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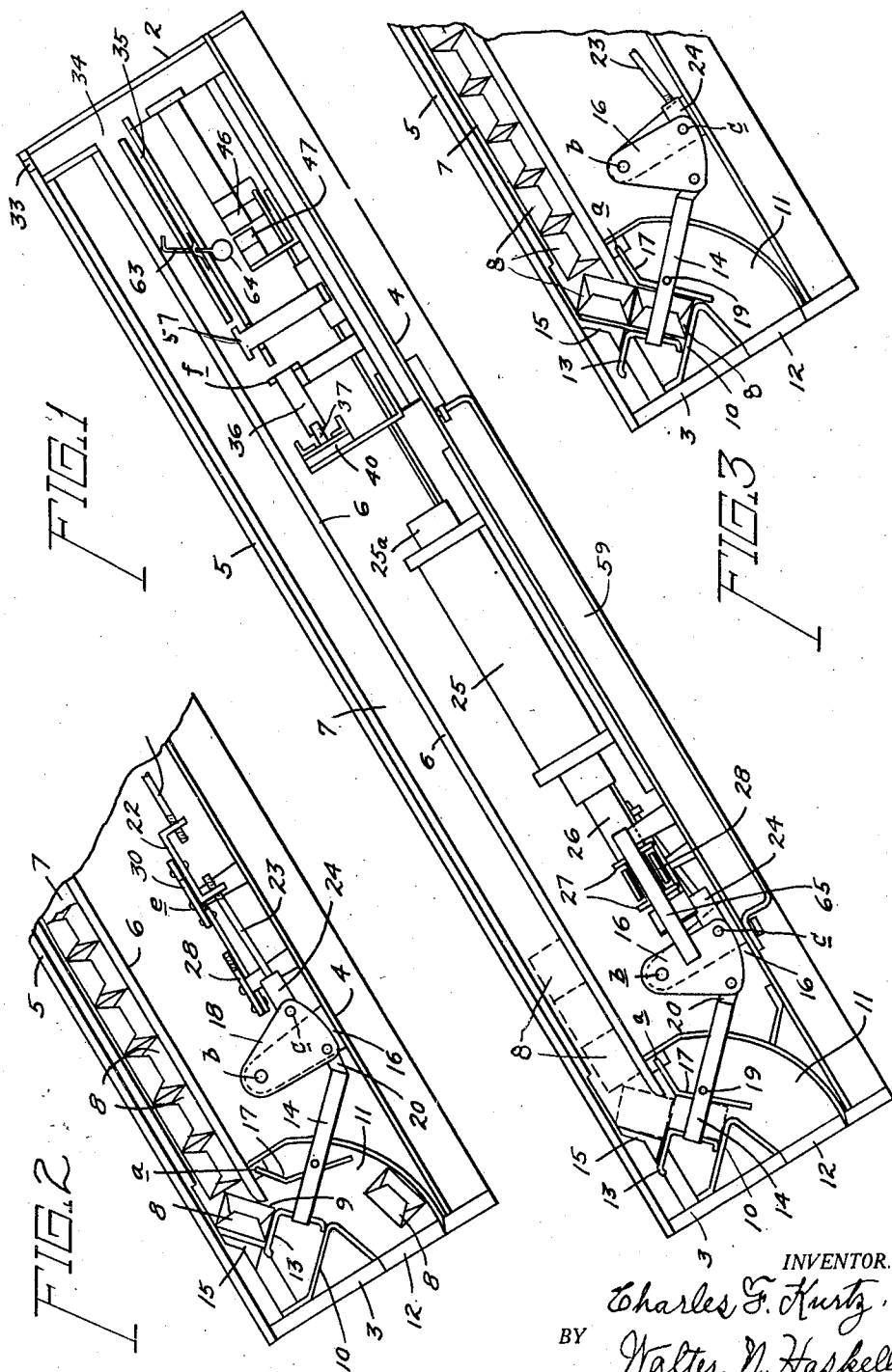
C. F. KURTZ

