Jan. 1, 1963 R. T. ALLEN 3,071,243

VERTICAL COIN COUNTING TUBE

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Fig. 1

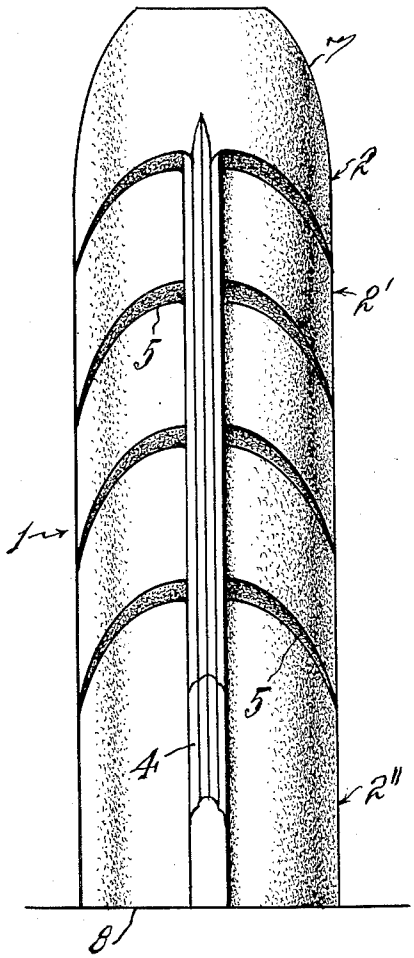
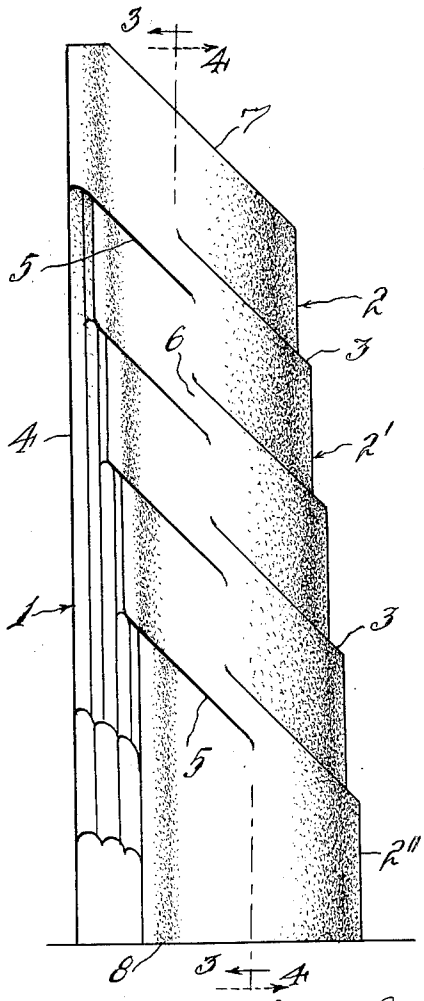


Fig. 2



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Fig. 3

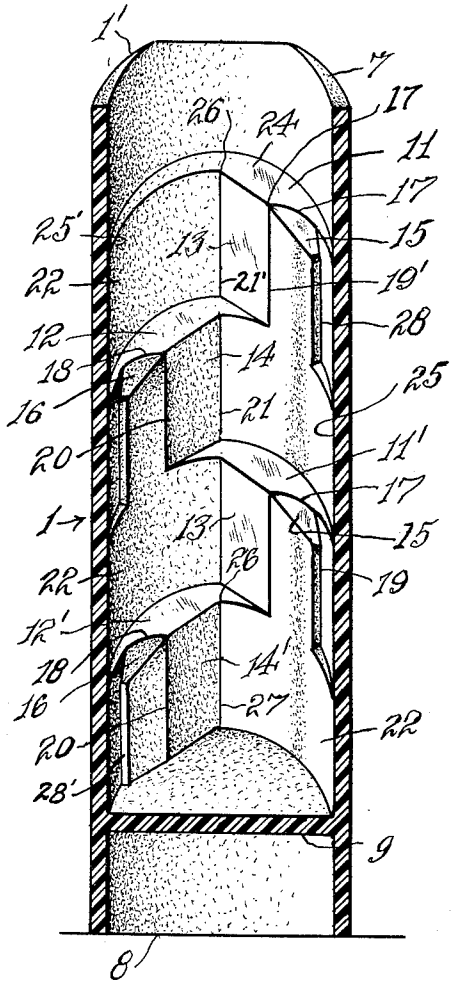
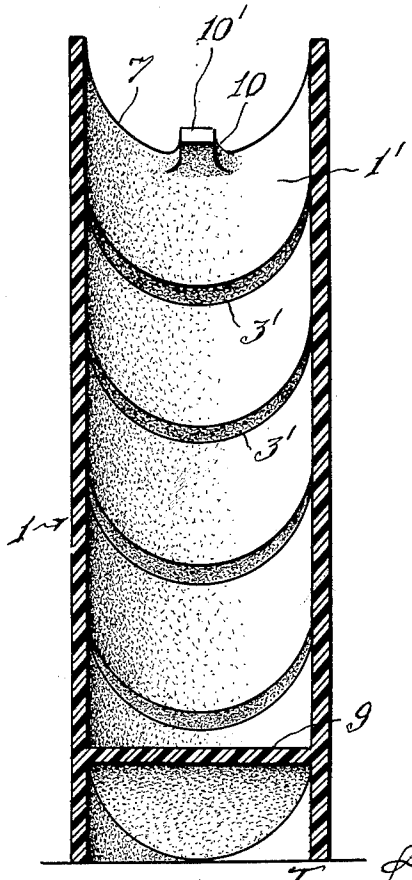


