March 17, 1942. W. PATZER ET AL 2,277,018

COIN CHUTE

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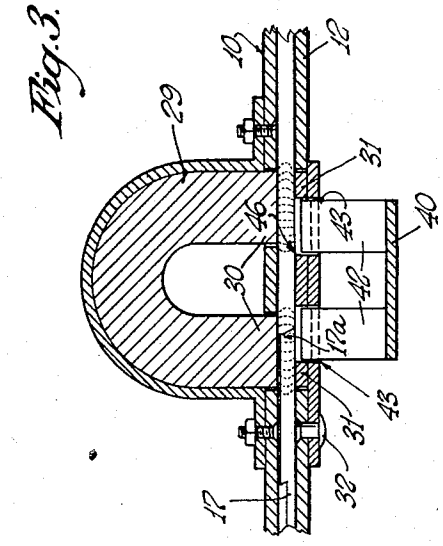

Fig. 3.

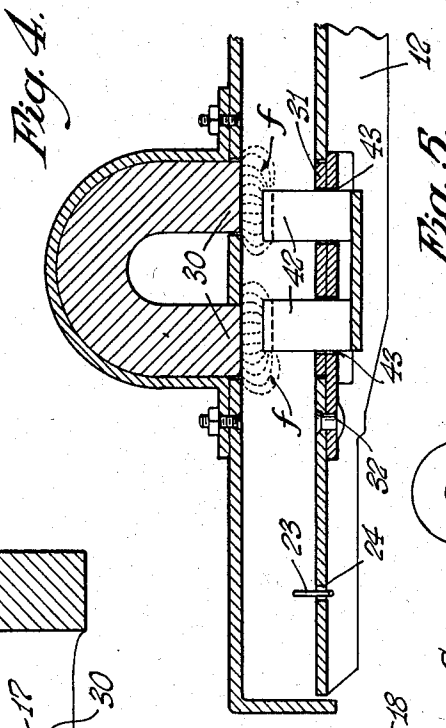

Fig. 4.

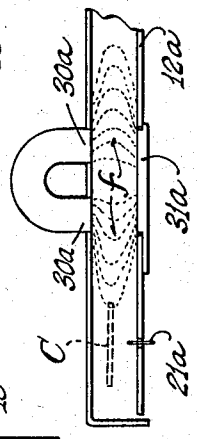

Fig. 5.