1,732,272

COIN OPERATED VENDING MACHINE

Filed Nov. 11, 1927

3 Sheets-Sheet 1



INVENTOR.
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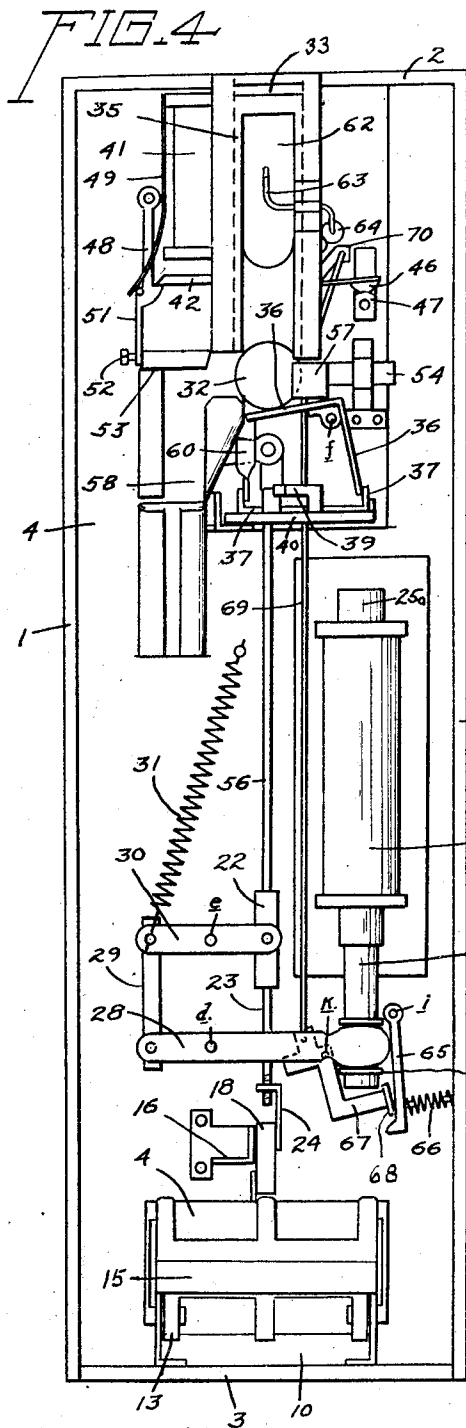
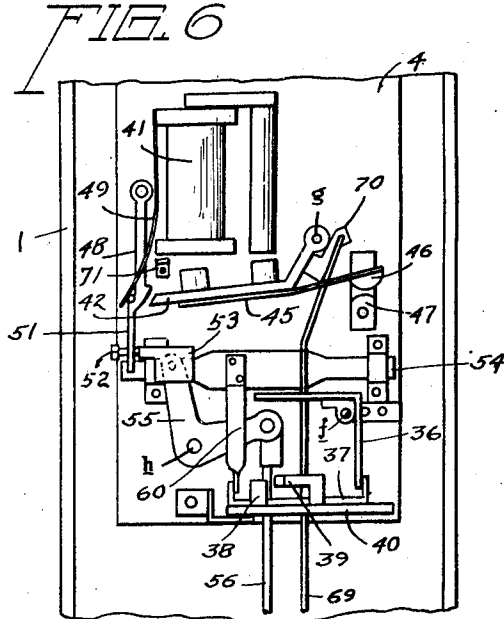
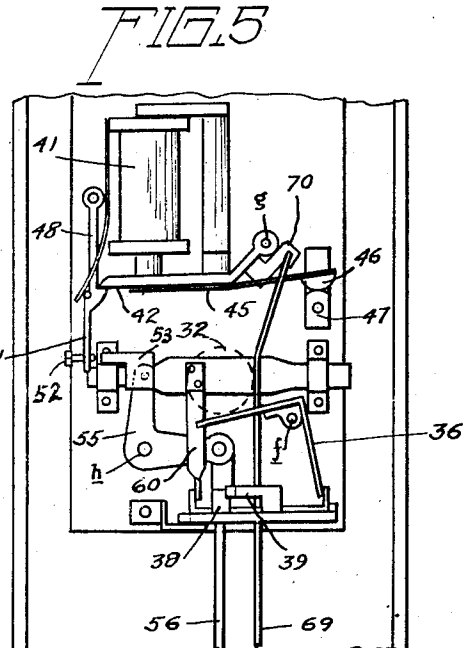
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3 Sheets-Sheet 2



