J. C. WARREN.

ICE CHUTE.

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1,153,658. Patented Sept. 14, 1915.

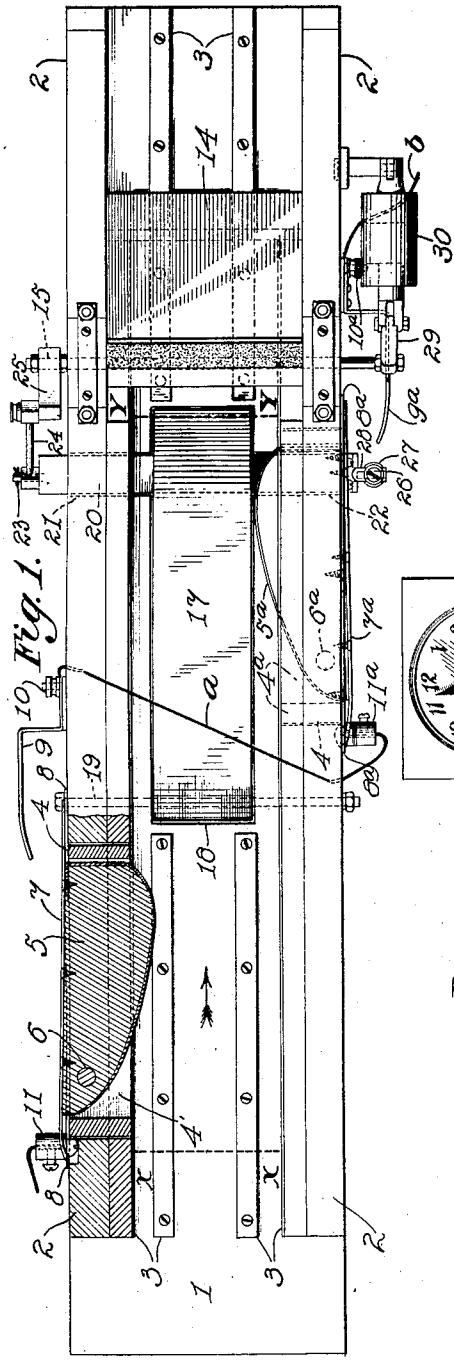


Fig. 1.