Fig. 4



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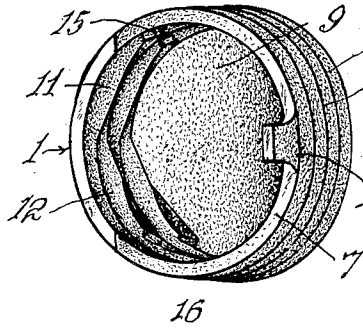
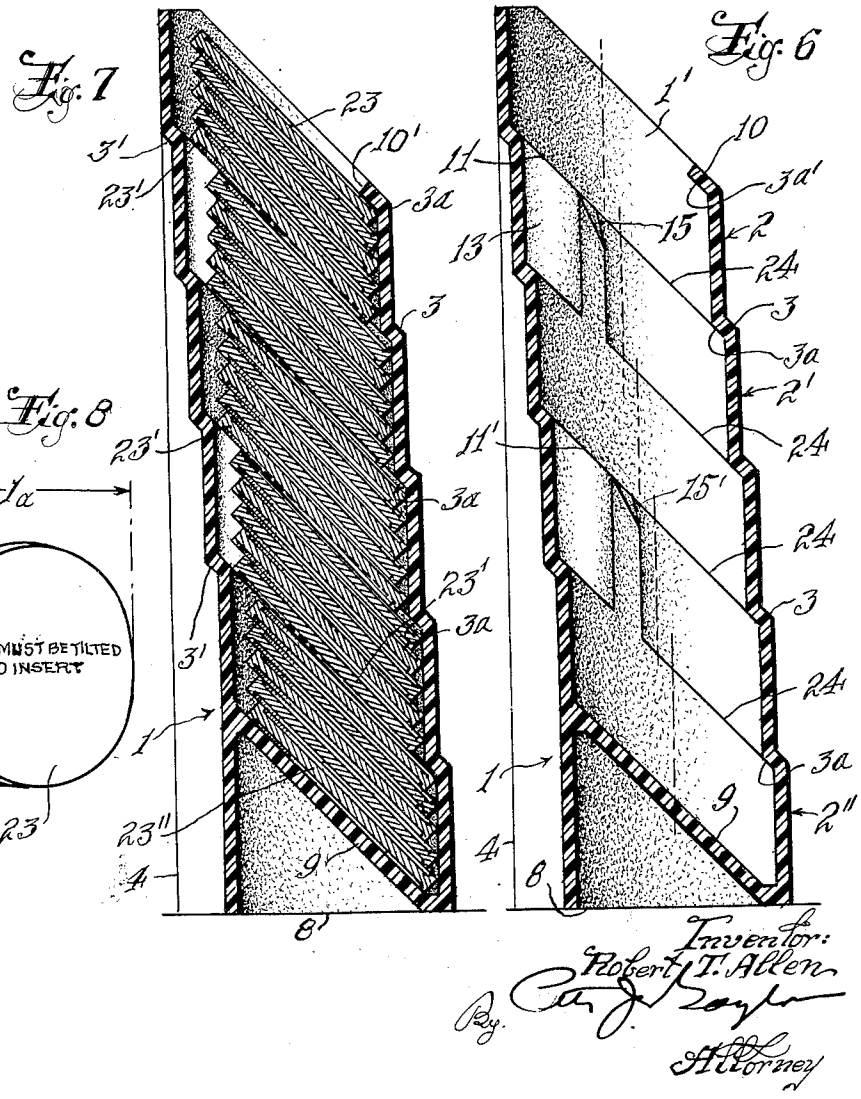


