

Improvements in release mechanisms for coin
chutes and the like

3

Field of invention

This invention relates to release mechanisms for coin chutes and the like. The invention is of primary application to coin chute release mechanisms employed in
10 --- public telephone coin boxes.

More particularly, the invention relates to a coin chute release mechanism of the kind having an escrow provided with a coin stop at which the leading coin of a succession thereof in the escrow is supported on a
15 shutter which is controllably displaceable laterally of the escrow to expose an opening in the floor of the escrow for a period which permits a specific number (including one) of coins to be released from the escrow before the shutter returns to its closed position to
20 support the next coin ready for release.

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Prior art

Hitherto, in coin chute release mechanisms of the above-stated kind, the coin supporting surface of the shutter has been located substantially flush with the floor of the escrow.

The invention

The mechanism according to the invention is characterised by a shutter having a coin supporting surface which lies at a distance below the level of the escrow floor predetermined to minimise risk that the next coin following release of the predetermined number will interrupt the return movement of the shutter at the end of the period of opening.

In known mechanisms of the above-stated kind, in particular as used in public telephone boxes, the shutter is operable to release the coins in the escrow successively, one after the other, in response to low voltage signal impulses available from within the telephone communications system. As only a weak operating impulse is available, a low inertia shutter is used, urged towards its normally closed position by a weak restoring force, e.g. derived from a weak spring.

The restoring force is sufficiently weak that the shutter will not stop a coin once it has dropped below the coin supporting surface of the shutter. It is, therefore only necessary for the low voltage signal impulse to be long

enough to hold open the shutter until the coin resting on it has travelled far enough to prevent the shutter closing (theoretically a very small distance). The coin will then continue to fall even though the impulse has died away and the shutter will automatically close behind the falling coin.

If the shutter coin supporting surface is flush with the escrow floor then a following coin may reach the level of the shutter supporting surface and in fact begin to drop below this level, before the shutter has closed. If this should happen, the following coin will follow the first coin down since the restoring force is not strong enough to jam the following coin.

Clearly the result will be a chain reaction and provided they are close to one another, all of the coins in the escrow would be released as a result of the first coin being released.

According to a preferred feature of the invention, means is provided for delaying the arrival of the following coin, at least onto the shutter supporting surface, to allow the shutter to close before a following coin can drop below the level of the coin supporting surface of the shutter.

In a preferred embodiment this delay is achieved by positioning the shutter supporting surface a short distance below the escrow floor. Where conventional U.K. coins of the realm are used the short distance has been found to be in the range 1 - 10 mm. Experience will allow the optimum level for the supporting surface of the shutter below the

- 4 -

level of the escrow, to be determined.

The preferred embodiment of the invention just described not only has the advantage of being very simple and inexpensive but also has the added advantage that it requires no additional power. This is important where the available power is limited as in a public telephone box in which the electrical current for operating the mechanism has to be derived from the signals along the telephone line. Consequently the preferred embodiment is highly desirable in such applications as compared with additional mechanisms which may require additional electrical power which would not necessarily be available in all applications.

In fact the power available from a telephone line is of such an order that even with the weak restoring force of the invention, batteries are to be used to provide the current impulse for operating the coin release mechanism and an electrical charging circuit is provided for charging the batteries during telephone calls.

While the above explanation has for simplicity been given with respect to a telephone coin box in which a single coin at a time is released under the control of weak signal impulses, it is to be appreciated that the invention is also advantageous in other coin chute release mechanisms of the stated kind even if plenty of power is available for shutter control in view of the simplicity and cheapness of the preferred embodiment of the invention.

In the accompanying drawings

Fig.1 shows diagrammatically in side view the lower part of the escrow of a coin chute release mechanism;

Fig.2 is a diagrammatic end view of the escrow;

Fig.3 is a diagram relating to the operation of a conventional coin chute release mechanism; and

Fig.4 is a diagram relating to the operation of the coin chute release mechanism of this invention.