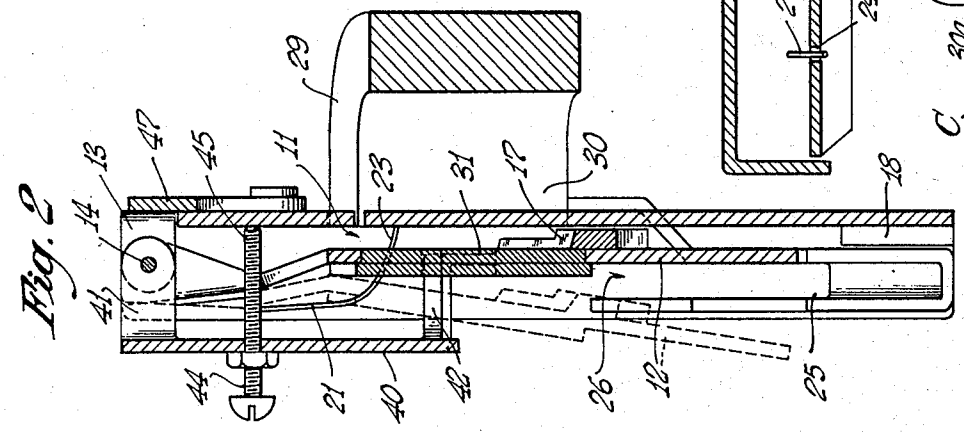

Fig. 2

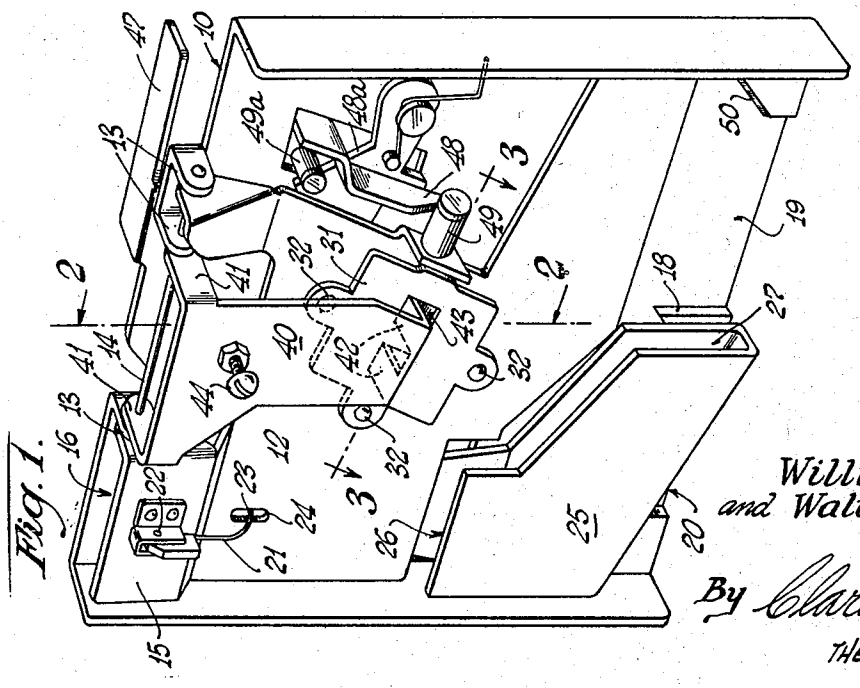

Fig. 1.

William Patzer
and Walter A. Tratsch
INVENTORS

By Clarence E. Threedy
THEIR ATTORNEY.

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COIN CHUTE

William Patzer and Walter A. Tratsch,
Chicago, Ill.

Application October 2, 1939, Serial No. 297,474

4 Claims. (Cl. 194—101)

This invention relates to coin testing devices, and particularly to the type known as a coin chute, which utilizes a magnet, among other things, for testing a coin and which includes some means such as a gate for opening a passage from the chute to provide egress for unacceptable or arrested coin elements.

The present invention constitutes an improvement over that shown in our copending application Serial No. 286,789, filed July 27, 1939, and the present application is a companion application to our application filed October 7, 1939, Serial No. 298,394.

A principal object of the invention is the provision of means for concentrating the field of the testing magnet when the chute is in normal condition to receive a coin, and means for preventing the spreading of said field when the gate or other passage opening means is operated to permit discharge of arrested coin elements from the chute so that such coin elements cannot be held in the chute by the spreading field to prevent discharge by the scavenging means or mechanism.

Viewed from another aspect, it is an important object of the invention to provide in combination with a gate, in a coin chute, a permanent magnet arranged on a side of the passage opposite the gate, magnetically attractable means on the gate opposite the magnet for concentrating the field of force of the magnet in a certain area of the passage and adjacent to the magnetically attractable means, which remains relatively stationary when the gate is opened and which induces enough of the field of force of the magnet to prevent effective spreading of said field so that arrested coin elements in the passage adjacent the magnet will not be drawn into said field when the gate is opened.

Other objects and advantages of the invention reside in certain details of construction as well as the arrangement and cooperation of the parts of the preferred embodiment described hereinafter in view of the annexed drawing, in which:

Fig. 1 is a perspective view of the chute looking toward the gate;

Fig. 2 is a vertical transverse section through the field-concentrating means of the chute along line 2—2 of Fig. 1;

Fig. 3 is a horizontal fragmentary section through the magnet and concentrating means, looking in the direction of line 3—3 of Fig. 1;

Fig. 4 is a horizontal section similar to Fig. 3, but showing the gate in open position; while

Fig. 5 is a diagram of the action of the field of force without the concentrating means.

As seen in Fig. 1, the preferred form of the device includes a main plate member 10 adapted to be mounted in upright position and constituting one side of a coin passage 11 (Fig. 2). The opposite wall portion of the passage is defined by a gate 12 pivotally mounted as at 13 on ears struck from the main plate and through which is extended a suitable pintle rod 14. The gate tends of its own weight to lie in parallelism with the main plate member 10, the major portion of the coin passage 11 being formed between the gate and the main plate member, and the gate having an upper offset portion 15 spaced from the main plate member so as to provide a coin entrance 16.

Between the gate and main plate there is disposed a member providing an inclined ledge 17 (Fig. 2) which is preferably attached to the inner side of the gate. The upper end portion of the runway or ledge lies beneath the coin entrance 16 while the lower extremity terminates in the region above a separator 18 attached to the plate member about midway between its vertical sides so as to define a pair of exit passages 19 and 20, the former of which is a reject exit, and the latter of which is an acceptance exit.

