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MAY 11, 1943.
BY A. P. C.

E. REIS
COIN COUNTING DEVICE
Filed May 31, 1940

Serial No.
338,135
2 Sheets-Sheet 1

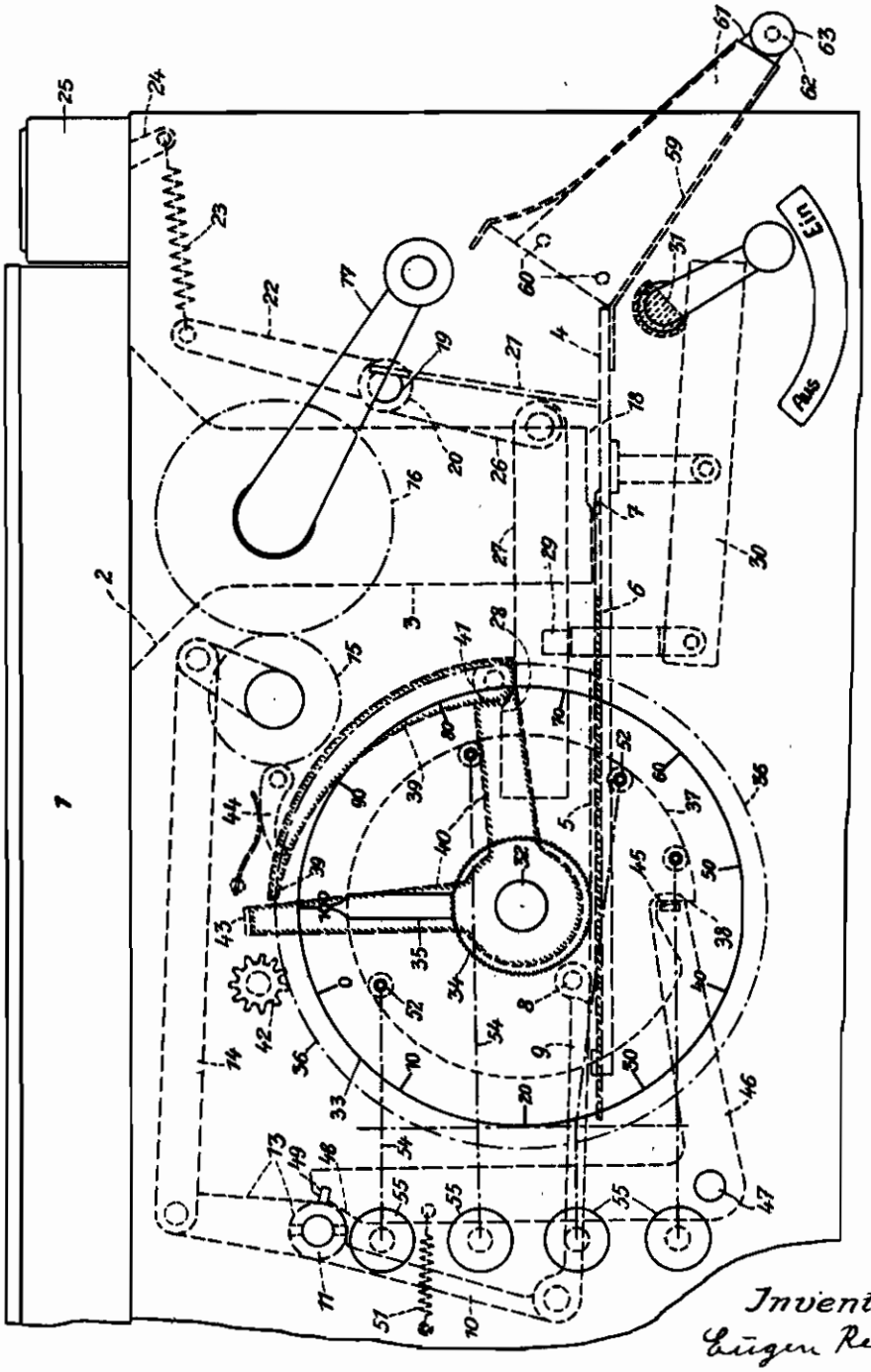

Fig. 1.