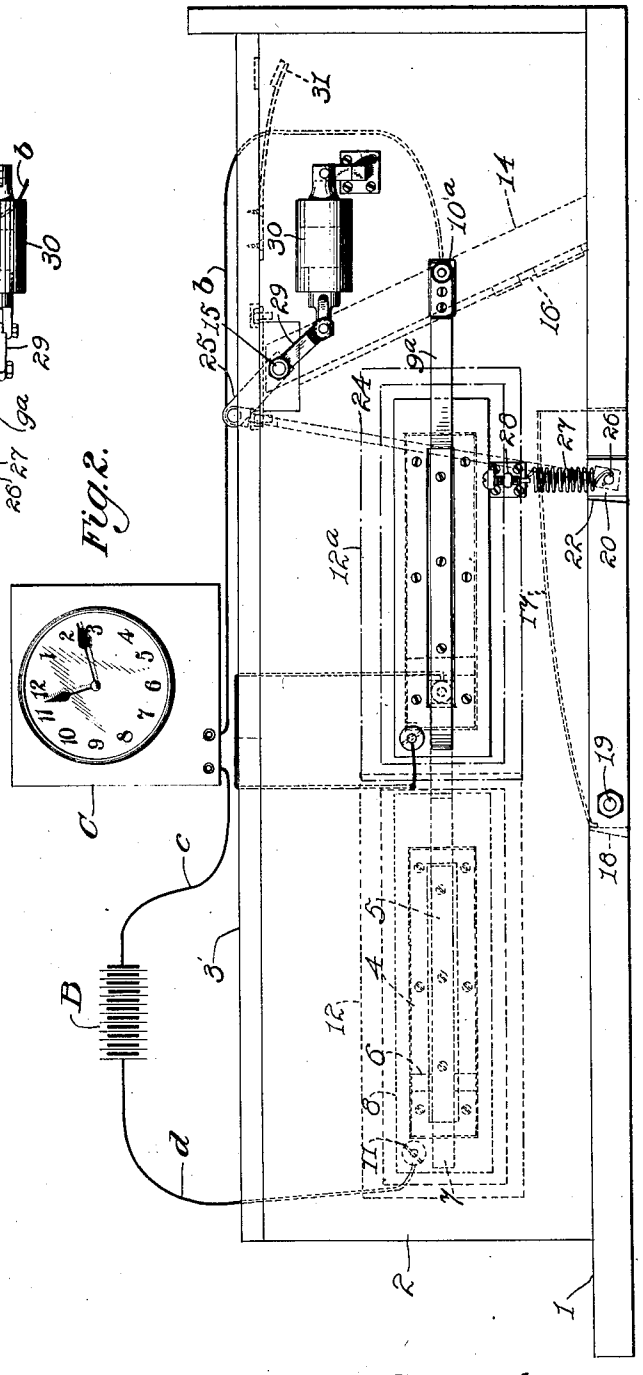


Fig. 2.

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UNITED STATES PATENT OFFICE.

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ICE-CHUTE.

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To all whom it may concern:

Be it known that I, JAMES C. WARREN, citizen of the United States, residing at Emporia, Virginia, have invented certain new and useful Improvements in Ice-Chutes, of which the following is a specification.

The present invention relates to improvements in chutes, and pertains more particularly to inclosed chutes through which large cakes of ice are adapted to be passed from the tanks in which they are made to the storage or ante-room, or to outside delivery platforms.

The invention has among other objects to provide a chute of this type with electrically operated means for accurately registering the successive cakes of ice as they pass through, and also the exact time at which each cake is sent through the chute, making it compulsory for the attendant in charge of operations to harvest the ice at regularly prescribed intervals.

A further object consists in so supporting and arranging the registering means that it will be practically an impossibility for an attendant in charge of the device to tamper with the operating mechanism and so obtain false records of the amount and time at which the ice passes through the chute.

As the ice is being manufactured, it is taken from the containing cans, and in order to maintain the proper temperature the best result is obtained when one cake is removed say at regular predetermined intervals, the length of which being dependent upon the capacity of the plant. Not infrequently the attendant in charge of the ice harvesting withdraws a large number of cakes within a very short time and by immediately refilling the cans the temperature of the tank is materially raised, and the work of the whole system consequently impaired. The present device is intended as a check upon this practice, and records with accuracy each cake as it is removed, and the time at which each one passes through the chute on its way to the storage house making it compulsory for the attendant to remove the block at an absolutely uniform rate.

A further object of the invention consists in an improved form of door and operating mechanism therefor. It is necessary to equip chutes of this type with doors which will effectively prevent the intake of warm air, and yet which can be easily opened to allow the ice to pass therethrough. According to this invention, operating mechanism is provided by which the cake of ice in its travel through the chute opens the door automatically before the ice reaches the point at which the door is hung.

With these and other objects in view, the invention consists in the combination and arrangement of parts hereinafter described and particularly defined by the appended claims.

In the drawings: Figure 1 is a plan view partly in section with the top of the chute removed. Fig. 2 is a side elevation diagrammatically indicating electrical connections from the chute to a time clock.