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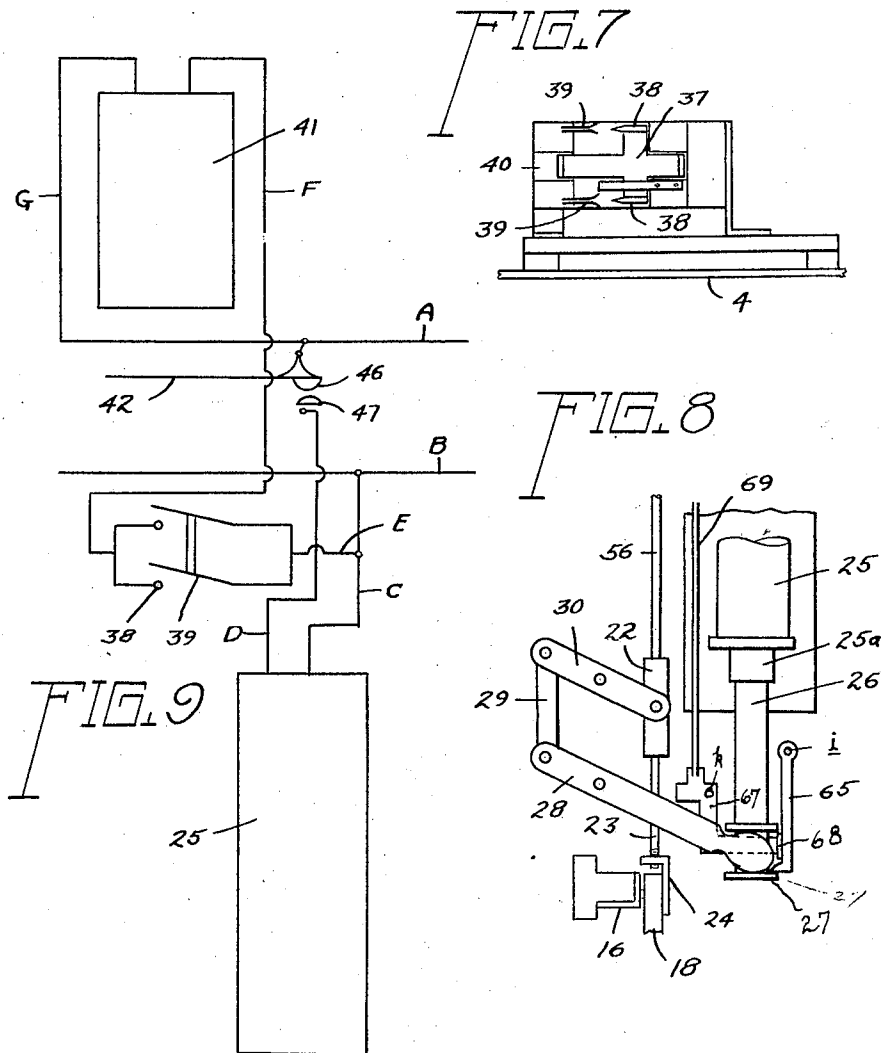
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COIN OPERATED VENDING MACHINE

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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

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COIN-OPERATED VENDING MACHINE

Application filed November 11, 1927. Serial No. 232,522.

My invention has reference to a coin operated vending machine, of that type which is set forth in an application for Letters Patent of the United States filed by myself on the twenty-first day of March, 1927, Serial No. 176,931. In this class of machines a series of packages is supported on an inclined plane, in such manner as to feed automatically towards a discharge opening, and in some cases the column of packages will bear against the lowermost package with sufficient force to interfere with the operation of the mechanism designed to assist in the release and discharge of such package. One of the purposes of the present invention is to provide a novel receiving and releasing apparatus which will not be affected by the pressure of the packages in the inclined slide, and which will operate efficiently in the discharge of successive packages from the machine.

