Nov. 11, 1947. L. J. ANDRES 2,430,658

COIN CONDUIT

Filed Nov. 26, 1945

Fig. 1.

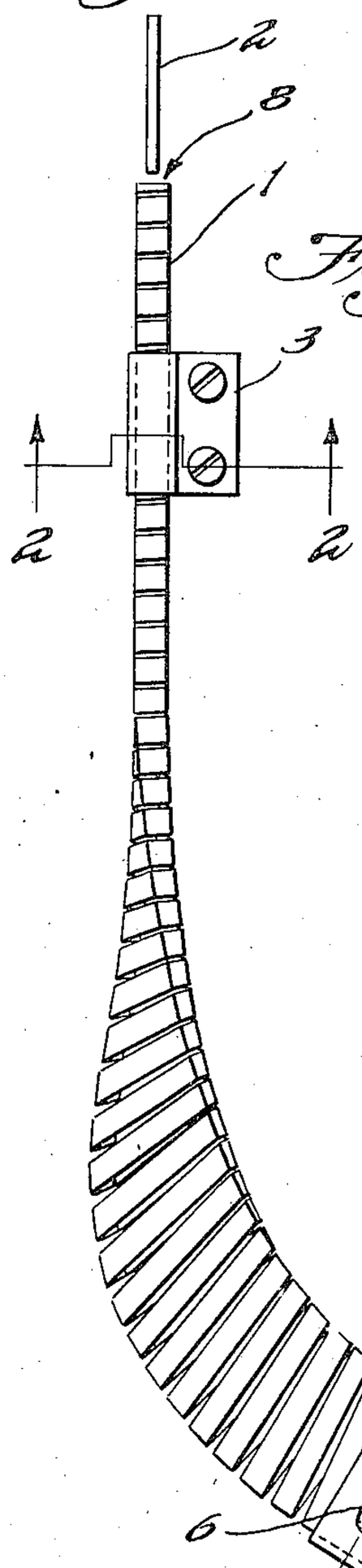


Fig. 4.

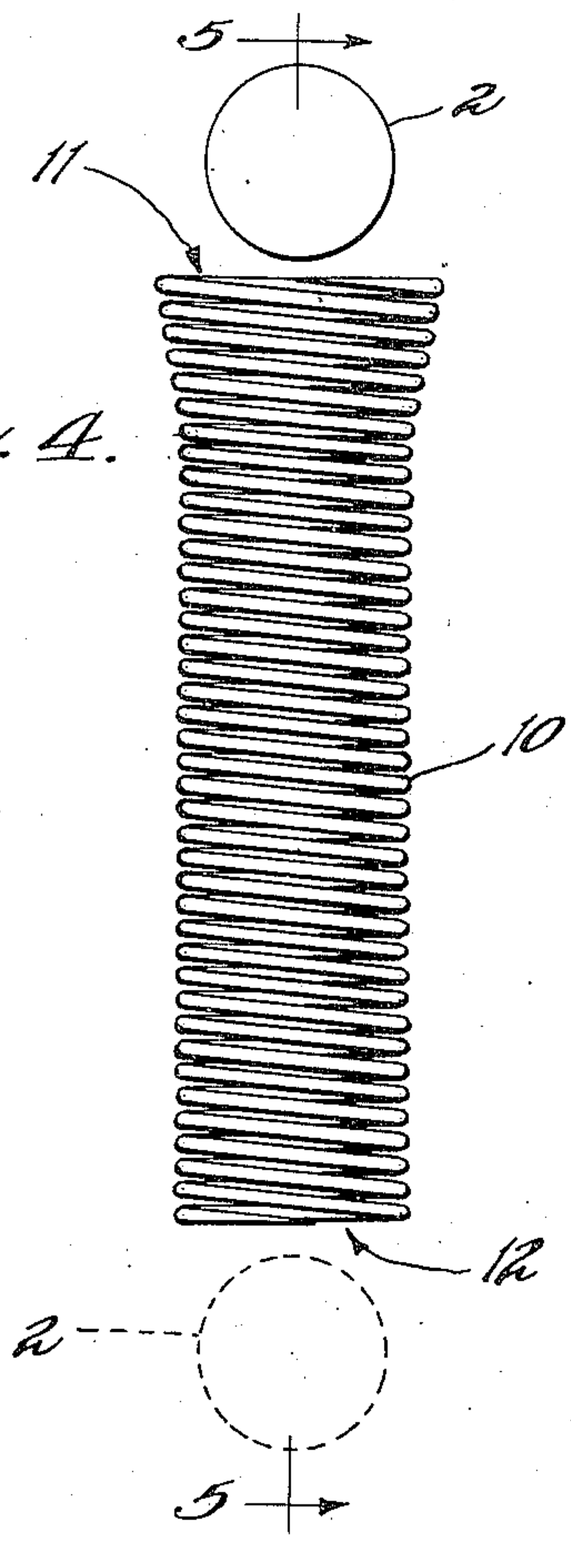


Fig. 5.