Referring to the drawings, the chute is of variable dimensions depending upon the size of the cakes to be passed through it and is composed of a floor or base 1 with two vertical sides 2, 2 of suitable material, preferably heavy boarding reinforced with metal wearing strips 3 to protect the surface of the wood from the frictional engagement of the ice, and also to facilitate the sliding of the ice through the chute. A removable cover 3′ is provided, and it will be seen that the chute is of hollow rectangular shape sufficiently larger than the size of an ordinary cake of ice to permit of the same passing easily through it. A rectangular opening is formed in one of the side walls 2 of the chute, and has fitted therein a frame 4 providing a horizontal slot 4′. A horizontal board or plate 5 is pivotally mounted on a pin 6 near the end, and is adapted to move laterally about its pivot within the recess or opening 4′. The outer edge of the plate 5 is normally flush with the outer face of the wall 2 and has fastened thereto a copper strip 7 extending beyond its ends and contacting with a metal face plate 8 surrounding the opening 4′. One end of this metallic strip 7 is bowed or bent out from a point near the end of the plate 5 having its free end in contact with the plate 8. The effect is to produce a leaf spring which will tend normally to keep the edge of the plate 5 flush with the outer face of the wall 2. The other projecting end of the strip 7 acts as a stop to limit the inward movement of the plate 5 and as a contact making device with metal contact 9.

The plate 5 is formed with its inner edge gradually curving outwardly so as to pro-

vide at its widest part an ear-shaped member which extends into the chute proper some distance beyond the inner edge of the wall 2. Suitably secured to the outer face of the wall 2 is a metal contact 9 formed of copper or other conducting material having its free end spaced from the wall 2 and extending in line with the movable free end of the strip 7. This contact 9 is provided with a binding post 10. A similar binding post 11 is provided at the opposite end of the face plate 8, forming an electrical connection with the opposite end of the strip 7. A similar opening 4^a is formed in the opposite wall 2 of the chute at a distance slightly nearer the discharge end of the chute. This opening is also provided with a similar board 5^a pivoted upon a pin 6^a within the opening and provided in duplicate with the parts 7^a, etc. The distance at which the second pivoted board 5^a is spaced from the first board 5 longitudinally of the slot is determined by the length of the cake of ice, the relative position of the two members being such that as a cake of ice is passed through the chute in the direction of the arrow shown in Fig. 1, the two pivoted plates 5 and 5^a will both be pressed outwardly against the action of their springs 7 and 7^a respectively when the cake of ice has assumed the position in its travel indicated by the lines X—X and Y—Y. The binding post 10 of the contact 9 on one side of the chute is connected by the wire *a* to the binding post 11^a on the opposite side of the chute. The binding post 10^a of the contact member 9^a is electrically connected through a wire *b* to an electrically operated time clock C. A wire *c* from the other binding post of the clock C passes to a battery B which, in turn, is connected by the wire *d* to the binding post 11 on the opposite side of the chute. Thus it will be seen that when a cake of ice traveling through the chute in the direction of the arrow has momentarily assumed the position indicated by the line X—X and Y—Y, Fig. 1, the two boards 5 and 5^a are pressed outwardly so that the strips 7 and 7^a are contacting with the conductors 9 and 9^a respectively, and a closed circuit is obtained from the battery through the wire *d*, copper spring 7, contact strip 9, wire *a*, copper strip 7^a, contact strip 9^a, wire *b*, through the clock C, and back through wire *c* to the battery B. The clock mechanism is of any well known type in which a paper dial or disk is continuously rotated as the clockwork moves, and is adapted to be punched by a needle whenever a closed circuit is effected.

From the foregoing it is obvious that in order to complete the circuit and operate the clock mechanism, the plates 5 and 5^a must be pressed outwardly by the cake of ice so as to form contacts at the same time. Although the plate 5 is moved outwardly first, it remains in its depressed position until the second plate 5^a is also pressed outwardly. Thus it would be difficult to tamper with this mechanism in order to bridge both contacts at once, and so fraudulently cause the clock to record. A further precaution against tampering with the mechanism is provided in the form of two covers or casings 12 and 12^a shown in dot and dash line Fig. 2 adapted to be removably secured to the outer walls 2 of the chute and inclose the contact members 9 and 9^a, respectively.