Another purpose of the invention is to provide mechanism for the release of the first of a series of parcels which will cause a positive discharge thereof, and which will act as a bar to the next succeeding package in the column. In connection with this mechanism is a movable guard which will interfere with the surreptitious removal of the packages.

The above named and other features and advantages of the invention will more fully appear from the following specification, reference being had to the accompanying drawings, in which:

Fig. 1 shows the invention in side elevation, with one of the sides of the casing removed.

Fig. 2 is a fragmentary view of the lower end thereof, showing the discharge mechanism in operated position.

Fig. 3 is a similar view, with said mechanism in a normal position.

Fig. 4 is a plan view of the invention with the partition 6 removed.

Fig. 5 is a detail of the primary switch mechanism, with the switch closed.

Fig. 6 is a similar view with the switch open.

Fig. 7 is a face view of the primary switch devices.

Fig. 8 is a detail of the catch mechanism for holding the plunger 26 from movement.

Fig. 9 is a diagrammatic view of the electrical connections made use of in actuating the device.

The invention is shown and set forth herein in its simple or unitary form, but two or more units can be combined in a multiple form of the device, if desired, said units being enclosed within a casing of suitable size, and used for dispensing different kinds of confections, or for several varieties of the same kind.

As set forth herein, the invention is contained within a casing, comprising a pair of sides 1, ends 2 and 3, a floor 4, and a top 5, preferably of glass. Supported in spaced parallel relation with the top is a partition 6, forming the bottom of a passage or chute 7, of suitable dimensions to contain a series of packages of the kind to be vended by the machine. A number of said packages are indicated at 8, and may consist of rolls of mints or other confections, or packages of gum. The casing is designed to be supported in an inclined position, with a sufficient slope to cause a ready movement of the packages toward a throat 9 at the lower end of the chute, by force of gravity. The lower-most parcel drops into a pocket the bottom of which is formed by an angle-plate 10, below which is a discharge chute 11, leading to an opening 12 in the end 3 of the casing.

Slidable on the upper part of the plate 10 is a plunger 13, to the ends of which are attached the ends of a frame 14, said frame ends being united by a bar passing beneath the bottom of the chute 11. The upper plate of the plunger 13 is slidable beneath an angle-plate 15, one face of which forms one side of the throat 9. Spaced from the plunger is a guard frame 17, swingingly supported as at *a*, said frame forming the inner side of the parcel pocket, when the parts are in a normal position, as shown in Fig. 3. The ends of the guard are engaged by pins 19 in the ends of the frame 14, which hold said guard in its proper relation to the plunger, and prevent surreptitious removal of the lower-most package.

Mounted on the floor 4 in rear of the chute 11 is a support 16, to the upper part of which is pivoted a plate 18, as at *b*. One corner of said plate is connected with the frame 14, by means of a link 20. In line with said plate is a coupling 22, projected from one end of which is a rod 23, connected by a link 24 with the opposite corner of the plate 18, as at *c*. Secured on one side of the floor 4 is a solenoid 25, containing a cylinder 25^a, in which is slidable a bar plunger 26. On the outer end of said plunger is a collar 27, engaged by a fork on the end of a lever 28, fulcrumed on a bearing on the floor 4, as at *d*. The free end of the lever 28 is connected by a link 29 with a lever 30, fulcrumed at *e*, and pivotally connected with the coupling 22. Said levers are held in a normal position, with the plunger 26 extended, by means of a coiled spring 31.

Upon the solenoid 25 being electrically charged the plunger 26 is drawn inwardly, rocking the levers 28 and 30 in a direction to move the coupling 22 in the same direction as the plunger. The movement of said coupling is imparted through the rod 23 and plate 18 to the frame 14, moving said frame and the plunger 13 downwardly and inwardly. The plunger forces ahead of it the lowermost package, shown contained in the pocket in Fig. 3, the package at the same time moving the guard 17 inwardly, until a passage is cleared, permitting the package to drop into the chute 11, from which it is expelled by its own weight and momentum. In the package expelling movement of the plunger 13 the upper plate thereof closes the throat 9, forming a support and obstruction to the next succeeding package in the column. Upon the plunger being returned to its normal position this package drops into the space between the plunger and guard, ready to be discharged in its turn, while another package is tipped into an inclined position in the throat. This latter package receives the bulk of the pressure exerted by the column of packages in the chute, and the lowermost package is not affected thereby. There is therefore little or no interference with the plunger 13 in its movement for discharging the package.