Means for testing the coins deposited in the device includes the provision of a feeler 21 pivoted as at 22 on the gate and having an end portion 23 projecting through an opening 24 in the gate (Figs. 2 and 4 also) so as to lie in the path of coin elements deposited in the entrance and moving down onto the runway, the object of the arrangement being to arrest apertured and certain deformed coin elements in the region immediately adjoining the entrance. Elements arrested by the feeler 21 are intended to be discharged from the chute passage by opening of the gate, which ultimately withdraws the feeler from the passage, such elements gravitating into a downwardly inclined reject apron 25 having an open mouth 26 beneath the upper bottom edge of the gate and having a discharge mouth 27 terminating opposite the reject exit 19 into which the ejected coins move when the gate is opened.

A further testing means (Figs. 2 and 3) includes some form of magnet, for example, a permanent magnet 29, secured to the outside of the main plate member 10 so that its pole pieces 30 are disposed substantially opposite the lower end portion 17a of the runway 17.

Means for concentrating the lines of force issuing from the pole pieces 30 of the magnet and hence the field emanating therefr

the provision of a plate 31 having a portion fitted into an opening in the gate and secured to the latter as at 32, the plate being made of a suitable paramagnetic substance and so dimensioned with respect to the pole pieces 30 that it will induce the major portion of the flux or field of force issuing from the magnet. Thus, the effective field of the magnet is concentrated in the region adjacent the lower end of the runway 17, so long as the gate is closed to dispose the keeper plate 31 in proximity to the pole pieces of the magnet, as illustrated, for instance in Fig. 3.

Difficulty has been encountered in prior arrangements of this kind because persons with fraudulent intent have deposited one or more magnetically attractable coin elements in the chute with the foreknowledge that such coin elements would be arrested by the first testing means ahead of the magnet—that is, by the feeler 21, for example—and thereafter manipulation of the gate for the purpose of effecting return of arrested coin elements would cause the magnetically attractable element to be drawn into the field of the magnet and held there until the gate would be closed either for the purpose of deliberately jamming the chute or to effect a working or jostling of such coin elements, or subsequently deposited fraudulent coin elements, one or more of which, by certain manipulation of the gate, would utimately be worked past the magnet and be thus fraudulently caused to be accepted.

Such fraudulent manipulation of this class of device results from the fact that as soon as the gate 12a of Fig. 5 is opened and the keeper 31a is therefore withdrawn from the pole pieces 30a of the magnet, the field tends to widen out in the manner illustrated by the lines of force F, and this field will spread far enough to influence a coin element C positioned in the region adjacent the feeler 21a, with the result that such coin will not gravitate from the passage even though the gate is wide open, but will instead be quickly pulled into the more concentrated portions of the field, usually opposite the poles of the magnet, with the objectionable consequences heretofore referred to.

The present invention has as its principal object the provision of means for preventing the expansion or spread of the otherwise normally concentrated field of the magnet, and this means includes in its broad aspect the provision of a magnetically attractable member arranged in the normally concentrated field of the magnet and arranged to remain relatively stationary with respect to the keeper plate 31 on the gate when the gate is open.

A preferred arrangement of this auxiliary concentrating means includes a plate 40 of magnetically attractable or paramagnetic material such as soft iron or any of the magnetic alloys, which is provided with opposite offset ears 41 along its upper edge, said ears being pivotally supported on the pintle rod 14 so that the plate will hang in pendent condition much in the same manner as the gate 12. The lower end portion of the plate 40 is slotted and offset laterally to provide a pair of legs or pole pieces 42 (Fig. 3 particularly), each of which extends through a suitable opening 43 in the keeper plate 31.

Adjusting means for the field-concentrating member includes a set screw 44 threaded through the plate 40 with its end portion 45 bearing against the inner face of the main plate member 16 so that the screw may be turned up various amounts to dispose the pivoted plate 40 in a normal position with the pole legs or pieces 42 lying substantially flush with the inner face of the keeper plate and the inner surface of the gate as indicated at 46 in Fig. 3. This adjustment brings the pole legs 42 into close proximity to the poles 30 of the magnet without obstructing the coin passage.

The gate 12 is opened by a hand-operated or controlled lever 47 (Fig. 1) which moves a cam 48 against a roller 49 on the gate and swings the latter outwardly of the main plate and into open position, thus removing the normal support of the runway or ledge 17 from beneath coin elements in the passage, with the object of causing such coin elements to gravitate into the apron 25 or into the reject exit 19. Operation of the lever 47 also causes the roller 49a to move a scavenging sweep or arm 48a from its normal retracted position across the poles of the magnet to dislodge any coin elements held by the latter.