Fig. 5



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Fig. 9

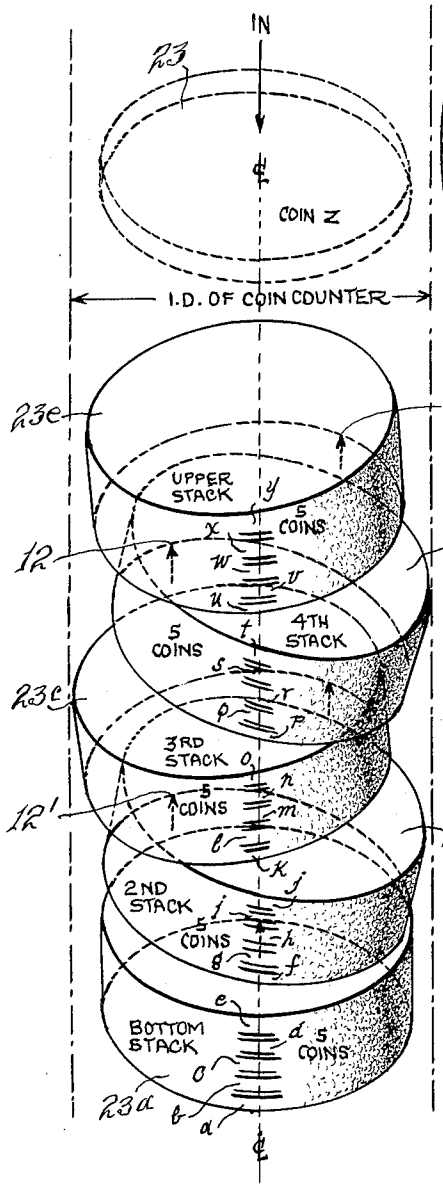


Fig. 10

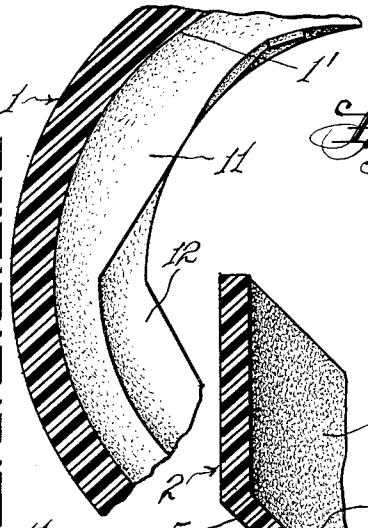


Fig. 11

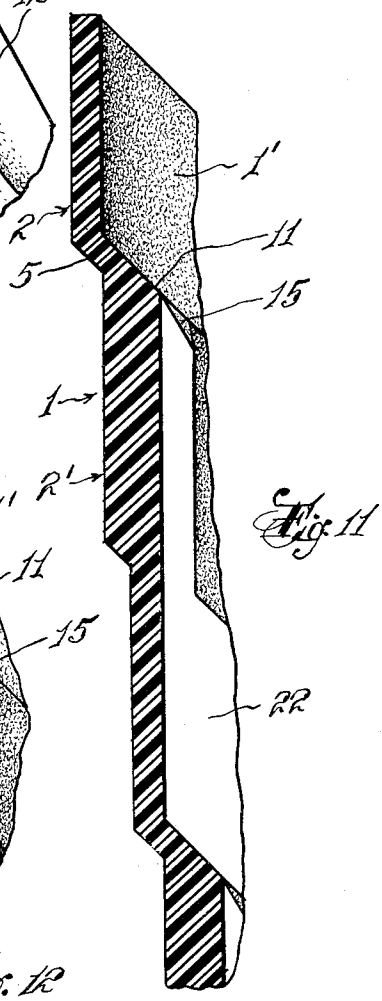
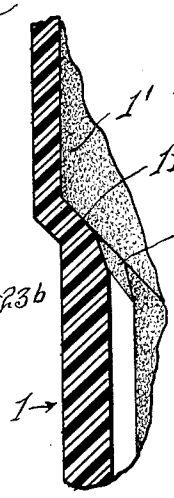