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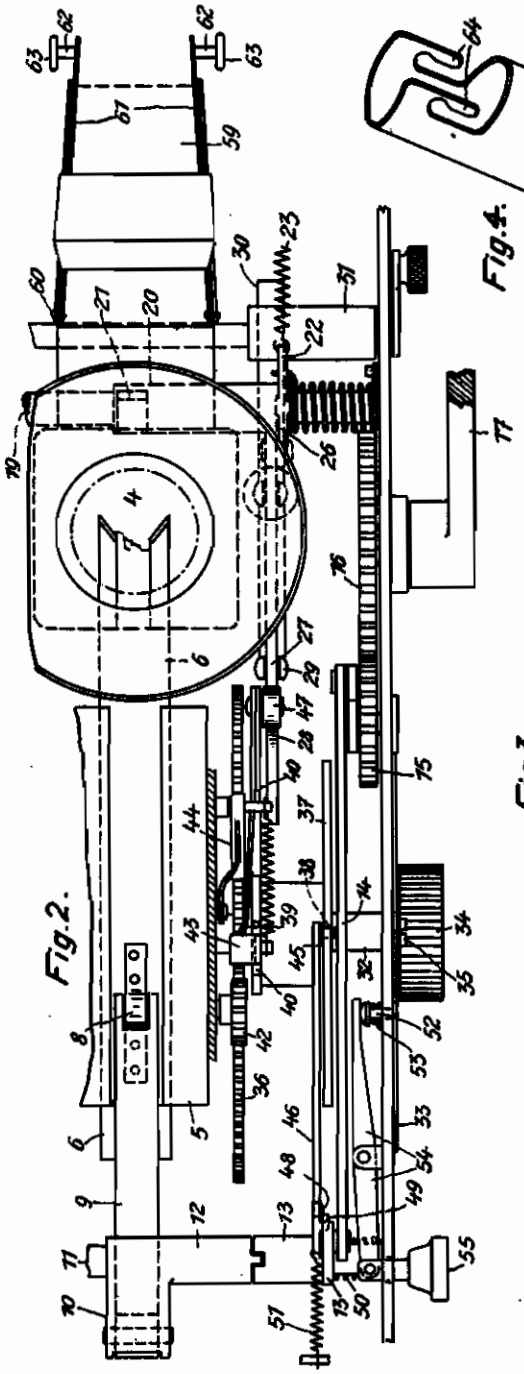

Fig.2.

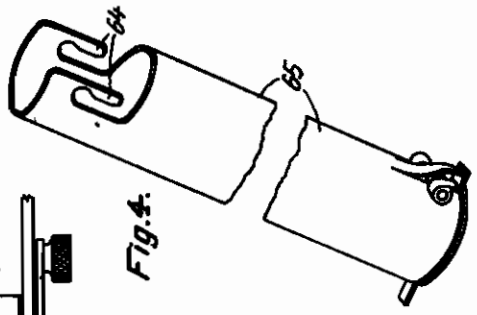

Fig.4.

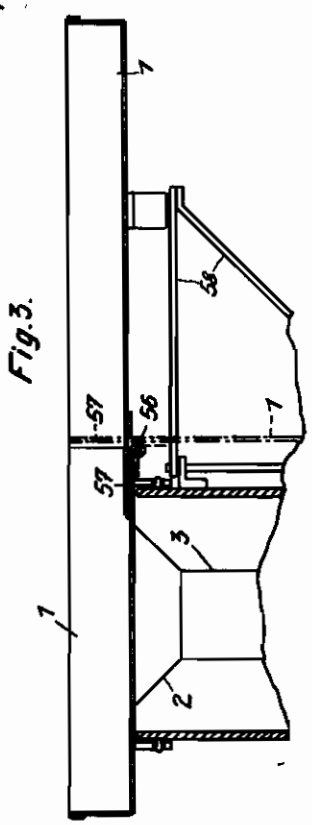

Fig.3.

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ALIEN PROPERTY CUSTODIAN

COIN COUNTING DEVICE

Eugen Reis, Bruchsal, Baden, Germany; vested in the Alien Property Custodian

Application filed May 31, 1940

This invention relates to a coin counting device of the type in which the coin that is the lowermost at the time being of a pile of coins guided in a vertical tube is shoved away by a horizontally moved slide, this movement being then utilised for counting the coins individually, as well as collectively. Concerning counting devices of this type it has already been suggested to lift a vertically guided lever resting with a roll upon a sliding guide path for the coins by as much as corresponds to the thickness of the individual coins concerned. As, for instance, the thickness of a 1-Pfennig-piece amounts only to 1,1 mm, the stroke of the driving lever is only very small, which necessitates the provision of correspondingly large ratios of transmission in order to obtain at the counting device motion-transmitting ways of the requisite length. Considering the unavoidable backlash, or lost motion, in the ratio rods the slight driving stroke mentioned entails easily disturbances and faulty connections of the transmitting members. As with such a counting device also 5-Mark-pieces are to be counted, the thickness of which is more than double the thickness of the 1-Pfenning-pieces, it is necessary to insert into the ratio-rods for actuating the counting members proper a backlash of more than half the total path. This is effected by means of helical springs which, owing to their easy slackening, do not respond sufficiently reliably to the slight "Pfennig-stroke," and operate the counting mechanism either not at all or only insufficiently.