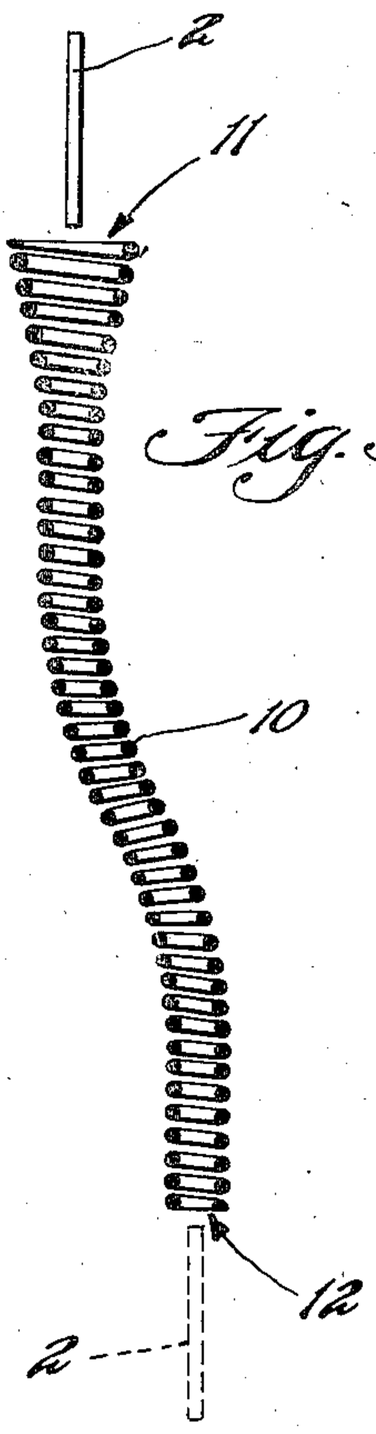


Fig. 3.

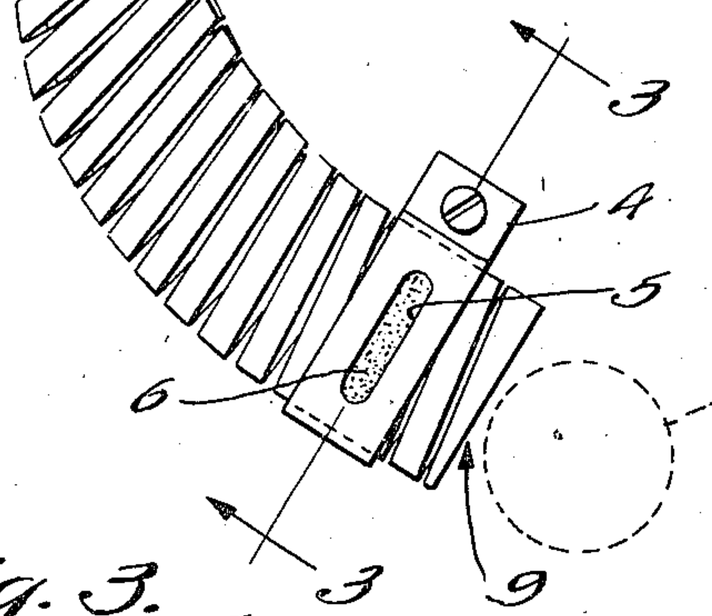
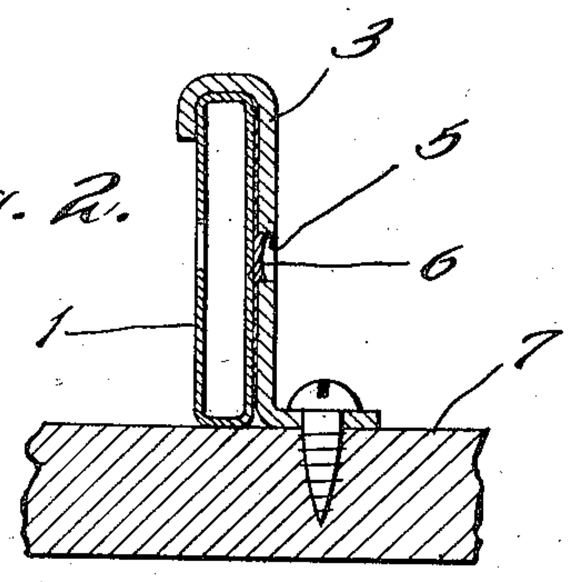
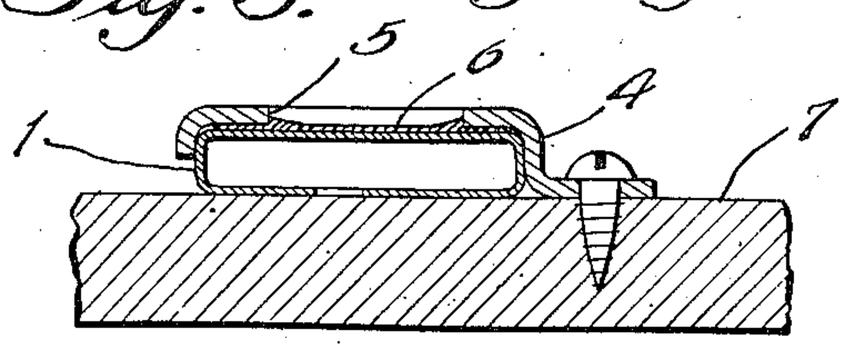