Fig. 12



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Fig. 13

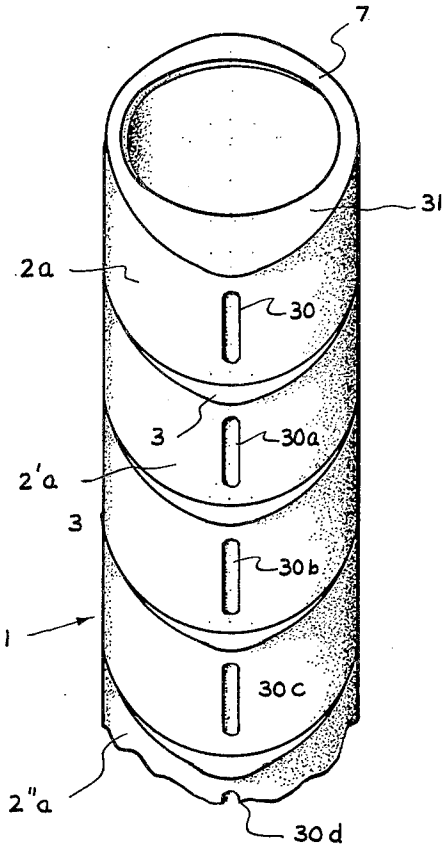
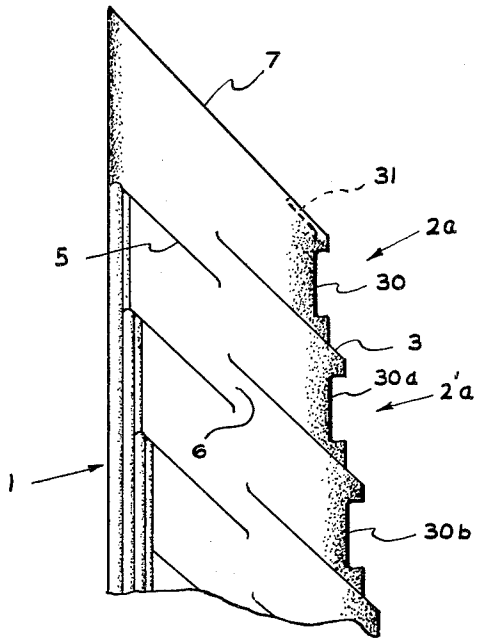


Fig. 14



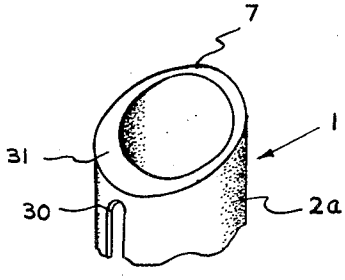


Fig. 15

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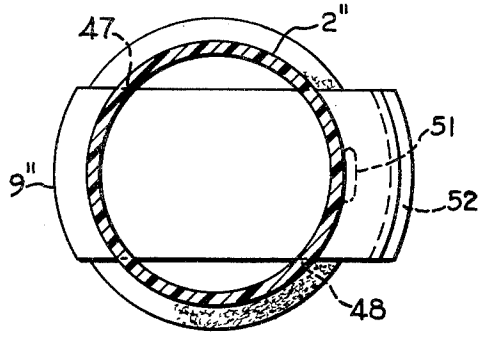