The end of the cylinder 25^a is preferably closed, a cushion of air therein operating to retard the movement of the plunger 26, and correspondingly prolong the duration of movement of the coupling 22. This will defer the operation of the mechanisms for returning the various devices to a normal position, and give all of said devices ample time in which to operate, as will be hereinafter more fully set forth.

In the upper end of the casing is a coin slot 33, in which a coin of established size and value may be inserted, passing downwardly along a curved passage 34 into a chute 35, at the lower end of which the coin comes in contact with an angle-plate 36, pivotally sup-

ported as at *f*, the coin being indicated at 32. The other arm of said angle-plate is in engagement with a slide-plate 37, carrying a pair of switch terminals 38, adapted for contact with terminals 39 on a frame 40. The contact of the coin with the angle-plate causes a movement of the plate 37, closing the switches and also a circuit through an electrical system in which is contained an electro-magnet 41, in proximity to which is supported an armature 42, pivoted at *g* on a post fixed in the floor 4. Fixed to the armature is a spring 45, on the end of which is a contact 46, normally out of contact with a terminal 47, electrically connected with the solenoid 25. Upon the switch 38—39 being closed and the magnet 41 energized the armature 42 is attracted thereto, causing a contact of the points 46 and 47, and closing a circuit through the solenoid, which operates in the manner hereinbefore set forth.

Upon the armature being attracted toward the magnet 41 the end thereof slides past the nose of the catch 48, which engages such end and locks the armature from release. The action of the catch is impelled by means of a spring 49, which is supported to bear against the catch to hold it yieldably in engaging position. The catch is provided with an extension 51 in the end of which is a set-screw 52, bearing against a block 53 on one end of a bar 54, slidable transversely of the floor 4. Pivoted on the floor as at *h* is a bell-crank lever 55, one of the ends of which is connected by a rod 56 with the coupling 22, and the other end with the slide-bar 54. At the latter part of the movement of the plunger 26 the lever 55 is operated to cause the bar 54 to move in a direction to force the catch 48 outwardly, permitting the return of the armature 42 to an open position. The movement of the bar 54 also causes a push-plate 57 supported thereby to dislodge the coin from the lower part of the chute, forcing it sideways therefrom, and into a discharge chute 58, from which it passes downwardly into a box 59, removably supported beneath the floor 4. The push-plate also blocks the passage of a second coin that might have been introduced into the coin slot, and prevents the same from functioning until the first coin is deposited in the box, and the mechanism re-set for another operation.

The slide-bar 54 also carries an arm 60, the end of which engages a lug on the slide-plate 37, operating the same to release the switches 38—39 coincidentally with the release of the coin, and just preceding the release of the catch 48.

The coin-chute contains a slot 62, of relatively less width than the diameter of the coin it is designed to use for operating the machine. For example, if the established coin is a five cent piece, and a one cent piece is inserted in the slot 33 it will pass through

the slot 62, without affecting the machine. By tipping the machine into a vertical position a coin of any size that will enter the coin slot will drop straight down against the angle-plate 36, and operate the machine. To prevent such operation a wire guard 63 is pivoted at one side of the coin chute, and provided at its outer end with a weight 64. When the casing is supported in a vertical position said weight will swing the guard into position with the bent end thereof projected into the passage way of the coins, so as to intercept the movement of any coin entering the chute. As the casing is returned to an inclined position the weight swings the guard upwardly, permitting the coin to resume its course. If the intercepted coin is one of the regular ones for operating the machine it passes on down the chute into contact with the angle-plate 36. If it is of smaller size it drops through the slot 62 as before mentioned.