Fig. 2.





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COIN CONDUIT

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3 Claims. (Cl. 193—25)

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This invention relates in general to coin devices and more particularly to flexible conduit for guiding coins propelled by gravity. Coin operated machines frequently utilize coin conducting chutes of irregular contour for conducting coins to and from slug rejectors and other mechanism elements during their travel to a cash box. The convenient placement of coin operated mechanisms in a coin machine frequently required a coin path of irregular, curved or spiral shape. Furthermore during the operation of certain coin machines it is necessary to have one or more of the coin handling elements in movable relation with other fixed elements. This condition is usually fulfilled through the use of pivotally mounted or hinged chutes which are expensive and frequently functionally troublesome. Coin chutes previous to this invention were made from extrusions, stampings or castings which in the case of irregular shapes necessitated expensive tools, dies and/or patterns for their manufacture, and required a separate set of manufacturing tools for each particular shape used. The noise caused by a coin descending in ordinary solid metal chutes is undesirable and in some cases required the application of sound absorbent material to their outer surfaces.

This invention provides a relatively noiseless pre-formed coin conducting means or tube manually adaptable and mechanically movable to a large variety of contours and contemplates a manufacturing method requiring relatively inexpensive and simple tools.

A principal object of the invention is the provision of a relatively non-resonant flexible coin conduit including novel mounting means for retaining the conduit in any one of a large variety of contours and positions.

A further object of the invention is the provision of a helical winding forming a coin conduit having a gradual enlargement of the winding at one end thereof forming an integral entrance funnel.

Another object of the invention is the provision of a method of manufacture of pre-formed straight lengths of flexible coin conduit including a method of preparing mounting means therefor.

Other objects and advantages in two embodiments of the invention are described and shown in the following specification and drawing in which;

Fig. 1 is an elevation illustrating the coin conduit formed in one predetermined contour.

Fig. 2 is an enlarged cross sectional view taken through section line 2—2 Fig. 1.

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Fig. 3 is an enlarged cross sectional view taken through section line 3—3 Fig. 1.

Fig. 4 is an elevation illustrating an alternate form of construction of the conduit shown in Fig. 1.

Fig. 5 is a cross sectional view through section line 5—5 Fig. 4.

Fig. 1 shows a preferred form of the coin conduit which is essentially a flattened helical spring made from flat wire or ribbon and having a substantially rectangular cross section including an inner passage having cross sectional dimensions of width and length slightly in excess of the thickness and diameter respectively of the coin to be gravitated therethrough. This conduit is intended to be made in straight lengths by a method to be hereinafter described, which lengths may be manually shaped or formed to provide a predetermined irregular coin path upon installation in coin machines. The conduit may be formed in a great variety of contours of which a particular shape is shown in Fig. 1. Mounting brackets 3 and 4, Figs. 2 and 3, illustrate a means for retaining the conduit to a flat surface where a 90 degree twist and a lateral displacement of a coin is desired. When a coin 2 is released above the entrance 8, it will gravitate through the inside channel and in so doing will be guided and turned 90 degrees and subsequently laterally displaced from its initial vertical path as shown by the dotted representation of the coin 2 leaving the exit 9 of the conduit.