When the gate is opened by manipulation of lever 47 as aforesaid, the field-concentrating plate 40 remains in relatively stationary condition, this disposition of the parts being illustrated in Fig. 4 wherein it will be observed that the pole legs 42 induce enough of the lines of force F from the magnet to prevent spreading of the field appreciably toward the testing finger 23. As a result of this arrangement, coin elements arrested by the finger 23, even though they be magnetically attractable, may gravitate directly into the apron 25 since there is no appreciable field close to the finger 23 and strong enough to pull the coin elements toward the magnet.

In the normal operation of the chute, acceptable coin elements pass through the field of the magnet at a predetermined rate in approaching and leaving the end of the runway, and this field affects dynamic properties of the coin elements in a way such that acceptable coins always follow the same general trajectory and engage a rebound anvil 50 which changes the course of their movement and carries them over the exit reject 19 and the separator 18 into the acceptance passage 20.

If, for any reason, coin elements, whether acceptable or not, fail to negotiate the chute passage and become lodged therein, the patron manipulates the level 47 to open the gate and effect return of the arrested coin element. If such elements happen to be magnetically attractable, and, whether deposited with fraudulent intent (e. g. iron slugs, washers, etc.), or without such intent (e. g. Canadian nickels), they will be prevented from jamming the chute by action of the field-concentrating means 40—42.

Having thus described our invention, what we claim as new and desire to protect by Letters Patent is:

1. In a coin chute, means providing a coin passage having an opening constituting a reject exit, a gate normally closing said opening and exit and arranged to be opened to permit discharge of arrested coin elements from said passage, a magnet disposed on a side of said passage opposite said gate, magnetic means on said gate for concentrating the field of force of said magnet with respect to a certain region of said passage, and stationary magnetic means mounted in position with respect to said first-mentioned magnetic means to limit the spreading of said field of force when the gate is opened and moves said first-mentioned magnetic means away from the magnet.

2. In a coin chute including a gate and a mag-

net arranged opposite the gate, said gate being normally closed to define a side portion of the passage and being adapted to be opened to permit discharge of coin elements lodged in the passage, the combination with said gate and magnet of magnetically attractable means on the gate opposite the magnet for concentrating the field of force from the latter when the gate is closed and relatively stationary paramagnetic means mounted for adjusting movement into the field of said magnet in alignment with said first-mentioned magnetic means and adapted to induce the major portion of the field of force of said magnet to concentrate said field with respect to said passage when the gate is open and said first-mentioned magnetic means is thereby moved away from the magnet.

3. In a coin chute including a gate and a magnet arranged opposite the gate, said gate being normally closed to define a side portion of the passage and being adapted to be opened to permit discharge of coin elements lodged in the passage, the combination with said gate and magnet of magnetically attractable means on the gate opposite the magnet for concentrating the field of force from the latter when the gate is closed, and relatively stationary paramagnetic means mounted for adjusting movement toward and away from said magnetically attractable means and magnet and having a polar portion projecting through said magnetically attractable means to induce the field of force of the magnet cooperably with said magnetically attractable means, said paramagnetic means being adapted to remain relatively stationary with respect to the magnet when said gate is opened and said polar portions by induction limiting the expansion of said field.

4. In a coin chute, the combination with a gate arranged to be opened laterally of the chute passage to provide egress for arrested coin elements, of a permanent magnet mounted on a side of the passage opposite the gate, a keeper plate mounted on the gate opposite the magnet to concentrate the field of the latter, and an auxiliary magnetic member pivotally mounted for movement in a direction toward and away from said plate and magnet and having parts constituting polar portions projected through said plate toward said magnet, means for maintaining said auxiliary member with said polar portions thereof in adjustably spaced relation relative to said magnet, said keeper plate and auxiliary magnetic member being arranged for relatively independent movement such that when said keeper plate is moved away from the magnet by opening of the gate, said polar portions of the auxiliary magnetic member will remain stationary and limit the spreading of the field of the magnet which would otherwise occur as a result of movement of the keeper plate away from the magnet whereby magnetically attractable coin elements in said passage adjoining the magnet will not be drawn into the field of the latter and be prevented from passing out of the chute.

WILLIAM PATZER.
WALTER A. TRATSCH.