FIG. 18

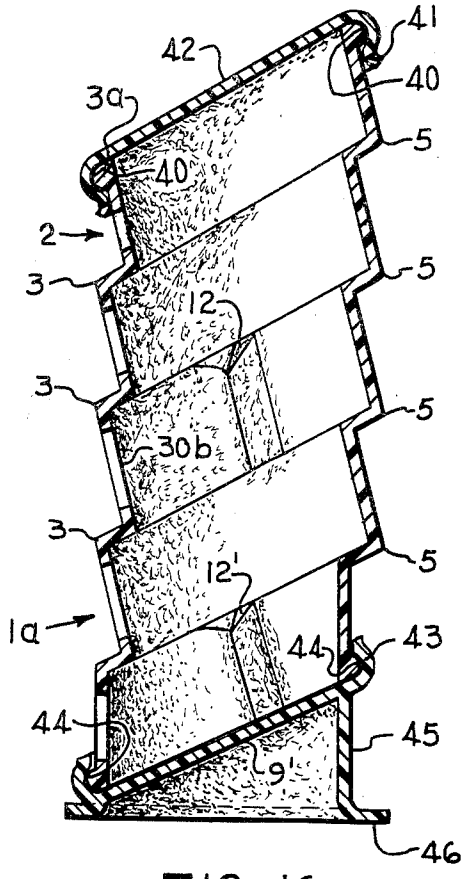


FIG. 16

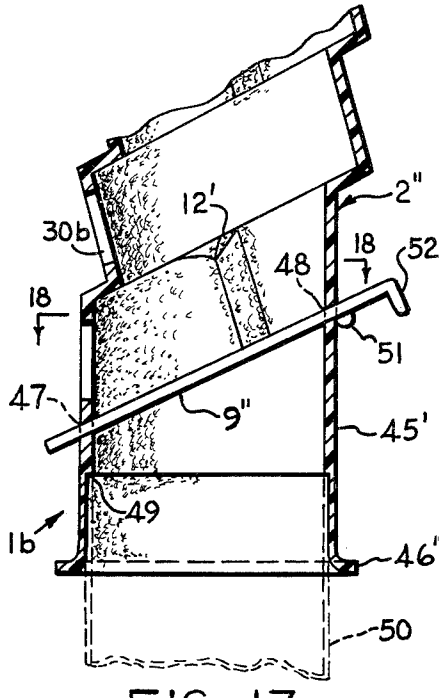


FIG. 17

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United States Patent Office

3,071,243

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3,071,243

VERTICAL COIN COUNTING TUBE

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Filed Dec. 20, 1961, Ser. No. 161,778

9 Claims. (Cl. 206—.84)

This invention deals with a vertical counting tube for coins. More specifically, it relates to a vertical coin counting tube having stepped sections and interiorly disposed staggered ledges for limiting entry, into each section, of coins in excess of the counted number.

There have been disclosed in the art numerous counting trays in which coins are to be laid on their edges and counted by stacking in these trays. Unfortunately, such trays are bulky and difficult to handle so that their use in buses, for example, has never been undertaken. Demand has arisen for a vertical counting device of a simple type, but there has been no success in developing such a unit.

The object of the present invention is to provide such a device which will count coins accurately in the vertical direction and which can be made cheaply and which can be used without any complicated manual or mechanical operations. The invention will be more readily understood by reference to the accompanying drawings in which a preferred embodiment is described. In these drawings, FIGURE 1 illustrates a back view of the counting tube while a side view thereof is depicted in FIGURE 2. A vertical cross-sectional view showing the interior of the back portion of the tube of FIGURES 1 and 2 is presented in FIGURE 3. FIGURE 4 shows a similar view of the interior front portion thereof. A top view thereof is illustrated in FIGURE 5. A cross-sectional side view of the tube of FIGURE 2 is shown in FIGURE 6 while FIGURE 7 depicts the same view when the tube is filled with coins. FIGURE 8 presents a schematic top view of the tube showing that the coin must be tilted to be inserted therein. A schematic phantom front view of the tube is shown in FIGURE 9 to illustrate the manner of stacking the coins therein. FIGURES 10, 11 and 12 depict enlarged cross-sectional views of portions of the tube, i.e., the top ledge portion, and side ledge portions, respectively, thereof. FIGURE 13 depicts a front view of a tube similar to that in FIGURES 1–12, with the exception that it is provided with vertically disposed slots in each section. A side view of the upper portion of the tube of FIGURE 13 is illustrated in FIGURE 14, while FIGURE 15 is a perspective top view of the upper part of the tube of FIGURES 13–14, showing the inner lip terminating the upper section. FIGURE 16 depicts a side elevational cross-sectional view of another modification of a tube wherein the top edge lip is eliminated and wherein the bottom portion is in the form of a cap and a cap is provided as a cover. FIGURE 17 presents a similar view of the bottom portion of another modification of tube wherein a sliding bottom enables emptying of the coins into a wrapper. A top cross-sectional view along line 18—18 of FIGURE 17 is shown in FIGURE 18. Similar numerals refer to similar parts in the various views.

Referring again to the drawings, numeral 1 designates generally a counting tube of the present invention having sections 2, 2', 2'', etc., each successive section being stepped incrementally forward from the one above (FIG. 2). Since backs 5 of the steps define the rear boundary, and steps 3 the front boundary of each section the two boundaries are separated at the sides at 6 by a distance equal to the wall thickness (FIG. 6) of the tube. Each section 2, 2', 2'', etc., has a height such as to contain a counted number of coins, preferably not over 5. Since the stepwise design would tend to make tube 1 unstable as to balance, a vertical balancing fin 4 is provided to enable tube 1 to rest stably on its bottom edge 8.