Two forms of metal mounting brackets 3 and 4 are shown in cross section in Figs. 2 and 3 conforming to a portion of the outer surfaces of the conduit and are provided with integral extensions having a screw hole or holes for mounting to a surface such as 7. Each bracket is provided with an aperture 5 therethrough adjacent to the flat side of the conduit, which aperture is preloaded, by staking or fusing, with solder and solder flux. Upon installation the conduit is manually formed and held by brackets 3 and 4 secured by suitable screws. The conduit is permanently retained in this predetermined position by heating the bracket with a soldering iron or torch which will cause the solder to flow by capillary action between the bracket and the conduit and thus permanently bond the bracket to the conduit as is indicated by the shading 6 in Figs. 2 and 3. It is apparent that the mounting extension of the bracket may assume different lengths and shapes to accommodate different conditions of installation.

Fig. 4 shows an alternate form of the coin con-

duit tube utilizing a flattened helix 10 of round wire having an enlarged integral opening or funnel in the upper end. The round wire form provides greater flexibility than the ribbon form previously described, hence the round wire form may be preferred for short coin paths such as illustrated in the offset contour shown in Figs. 4 and 5 where the coin exit 12 is laterally displaced with respect to the coin entrance 11. It is obvious that the integral entrance funnel for guiding the coin into the conduit shown in Figs. 4 and 5 is equally applicable to the ribbon form conduit shown in Fig. 1.

The method of manufacture consists of first tightly winding, by well known means, the ribbon or wire on a straight steel mandrel, said mandrel having length and cross sectional dimensions corresponding to the desired inside dimensions of the conduit, then placing the mandrel with winding held tightly in place in a furnace and raising the temperature sufficiently high to anneal the metal used and thus relieve the internal winding stresses set up in the winding process. When the winding has cooled it is removed by sliding it from the mandrel and the conduit thus formed will retain a relatively straight shape which may be subjected to flexibility in all directions.

When it is desirable to use a dielectric coin conduit, a helical conduit is made of a thermoplastic ribbon such as cellulose acetate or the like by winding the ribbon on a mandrel as previously described and subjecting the winding and mandrel to a temperature just sufficiently high to soften the winding, and when cooled and removed from the mandrel the conduit will be substantially equivalent to the metal form previously described. When the plastic conduit is retained by brackets 3 and 4 as previously described one of many well known adhesives or cements miscible to the plastic which will flow at a lower temperature than the plastic is substituted for the solder 6 in the cavity 5.

Having described my invention I claim:

1. A flexible tubular coin conduit for conducting gravitating coins comprising a helical metal winding of substantially uniform cross section the inside walls of said conduit having substantially square corners and forming a slot having long sides with narrow ends to thereby prevent rotation of a coin about its diameter, said square corners permitting free passage of said coins, the upper end of said winding, the coils of which are of gradually increasing cross section toward said

upper end, thereby forming an integral funnel means therewith, said upper end also having inner and outer flat sides lying in planes extending parallel to the horizontal axis of the conduit, whereby to provide a conduit which is oblong in cross-section and of a size slightly larger than the cross-sectional dimensions of a coin of given size whereby a coin of predetermined size will be guided edgeways in said funnel means and through said winding in a predetermined descending path.

2. A flexible tubular coin conduit for conducting gravitating coins comprising a helical metal winding of substantially uniform cross-section, said winding having inner and outer flat sides lying in planes extending parallel to the longitudinal axis of said conduit, including a metal bracket means for securing said conduit, a portion of said bracket means shaped to and in close contact with a portion of the outer surface of said conduit, said bracket having a cavity therein preloaded with solder at a place of contact with said conduit whereby to provide a conduit which is oblong in cross-section and of a size slightly larger than the cross-sectional dimensions of a coin of given size whereby the application of heat will solder said bracket to said conduit for retaining said conduit in a predetermined position.

3. A flexible tubular coin conduit for conducting gravitating coins comprising a helical plastic winding of substantially uniform cross section, including a bracket means for securing said conduit, a portion of said bracket means shaped to and in close contact with a portion of the outer surface of said conduit, said bracket having a cavity preloaded with an adhesive cement at a place of contact with said conduit whereby the application of heat will cause the said cement to bond the bracket and conduit together for retaining said conduit in a predetermined position.

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