The present improved coin counting device obviates the above mentioned drawbacks on principle by determining the length of the stroke of the lever mentioned not according to the thickness of the coins concerned, but according to the diameter of the same, the length of the stroke, as regards, for instance, a Pfennig, amounting, therefore, not to 1,1 mm, but to 17 mm which are, thus, available for said lever. The system of piling the coins in a vertical tube and withdrawing them singly from the lower end thereof is upheld, the only requirement being to provide in front of the delivery slot of said tube a member movable parallel to the path of the coins and transmitting motion to the counting mechanism.

If said member is a spring-actuated lever which is rotatory supported on an axle located above the above-mentioned slot and extends with its free lower end into the coin feed path, the further advantage will be obtained that, irrespective of the different diameters of the coins, the length of way of said free lever end will be nearly always the same, because the end can be so adjusted that it, after having covered a way of about 15 mm, slides off from the frontal edge of the respective coin and now presses upon the upper surfaces of the same. According to the different thicknesses of the coins the just mentioned action takes place, it is true, also somewhat differently, but the difference between the feed as regards a Pfennig-piece and the feed as regards a 5-Mark-piece amounts, if the minimum length of the stroke amounts to about 15 mm, only to from 2 to 3 mm. The differences between the lengths of the strokes can, therefore, be rendered extraordinarily uniform.

The driving system designed according to this invention entails the useful effect that only a few levers with normal ratio proportions become requisite. The summing-up counting mechanism, for instance, can be actuated directly from the rotary axle of the driving feed lever by means of a simple lever, and in the same manner the counting mechanism for individual countings can be actuated merely by the intermediary of a longitudinal feed member. The low number of the levers reduces considerably the total play of the device and the acceleration of the masses so that a higher number of revolutions is made possible.

The invention is illustrated diagrammatically and by way of example on the accompanying drawings on which Figure 1 is a side-view of the complete arrangement of the new system of levers, Figure 2 is a part-plan pertaining to Fig. 1, and the Figures 3 and 4 show details also fully dealt with hereinafter.

On the drawings, *d* (Fig. 1) denotes the counting table upon which the coins are shed in disorderly state and are shoved towards the hopper **2** (Fig. 3) of the vertical tube **3** in which the coins form automatically a pile. The lowermost coin rests upon the guide member **4** upon which the slide **6** is movable between lateral guide ledges **5**. The slide is forked at its front end and the end portions **7** of the fork are sloped inwardly so that the coin which the fork has seized is automatically centered. The slide **6** is accurately as thick as an 1-Pfennig-piece. At its rear end the slide is connected up to a bar **9** which is moved to and fro by a rocking member **10** moved by a rotary axle **11** supported in the frame of the device. The rocking member is connected with a coupling sleeve **12** easily turnable upon the axle **11**, and a similar coupling sleeve **13** adapted to be coupled with the sleeve **11** is likewise sup-

ported on said axle and firmly connected with a crank-arm 13' that can be reciprocated by means of a manually operable crank 17, a gearing 15, 16 and a connecting rod 14.

At the side of the coin piling tube and above the coin delivering slot 18 thereof is an axle 19 firmly supported in the frame of the device; this axle supports, in turn, a sleeve 20 to which a steel-spring 21 is affixed. The lower end of this spring is situated in front of the delivery slot 18 just in the middle of the path on which the coins are sliding along. Attached to the sleeve 20 is, furthermore, the lever 22, the upper end of which is connected with the operating lever 24 of the collectively counting mechanism 25 by the helical spring 23. The sleeve 20 is also connected with a lever 26, to the lower end of which is hinged a shoving member 27 having a lifting step 28 and being slidably supported upon a forked member 29 guided vertically with respect to the bottom of the device and being held by a lever 30. The left-hand end of the shoving member 27 with the lifting step situated above it can be lowered by turning the cam 31 so that the shoving member is disengaged from the counting mechanism for individual coins. This mechanism is composed as follows:

