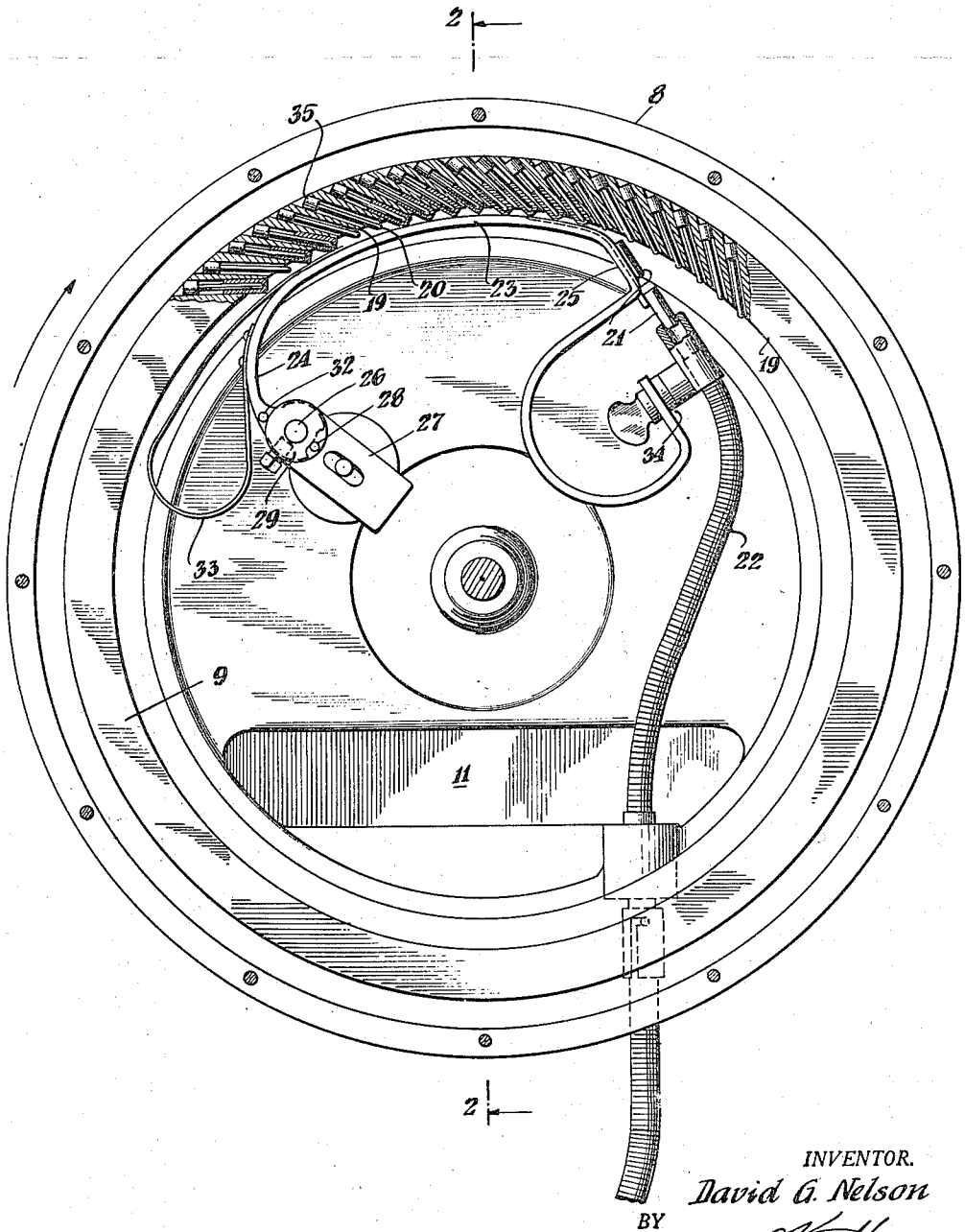
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SELECTING DEVICE