Coin bottom 9 (on which the first coin 23'' falls) is slanted at a sharp angle, (FIG. 7) such as an angle of 45°, and all sections 2, 2', 2'', etc., are slanted so that their boundary edges 24 (FIG. 6) are parallel to bottom 9. These slanted sections of tube 1 are of such height that the loss in thickness of coins (as compared to newly minted coins) in each stepped section is less than the thickness of an average (run-of-the-mill) coin. Thus, as will be outlined further, such stepping at these intervals in the slanted stack of coins "absorbs" the thickness loss for each section, whereby additive accumulation of thickness loss is avoided, provided means are present to place each first coin of the next superimposed section in its proper position. "Thickness loss" is defined here as the loss in thickness suffered by the coin during use since coinage. It has been found that, even with such stepped section arrangement, extra coins (i.e., those over the counted number intended to be contained per section) will fill in the free space provided by "thickness loss" of the already-stacked coins, resulting in an inaccurate count of the coin stack. In accordance with the present invention, novel staggered ledge means are provided at the section junctions to alternately tilt the stacks in opposite directions, to guide the coins into their respective stacks, to prevent entry of extra coins into the free space, and to shift the first coin into its new position as soon as one stack is accurately filled, whereby an accurately-counted tubeful of coins is made available, without jamming, for packaging or wrapping, when discharged by mere inversion of the tube.

Boundaries 24 of the interior section 2' (i.e., those sections bounded by top section 2 and bottom section 2'', are provided with projecting ledges 11, 12, 11', 12' (FIG. 3), which ledges also are slanted to be parallel to bottom 9, or are even more slanted. These ledges, which are disposed at the section boundaries and are thus substantially parallel to each other at their outer boundaries 24, extend practically around the entire rear half of tube 1. The uppermost ledge 24 begins to emerge gradually from the inner wall at, say 25' (FIG. 3), and then widens to about the center of the rear at, say 26, when it forms a vertical projecting face, say 13, forming an abtuse angle at, say juncture 21'. Thereafter, at a point 17 about halfway from the center of the back to the center of the side, the ledge edge is cut off, preferably in an arc 17. Below this arc, the ledge is cut off in a chamfer 15 which is tilted forwardly at still a greater angle than that of the ledge 11. As to the lower ledges 12, 11' and 12', they are similar to uppermost ledge 24, with the exception that these ledges disappear at the rear of tube 1 into faces 13, 14, 13' and 14'. Also, it will be noted that the positions of ledges 11, 12, etc., are staggered so that the first ledge 12' is disposed at the left and the second ledge 11' at the right, the third ledge 12 at the left, and the fourth 11, at the right. Since the fifth section 1' (FIG. 4) containing coins 23*e* is the uppermost or top section, the ledge therein is omitted and there is provided, instead, a protruding knob or lip 10 designed so that the excess coins will abut flat face 10' of the knob and thus these coins can be readily observed and removed. As a result of this construction, coins 23 (FIG. 9) inserted at an angle into tube 1 will fall therein and, due to the taper and incline of ledges 11, 12, etc., and chamfers 15, 15', 16, 16', they will not be caught on these protrusions, but will fall to the lowest point in the tube. After the bottom section 2' is filled with the counted number of coins 23*a* (say 5 coins), the sixth coin will fall on ledge 12' and the coins in the second stack 23*b* will be tilted downwardly toward the right. After this is filled with the counted 5 coins, the sixth coin will fall on ledge 11'

and the coins 23*c* in that stack will be tilted downwardly toward the left, and so on. Because of this positioning, it will be noted from FIGURE 8 that the tube sections are not circular in cross-section, but are of oval shape, being wider at their sides 1*b* than at their front-to-rear dimension 1*a*.

Thus it will be noticed that the left ledges (e.g., ledge 12) fade off into the back wall on the right, while on the left, they widen out from the back until near the quarter point of the left side wall is reached, whereupon they are cut off to a near-fading into the side wall by being squared off, at say 28'. The edge of the ledge just prior to the cut-off is chamfered, preferably with an arcuate borderline, e.g., 18, the chamfer 15 having a downward slant greater than that of ledge 11. The right ledges (e.g. ledge 11') are generally in image relation to the left ledges, so that they fade into the rear of the tube on the left and, on the right, they have a chamfer, 25', etc.

The tube depicted in FIGURES 13–15 is similiar to the one already described with the exception that vertical slots 30, 30*a*, 30*b*, 30*c* and 30*d* are cut into the front wall of each section 2*a*, 2'*a*, 2''*a*, etc., above steps 3 between the upper sections and, of course, above bottom edge 8 of the lowest section. This enables observation of the coins in all sections and also permits insertion therein of a pencil tip or stylus to loosen any coins which may become jammed.