The axle 32 is surrounded with a dial 33 bearing the numerals 1–100, there being left, however, between the numerals 0 and 100 a free space, by which the dead play for the re-engagement of the automatic locking member for the engagement gear is bridged. There is provided on the outwardly projecting end of the axle 32 an adjusting knob 34 to which a pointer or hand 35 is attached, and inside of the apparatus are firmly secured to the axle 32 the toothed stepwise movable wheel 36, the number of the teeth of which corresponds with the subdivision of the dial, and the stepwise movable disk 37, having in its rim a tooth-like recess 38, the position of which in the system corresponds with the adjustment of the hand 35 relatively to the numeral "100" on the dial. Turning the wheel 36 intermittently by as much as corresponds to one tooth is effected by an elastic pawl 39 consisting of steel and engaging the teeth of said wheel laterally. The pawl 39 has the shape of a quadrant bearing at its upper end the adjusting tooth co-operating with the wheel 36 and engaging the teeth thereof elastically, as has already been mentioned, whereas the lower end of said pawl is firmly attached to a bell-crank lever 40 easily rotatable supported upon the axle 32 of the pointer. Where the lever 40 joins the elastic adjusting pawl 39, there is arranged an easily turnable roll 41 which can be pressed upwardly by the lifting step 28 of the shoving member 27. When this takes place, the pawl 39 turns the wheel 32 forward by as much as one tooth (in counter-clockwise direction), and simultaneously therewith the pinion 42 easily rotatably supported upon an axle supported, in turn, in the frame of the device is turned because it continually meshes with the teeth of the wheel 32. The pinion 42 engages, at the end of the "one-tooth" adjusting movement, the angularly bent end 45 of the other arm of the bell-crank lever 40 and locks thereby the pinion and the stepwise movable wheel 32 which meshes therewith so as to prevent it from being further rotated by centrifugal action or the like. A ratchet pawl 44 prevents the wheel 32 from being turned in counter-direction. When the adjusting procedure has been finished and the shoving member has returned into the position shown in Fig. 1, a helical spring (Fig. 2) arranged between the upper end of the bell-crank lever 40 and the stationary supporting pivot of the ratchet pawl 44 withdraws said lever 40 and with it also the elastic adjusting pawl 39 back into the starting position shown in the drawings.

On the circumference of the stepwise movable disk 37 slides continually a nose 45 provided at the end of the lower arm of a bell-crank lever 46 supported upon a stationary axle 47 and having at its upper arm an oblique face 48 which presses, on the further rotation of the coupling sleeve 13, the pin 49 situated on this sleeve back, counter to the action of the helical spring 50 (Fig. 1), when the nose 45 enters into the tooth-like recess 38 at the circumference of the disk 37, whereby the two coupling sleeves are separated from one another. As this procedure can take place only when the pointer 35 has arrived at the numeral 100 on the dial, this occurrence means that the automatic disengagement is established with the end, at the time being, of the counting procedure. This manner of effecting the disengagement presents the advantage that the disengagement of the drive takes place free of shocks in that the manually operable crank 17 can be further turned without entailing any effect. The bell-crank lever is, on the one hand, continually drawn by the helical spring 51 into the position in which the uncoupling of the drive is effected, it is true, but on the other hand, it is likewise continually prevented from exerting that effect by the nose 45 bearing continually upon the rim of the disk 37 which is free from teeth on all other portions of its circumference, the end-position "100" constituting, however, an exception as regards the action of the pinion 42 upon the annularly bent end 43 at the other arm of the bell-crank lever 46.

The above described counting device for individual coins permits a selective adjustment in the range from 0 to 100, in that prior to the commencement of the counting procedure the hand 35 is adjusted to that numeral of the dial, the difference of which with respect to the numeral 100 corresponds with the desired quantity to be counted. In order to facilitate this adjustment as regards the most customary part-countings, and also to obviate errors in the adjustment, abutment members 52 are provided which can be pressed out of the plane of the dial so as to block the path of the hand or pointer. These abutments 52 are normally retained by springs 53 so that they not project over said plane, but they can be manually shoved outwardly temporarily by means of keys 54 by the intermediary of levers 54 until the hand or pointer has been adjusted.

Fig. 3 shows separately a transverse section through the coin table 1. The left-hand portion of this table is situated above the counting mechanism, whereas the right-hand portion of said table can be turned downwardly around the hinge 56. Simultaneously therewith that part of the downwardly movable portion of the table which extends above the hinge is upwardly turned so that a rim 57 is formed which again surrounds the remaining portion of the table. This arrangement renders, therefore, possible not only a reduction of the space requisite for the device during transport, but also while the device is used for smaller amounts of coins, as in this case the remaining smaller portion of the table can be fully utilised owing to the existance of the above

mentioned complete rim. The members **58** provided for supporting the upwardly turned portion of the table are laterally turnable.

The coins shoved forwards by the slide **6** slide along the sliding path **59** below the elastic lever **21** after they have acted upon this latter in the manner above described. At the lateral walls of said path springs **61** joining said walls yieldingly are provided at the places **60**, and at the lower end of each of said springs is an outwardly directed pin **62** provided with a grip **63**. The springs **61** can be inwardly moved towards one another counter to the action of their elasticity in order to allow of suspending from them the coin collecting tube **65** which is provided for this purpose with eyes **64**, as shown in Fig. 4. The range of elasticity of the springs **51** is large enough to permit the selective suspension of collecting tubes for coins of various diameter. As the springs form at the same time lateral walls, an automatically centered feed of the coins to the small, as well as to the large collecting tube is obtained whereby a secure introduction of the coins into said tubes is warranted.

EUGEN REIS.