In Fig.1, the reference 10 denotes the lower part of an escrow, for example of the form employed in a public telephone coin box. Towards the bottom of the escrow 10, advance of the coins 11A, 11B etc., in the escrow is blocked by an inclined stop 12. The leading coin 11A is thereby held supported on a shutter 13 at least partly closing an opening 14 in the floor of the escrow 10.

As indicated in Fig.2 the shutter 13 is displaceable laterally of the escrow 10, against the action of a weak restoring force provided by a leaf spring 15, under the control of signal impulses, for example low voltage impulses available from within the telephone communications system in accordance with operation of push buttons to complete the connection of a telephone call (Button A) or to break the connection (Button B), or in response to the electrical condition in the system when the hand set is replaced. Where means is provided for determining immediately at the end of a telephone call the number of units which have to be charged

- 6 -

for, appropriate electrical signals can be supplied to the release mechanism so as to release the appropriate coins into the bank and to return any coins not required to the user. The shutter 13 is accordingly displaced towards one side of the escrow 10 or towards the other side thereof, to release the coin 11A either to a bank or to return.

In accordance with the invention, the coin supporting surface 13A of the shutter 13 is positioned a predetermined distance below the level of the floor 10A of the escrow 10.

Referring now to Fig.3, which shows a conventional coin chute release mechanism, the shutter supporting surface 23A of the shutter 23 is flush with the floor 20A of the escrow 20. When a coin is released during displacement of the shutter 23, the next coin has only to roll forward to assume the position indicated at 21, before the return movement of the shutter is blocked and the mechanism may become jammed (if the restoring force is too large) or more likely, the following coin will be channelled the wrong way.

Fig.4 shows in similar manner the coin chute release mechanism of this invention, employing the same references as in Figs. 1 and 2. The next coin must now roll forward a greater distance, to assume the position indicated at 11, before there is risk of blocking the return movement of the shutter 13. Although this next coin has started from a slightly more advanced position than in the known mechanism, the actual distance which it has to roll on its periphery,

without entering a substantially free fall movement, is increased, before a shutter blocking position is reached. The exact distance at which the coin supporting surface 13A of the shutter is positioned, below the floor 10A of the escrow 10, is predetermined in relation to the construction and materials of the escrow and the coins being handled so as to maximise the time taken for the next coin to attain a shutter blocking position, and thereby to minimise risk of jamming.

While in this specification the means for releasing the coins at the bottom of the escrow is referred to as a shutter subject to a restoring force, it is to be appreciated that the shutter may itself be constituted by a spring element mounted with a self-restoring action.



CLAIMS

1. A coin chute release mechanism including an escrow provided with a coin stop at which the leading coin of a succession of coins in the escrow is supported on a shutter which is controllably displaceable laterally with respect to the longitudinal axis of the escrow to expose an opening in the floor thereof through which coins in the escrow are released and in which the coin supporting surface of the shutter is arranged to lie below the level of the escrow floor at a predetermined distance arranged so that the next coin following the last to be released from the escrow will not interrupt the return movement of the shutter.
2. A coin chute release mechanism according to claim 1 in which the shutter is operated under the control of electric signal impulses.
3. A coin chute release mechanism according to claim 1 or 2 in which the shutter is arranged to be centrally located to close the opening in the floor of the escrow in the non-activated condition and is arranged to be deflected in a first lateral direction to cash a coin in the escrow and in a second lateral direction to refund a coin in the escrow.
4. A coin chute release mechanism according to claim 1, 2 or 3 in which the shutter is arranged to be of low inertia urged towards its closed position by a restoring spring.
5. A coin chute release mechanism according to claim 4



in which the restoring spring is arranged such that the shutter does not trap a coin once it has dropped below the coin supporting surface of the shutter.

5 6. A coin chute release mechanism according to any one of the preceding claims in which the coin supporting surface of the shutter is arranged to lie in the range of 1 to 10 millimeters below the floor of the escrow.

7. A coin chute release mechanism according to any one of the preceding claims for use in a coin-operated
10 telephone instrument, the shutter mechanism being operated by an electromagnet supplied by power taken from a telephone line.

8. A coin chute mechanism substantially as herein
15 before described with reference to Figs. 1, 2 and 4 of the accompanying drawings.

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