Also, there is provided in the tube of FIGURES 13–15 a thin lip 31 extending over the lower (front) portion of upper edge 7 of the tube. This lip 31 preferably has an arcuate inner edge, and is used in lieu of the knob 10 in the tube of the preceding figures.

In FIGURE 16, a counting tube 1*a* is shown wherein each section is disposed over the lower section in a manner so that the front and back corners 3 and 5, respectively, are in vertical alignment, so that the tube is more compact laterally and does not require the support or fin 4. Also, there is no lip on the top edge of upper section 2, so that coins in excess over the proper count will slide off edge 3*a* of the front wall. The outer wall of uppermost section 2 also is provided with a bead or shoulder 40 at least partly around section 2 and near edge 3*a* to enable engagement of inwardly-curled flange 41 of cap 42 which is designed to be snapped onto the top of counting tube 1*a* and serve as a cover therefor. Coin bottom 9' of tube 1*a* also may be formed in the shape of a hollow cap having inwardly-curved flange 43 which snaps over shoulder 44 and serve as a cover for the bottom. Downwardly-directed tube extension 45 may be provided with bottom flange 46 to enable standing of tube 1*a* thereon. Thus, it is seen that tube 1*a* may serve both as a counting tube and wrapper and may be sent to the bank in that manner. Or, bottom 9' and its tube extension may be substituted by a cap similar to cap 42. It is, of course, understood, that tube 1*a* would be returned by the bank, or the latter could furnish such tubes and caps to its customers.

In FIGURES 17–18, counting tube 1*b* has a bottom 9'' in the form of a sliding plate which slides through openings 47 and 48 in bottom section 2''*b* of the tube. Section 2''*b* is extended as extension 45' having lower bottom flange 46'. The wall of portion 45' is made thinner at 49 to enable insertion, into the bottom of tube 1*b*, a paper wrapper 50, in which the coins may be wrapped. Sliding bottom 9' may be provided with stop 51 and handle 52.

When in use, the tube is held vertically or placed on its bottom 8. Coins are inserted into top 7 in tilted position, the first coin landing on slanted coin bottom 9. When the counted number (say 5) of coins 23*a* has filled section 2'', the sixth coin 23' will fall on ledge 12' which is disposed to the left of the center of the tube, but in the rear half thereof. This is due to the fact that the edge of an excess coin will hit section boundary protruding edge 3*a* and the opposite edge of the coin will fall on ledge 12' which positions the coin for the next counted coin section, and so on. The alternating tilting of the stacks caused by staggering of the ledges avoids excessive build-up of angularity, i.e., it tends to minimize the increase in vertical slant of upper coins 23 over the lower coins 23'' and also effects better positioning in the accurate filling of the sections.

When the tube is entirely filled with coins, the addition of an extra coin in the upper section 2*a* of the tube will cause the coin to fall on lip 31 which thus will present entry into that section.

After the tube is filled with coins, as shown in FIGURE 7, it is inverted and the coins are poured into a wrapper in accurately-counted condition. The other tubes shown in the drawings are handled in a similar manner, except as modified by the changes indicated.

This application is a continuation-in-part of copending application Serial No. 96,344 filed on March 8, 1961, by Robert T. Allen, and now abandoned.

I claim:

1. A coin-counting tube comprising a vertical layer of hollow, parallel sections including top and bottom sections, disposed in forwardly- and downwardly-slanted and superimposed relation to each other, a flat coin bottom for the bottom section similarly slanted in said tube and to the same degree, the height of each section being such that the loss in thickness of the coins therein is less than the thickness of a run-of-the-mill coin, a downwardly-slanted ledge protruding inwardly from the upper inner back boundary of each section excepting the top section, said ledge being disposed in staggered relation to the next succeeding ledge approximately half-way between the back and side centers in a manner such that extra coins of an upper section will fall thereon and be tilted in a direction opposite to that of the coins in the lower section, and a lip protruding inwardly from the front wall at the top of the top section designed so that extra coins of that section will be positioned out of said tube.