To prevent accidental release of a package, such as might be caused by shaking the machine to such an extent as to operate some of the parts, a lock is provided for the plunger 26, consisting of a catch 65, pivoted at *i*, and adapted for engagement with the outer flange of the collar 27 when the plunger is at its extreme outer position, as shown in Fig. 8. This engagement is made positive by means of a coiled spring 66 interposed between said catch and the side of the casing. Near said catch an L-shaped lever 67 is pivoted, as at *h*, said lever having an upwardly turned arm 68, which bears against the inner face of the catch 65. The short arm of said lever is connected by a rod 69 with a plate 70 fixed to the armature 42 so as to project beyond the pivotal point thereof. The initial movement of the armature is thus imparted through the rod 69 and lever 67 to the catch 65 to release the same from engagement with the plunger, and permit the same to function. The timing of the devices is such that the catch is released just preceding the contact of the terminals 46 and 47, by means of which the solenoid is energized. Upon the armature being dis-engaged from the magnet 41 the lever 67 is again moved to withdraw the arm 68 and permit the re-engagement of the catch 65 with the plunger 26 upon its again moving outwardly.

The arrangement of the electrical system is substantially as laid out in Fig. 9, the wires A and B indicating main lines which are connected with a source of electrical energy, not shown in the drawing. From the wire B a wire C extends to the solenoid 25, from which another wire D leads to the terminal 47. From the wire C a wire E leads to the switch points 39, and the terminals 38 are connected by a wire F with the magnet 41. Another wire G leads from said magnet to the

wire A, and the contact 46 is also connected with the last-named wire.

The cycle of operations is as follows:— Upon a coin being inserted in the slot 33 it passes downwardly into contact with the angle-plate 36, closing the switches 38—39, energizing the magnet 41 and operating the armature 42. This releases the catch 65 and closes the points 46 and 47, closing a circuit through the solenoid 25. This results in the operation of the package discharging devices, through the action of the levers 28 and 30. Near the end of the movement of the plunger 26 the slide-bar 54 is actuated to discharge the coin from the coin chute, open the switch 38—39, and release the catch 48, permitting the return of the armature 42 to its original position, which is effected by the force of gravity. Upon the plunger 26 moving outwardly again the rod 56 is again moved forwardly, rocking the lever 55 and returning the slide-bar 54 to an inoperative position. While the complete cycle of movements appears to be performed instantly, there is a brief interval between the several movements which gives a retarding effect thereto, and provides ample time for all of the parts to act in their desired sequence. This is aided by the retarded movement of the plunger 26 before referred to.

The inclined position in which the casing is held not only aids in the movement of the packages therein, but it also places such packages in a convenient position for display.

While the invention has been set forth herein in use for dispensing packages of a smaller type, it may be adapted for the automatic sale of larger packages of a uniform shape and size, such as bread, breakfast foods, coffee, tea, and many others. The size of the machine would have to be correspondingly increased. The machine is found to operate most satisfactorily when the parcel chute is inclined at an angle of approximately forty-five degrees with its support.

What I claim, and desire to secure by Letters Patent, is:

1. In a device of the class described, a casing and chute therein for containing a series of parcels movable therein by gravity, and provided with a suitable discharge opening, a pocket capable of receiving a single parcel at a time from said chute, consisting of a stationary floor, a side movable to expel said parcel from the pocket, a frame connected with said side and capable of a reciprocating movement, and a side movable in parallel relation with said first-named side and serving as a guard to prevent the release of said parcel except in the regular operation of the machine, said frame and said last-named side having connections preventing movement of said side except with said frame and the other side.

2. In a device of the class described, a cas-

ing and inclined passage therein, provided at
its discharge end with a downwardly diverg-
ing throat, a pocket beneath said throat con-
sisting of a stationary floor, a plate slidable
5 on said floor to carry a parcel to a point
beyond the end thereof, and a plate swing-
ingly supported in parallel relation with the
first-named plate, a frame connected with the
slidable plate and capable of a reciprocating
10 movement, and connections between said
frame and said swinging plate, to hold said
plate from movement except upon the oper-
ation of said slidable plate, said connections
permitting an increased spacing between said
15 plates toward the end of the operation, to per-
mit the ready release of a parcel.

In testimony whereof I affix my signature.
CHARLES F. KURTZ.

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