A swinging door 14 pivotally carried on the transverse shaft 15 is provided near the outer end of the chute. The door, when closed, is limited in its inward movement by diagonally disposed shoulders or beads 16 which are insulated and inclined slightly from the vertical. At a suitable distance in advance of the door a pivoted treadle 17 is provided in an opening 18 formed in the floor 1 of the chute. The treadle 17, which is wedge-shaped, is pivotally carried on a transverse rod 19 which passes through its smaller tapered end. Normally the lower face of the treadle 17 is flush with the bottom surface of the floor 1, so that the inclined face of the treadle extends upwardly into the chute in the path of the ice cakes. A transverse member 20 is rigidly secured to the lower edge of the treadle 17 near its forward end, and provides arms extending at right angles thereto which engage in correspondingly formed openings 21 and 22 of the chute floor.

The transverse member 20 extends on either side of the chute a slight distance beyond the walls 2. One end of this member 20 is provided with a pin 23 to which is pivotally attached the end of a rod 24, the other end of which is pivotally coupled to a link 25 rigidly secured to the end of shaft 15. The opposite end of the transverse member 20 is provided with a similar pin 26 to which is attached one end of an adjustable coil spring 27, the other end of which is secured to a bracket 28 attached to the side 2 of the chute, the tendency of the spring 27 being to normally hold the treadle 17 up with its lower face flush with the lower surface of the chute floor and to compensate for any lost motion or irregular movement of treadle 17. At the opposite end of the transverse shaft 15 a link 29 is rigidly secured at one end, the other end of which is pivotally connected with a buffer or door check 30, of any well known type. Secured to the top 4 of the chute a spring supported buffer 31 is provided adapted to act as a shock absorber to lessen the violence of the shock if, by any chance, the door should be suddenly thrown upward. It will be seen that as a cake of ice, moving downward through the chute in the direction of the arrow, reaches the

treadle 17, the forward edge of the ice will slide up the inclined surface of the latter, causing the same to be depressed against the action of the coil spring 27, thus operating the rod 24 and link 25 to turn the shaft 15 about its axis, and consequently open the door 14. The arrangement of these operating parts is such that by the time the ice has passed sufficiently up the inclined surface of the treadle 17 to depress the same, the door will have been opened. Thus by the time the ice reaches the doorway, the door 14 will already have been swung out of the way, and consequently the door is not subjected to any shock due to the impact of the ice against it. After the ice has passed through, the treadle 17 is automatically raised by the spring 27, and the door will be closed either by its own weight or by the additional action of the door check 30 through link 29, returning shaft 15, the door check 30 acting to permit closing of the door 14 without shock.

The mechanism for recording the number of cakes of ice that pass through the chute and the time at which each one passes, together with the door operating mechanism, is sufficiently remote in its location from the ends of the chute to be practically inaccessible for one desiring to tamper with the same. In this manner the operation of the parts is dependent absolutely upon the passing cakes of ice, and are such that it is impossible for an ordinary cake of ice to pass through the chute without operating both sets of devices.

What I claim is:—

1. In an indicator actuating mechanism comprising in combination a chute adapted to have cakes of ice passed therethrough, an electric circuit including an indicator, a pair of movable electric contact members for said circuit arranged diagonally in opposite sides of said chute and adapted to be operated automatically by a cake of ice in its passage through the chute.

2. In an indicator actuating mechanism comprising in combination a chute adapted to have cakes of ice passed therethrough, an electric circuit including an indicator, a pair of movable contact members spaced apart longitudinally of said chute a distance slightly less than the length of a cake of ice, said members being supported in the opposite sides of the chute and extending beyond the sides into the opening, adapted to be displaced by a passing cake of ice to operate said circuit.

3. In an indicator actuating mechanism comprising in combination a chute adapted to have cakes of ice passed therethrough, an indicator, and a pair of movable contact members spaced apart longitudinally of said chute and at opposite sides thereof, a distance less than the length of a cake of ice, adapted to be displaced by a cake of ice in its passage through the chute to operate said indicator.

In testimony whereof, I affix my signature in presence of witnesses.

JAMES C. WARREN.

Witnesses:

A. PETFORD TERRY,
S. V. SOUTHALL,
J. L. SUITER,
WM. M. LAND.