2. A coin-counting tube comprising a vertical layer of hollow, parallel sections, including top and bottom sections, disposed in forwardly- and downwardly-slanted and superimposed relation to each other, a flat coin bottom for the bottom section similarly slanted in said tube and to the same degree, the height of each section being such that the loss in thickness of the coins therein is less than the thickness of a run-of-the-mill coin, a downwardly-slanted ledge protruding inwardly from the upper inner back boundary of each section excepting the top section, said ledge being designed to terminate at the center of the back of the tube and extend to a point near the middle of the tube side, and then sharply retract into the tube side wall, said ledge being disposed in staggered relation to the next succeeding ledge so that extra coins of a higher section will fall thereon and be tilted in a direction opposite to that of the coins in the lower section, and a lip protruding inwardly from the front wall at the top of the top section designed so that extra coins of that section will be positioned out of said tube.

3. A coin-counting tube comprising a vertical layer of hollow, parallel sections, including top and bottom sections, disposed in a forwardly- and downwardly-slanted and superimposed relation to each other, a flat coin bottom for the bottom section similarly slanted in said tube and to the same degree, the height of each section being such that the loss in thickness of the coins therein is less than the thickness of a run-of-the-mill coin, a downwardly-slanted ledge protruding inwardly from the upper inner back boundary of each section excepting the top section, said ledge being designed to terminate laterally into the inner wall at the center of the tube and to extend laterally to near the center of the tube side, and then sharply retracting at this point into the tube side wall, a chamfer at said point having a slant greater than that of the ledge, said ledge being disposed in staggered relation to the next succeeding ledge so that extra coins of a

higher section will fall thereon and be tilted in a direction opposite to that of the coins in the lower section, and a thin lip protruding inwardly from the front wall at the top of the top section, said lip being designed so that extra coins of that section will be positioned out of said tube.

4. A coin-counting tube comprising a vertical layer of hollow, parallel sections, including top and bottom sections, disposed in forwardly- and downwardly-slanted and incrementally-stepped relation to each other, a flat coin bottom for the bottom section similarly slanted in said tube and to the same degree, the height of each section being such that the loss in thickness of the coins therein is less than the thickness of a run-of-the-mill coin, a downwardly-slanted ledge protruding inwardly from the upper inner back boundary of each section excepting the top section, said ledge being designed to terminate laterally into the inner wall at the center of the tube and to extend laterally to near the center of the tube side, and then sharply retracting at this point into the tube side wall, a chamfer at said point having a slant greater than that of the ledge, said ledge being disposed in staggered relation to the next succeeding ledge so that extra coins of a higher section will fall thereon and be tilted in a direction opposite to that of the coins in the lower section, a thin lip protruding inwardly from the front wall at the top of the top section and designed so that extra coins of that section will be positioned out of said tube, and a vertically-disposed slot cut through the wall of each section to permit lateral insertion into the section of a stylus.

5. A coin-counting tube comprising a vertical layer of hollow, parallel sections including upper and bottom sections, the upper sections being disposed in forwardly- and downwardly-slanted and superimposed relation to each other, a flat coin bottom for the bottom section similarly slanted in said tube and to the same degree, the height of each section being such that the loss in thickness of the coins therein is less than the thickness of a run-of-the-mill coin, and ledge means protruding inwardly from approximately the upper inner back boundary of the side of each section excepting the upper most section, said ledge means being disposed in staggered relation to the next succeeding ledge means in a manner such that extra coins of an upper section will fall thereon and be tilted in a direction opposite to that of the coins in the lower section.

6. A coin-counting tube according to claim 5 in which the walls of the upper-most and bottom sections have a bead near their respective edges, and a cap adaptable to be snapped onto each bead and serving as a top and as a bottom for the respective sections.

7. A coin-counting tube according to claim 5 in which the bottom is a sliding plate, and slots disposed in the wall of the bottom section and designed to accommodate said plate.

8. A coin-counting tube comprising a vertical layer of hollow, parallel sections including upper and bottom sections, the upper sections being disposed in forwardly- and downwardly-slanted and superimposed relation to each other and having the outermost edge of each section disposed in vertical alignment with that of each succeeding section, a flat coin bottom for the bottom section similarly slanted in said tube and to the same degree, the height of each section being such that the loss in thickness of coins therein is less than the thickness of a run-of-the-mill coin, and ledge means protruding inwardly from approximately the upper inner back boundary of the side of each section excepting the uppermost section, said ledge means being disposed in staggered relation to the next succeeding ledge means in a manner such that extra coins of an upper section will fall thereon and be tilted in a direction opposite to that of the coins in the lower setion.

9. A coin-counting tube according to claim 8 in which the inner diameter of at least a part of the bottom portion below the bottom of said bottom section is widened to accommodate a wrapping tube.

No references cited.