings. Screws 27 are used for securing the yokes upon the magnets.

A latch pin appears at 28, and has the form of a straight rod of small diameter. Mounted rigidly upon the latch pin and carried thereby is a disk armature 29, located in immediate proximity to the adjacent portions of the pole pieces shown in Figure 3 and above described. A spiral spring 30, partially housed within the hollow boss 22, presses constantly against the disk armature 29, and serves to retract the latch pin 28 after each movement of the latter to the left.

A rocking armature is shown at 31, and has the general proximate form of a sector of a cylinder. It is provided with stop lugs $31^a$, $31^b$, which are simply portions of metal integral with the sector just mentioned, this sector being of sheet soft iron

or soft steel. Incidental to the striking up of the stop lugs, and the partial severance of the metal in consequence, holes $31^c$, $31^d$ are formed in the sector. The sector is further provided with two portions 32, 33, integral with it and bent over to form bearings, as may be understood from Figure 4. These bearings are provided with holes 34, and the bearing 32 is provided with an opening 35. This opening is so positioned and proportioned that a locking tongue 40, carried by a member 38 as hereinafter described, may extend into the opening, for the purpose of holding certain movable parts in predetermined relative positions, as explained below.

A shutter appears at 36, and is made entirely of sheet metal. It is provided with ears 37, integral with it and bent as shown in Figure 5, in order to hold a display panel or a card carrying a legend to be displayed. The shutter is further provided with portions 38, 39, each substantially triangular in contour, and bent over so as to extend in a direction lateral to the general plane of the shutter. The portion 38 is provided with the tongue 40, above mentioned. The portions 38 and 39 are provided with holes 41, 42, and serve as bearings for supporting the shutter.

In assembling the parts the armature 31 is first placed in its proximate position, and thus located between the two yokes 25 and 26. Next the shutter 36 is brought substantially into its position, so that the yokes 25 and 26 are located between portions 38 and 39 which serve as bearings for the shutter. The pivot pin 43 is next threaded through the various holes provided for the purpose in the bearings as just described and in the yokes 25 and 26, and then the tongue 40 is bent through the opening 35. The tongue fits neatly into this hole, and thus serves to secure the rocking armature and the shutter together, so that they rock practically as a unit upon the pivot pin.

The tongue 40 also serves another purpose. By lodging against the adjacent portions 44, 45 of the yoke 25 the tongue prevents excessive travel of the rocking armature and the shutter. Thus the tongue 40 and parts coacting directly therewith act collectively as a limiting stop for both the rocking armature and the shutter.

The magnets 7 and 8 are of different polarity, and are energized together as a pair, for the purpose of causing the armature and the shutter, as a unit, to rock in a clockwise direction according to Figures 1 and 2. The magnets 9 and 10 are also of different polarity, and as a pair are energized together in order to cause the armature and shutter to rock in a contra-clockwise direction according to the figures mentioned.

The rocking armature and the shutter connected therewith as above described have a rocking movement of ninety degrees—that is, a quarter of a revolution. The stop lugs $31^a$ and $31^b$ are spaced apart by a trifle less than ninety degrees, as may be understood from Figure 2, so as to permit the necessary freedom of movement.

Whenever the magnets 9 and 10 are energized, the rocking armature 31 is rocked in a clockwise direction so that the shutter is shifted from the position indicated for it in Figure 1 to the one occupied by it according to Figure 2. Whenever the magnets 7 and 8 are energized, however, the armature 31 is rocked in a contra clockwise direction; in other words, is shifted from its position indicated in Figure 2 to that in which it appears in Figure 1.

When either pair of magnets are energized, the corresponding pair of pole pieces 15, 16, or 17, 18, are also energized, and whenever either pair of these pole pieces are energized, the disk armature 29 is drawn to the left according to Figures 1 and 2, so as to increase the compression strain of the spring 30. As soon, however, as the magnets causing this movement of the disk armature to the left are de-energized, the pressure of the spring restores the disk armature, and consequently the latch pin 28, to normal position.

In the light of the foregoing description, the operation of my device may be readily understood.

The various parts being assembled, the annunciator drop is ready for use, in so far as the mechanism here involved is concerned.

Normally all of the magnets are de-energized. The rocking armature and the shutter, as a unit, have two normal positions, indicated respectively in Figures 1 and 2. From one of these positions to the other they may be shifted by simply energizing and de-energizing the magnets, as above described. Each time they are shifted, the latch pin 28 is shifted back and forth in the direction of its length. That is, when either pair of the magnets is energized for a moment, the latch pin makes a thrust to the left according to Figures 1 and 2, and then returns to its normal position at the right according to these figures. Thus normally the latch pin keeps the rocking armature 31, and consequently the shutter, securely locked and unable to move in consequence of any shock, vibration or jar. The latch pin can not be displaced in the direction of its length by any shock, vibration or jar, or by any other means except in response to the magnetic attraction of the pole pieces.

I do not limit myself to the precise mechanism shown, as variations may be

made therefrom without departing from the spirit of my invention. The scope of my invention is commensurate with my claims.

I claim—

1. In an annunciator drop the combination of a movable shutter, a rocking armature connected with said movable shutter for actuating the same, said rocking armature being provided with a stop lug, a magnet for causing said armature to rock in one direction, another magnet for causing said armature to rock in the opposite direction, a latch pin movable in the direction of its own length for the purpose of engaging and disengaging said stop lug in order to lock and release said rocking armature, and an armature carried by said latch pin and controllable by each of said magnets for the purpose of shifting said latch pin in the general direction of its length.

2. In an annunciator drop the combination of a movable shutter, a rocking armature connected with said movable shutter for actuating the same, a pair of magnets for rocking said armature in one direction of its travel, another pair of magnets for rocking said armature in the opposite direction of its travel, a back plate connected with all of said magnets for the purpose of supporting the same, a plurality of pole pieces mounted upon said magnets and disposed adjacent said back plate, an armature disposed adjacent said pole pieces and movable in one direction thereby, a locking member connected with said last mentioned armature and movable thereby for the purpose of engaging and disengaging said rocking armature, and a spring engaging said last mentioned armature and said back plate for the purpose of moving said locking member and said last-mentioned armature in a direction contrary to that in which they are moved by the action of said pole pieces.

CHARLES J. HENSCHEL.