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Fig. 1




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Fig. 2

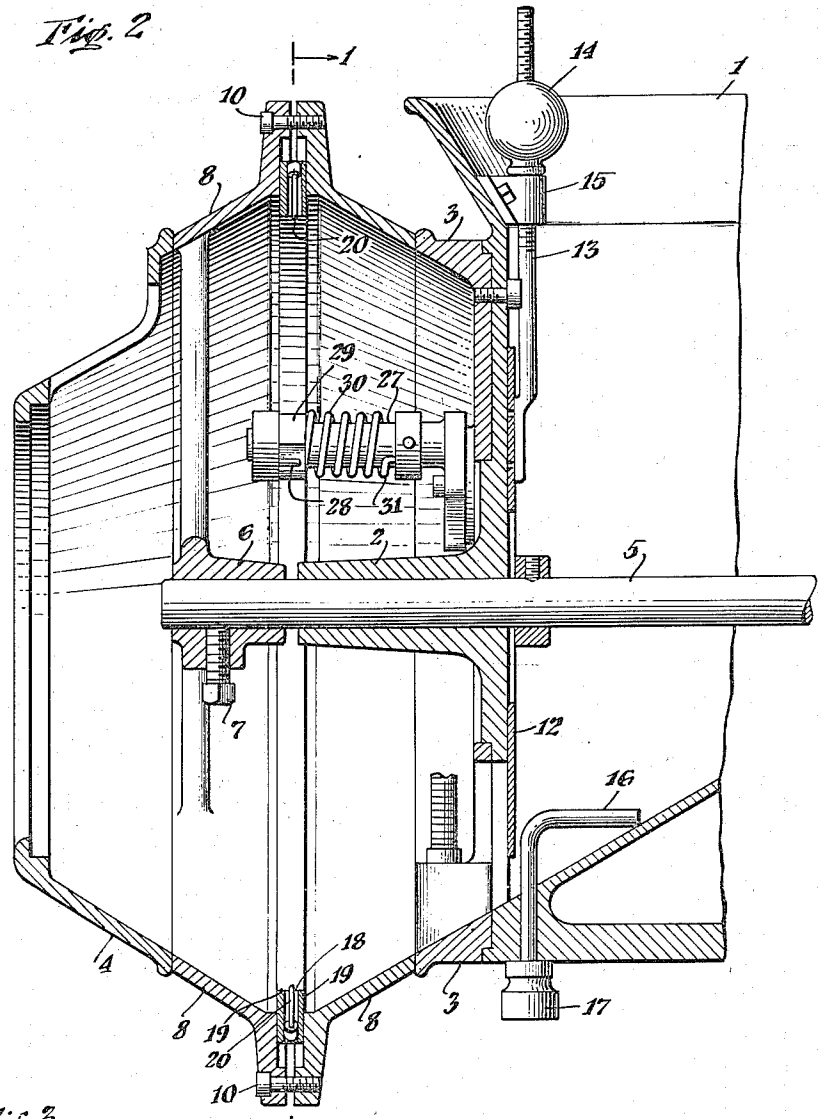
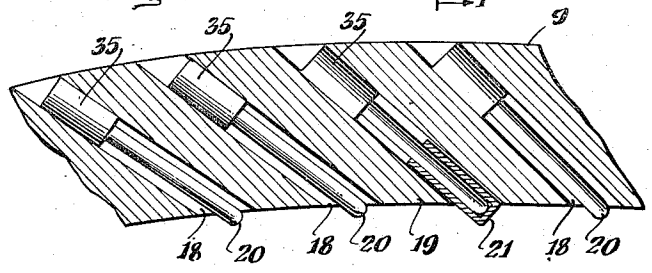



Fig. 3




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# UNITED STATES PATENT OFFICE

2,394,200

## SELECTING DEVICE

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5 Claims. (Cl. 209—72)

This invention relates to selecting mechanisms of the type designed to separately remove articles or blanks from a mass of the same and to deliver the selected item to a discharge point or other station where it is removed for transfer to a succeeding operation. Such mechanisms are usually embodied in hoppers designed to receive a mass of articles or blanks, such as tubular blanks, and to dispose such mass in the path of a selecting mechanism generally taking the form of a ring or other surface rotating about an axis in contact with said mass. On the surface of this ring are provided selectors, usually in the form of pins, positioned to incline in the direction of rotation.

The pins preferably lie in a plane of travel at right angles to the axis of rotation. As the pins travel through the unoriented mass of articles or blanks, any article which presents an open end or similar receiving aperture or cavity to a pin is seated thereon and thus carried out of the mass upon further rotation of the ring. In the devices of this character previously employed, difficulties have been encountered where the articles have jammed or otherwise forcibly seated themselves between adjacent selector pins or have canted on adjacent pins and jammed against each other so as to not be deliverable from the pin under normal operating conditions or, if deliverable, so as not to be deliverable in the position desired. This occasional jamming of the articles between or on the adjacent pins necessitates frequent interruption of the operation of the selecting device in order to clear the jammed article.

It is the general object of the present invention to provide an improved selecting mechanism of the type described which will overcome the jamming difficulties above mentioned. A further object of the invention is to provide a selecting mechanism which will positively select blanks or articles from a mass thereof only at the predetermined positions provided on such mechanism for receiving the blanks and at no other position. Other objects of the invention will appear from the following description of a hopper device including a selecting mechanism embodying the invention in a preferred form. Such a device is illustrated in the drawings in which:

Fig. 1 is a view taken through the hopper device in a vertical plane adjacent the selecting mechanism with portions of that mechanism shown in section;

Fig. 2 is a vertical cross sectional view taken through the hopper at the line 2—2 indicated on Fig. 1, and

Fig. 3 is an enlarged view of a portion of the selecting mechanism shown in section in Fig. 1.

Referring to the drawings in which like numerals designate like parts, the hopper includes an article receiving portion 1 (only partially shown) on one wall of which is provided a bearing 2. Affixed to this wall is an extension 3. Hopper end portion 4 is fixed in the position shown by suitable means attached to the article receiving portion 1. A shaft 5, adapted to be driven by a motor or other suitable means, is rotatably mounted in the bearing 2 and is fixed through lug 6 and set screw 7 to the rotatable portion of the hopper which consists of two housings 8 assembled, as shown, to hold therebetween a selector ring 9, the assembly being maintained by bolts 10. The inner edges of the hopper end 4 and of the extension 3 are adapted to contact the outer edges of the housing 8 during rotation thereof and to form with said housings a chamber. An opening 11 connects the receiving portion 1 with this chamber and is adapted to be completely or partially closed by gate 12, which gate may be moved up or down as desired by handle 13. Knob 14 is adjustably mounted on said handle through the screw threads shown and is adapted to rest on bracket 15 when so adjusted to hold the gate 12 in the desired position. A device, such as the rotatably mounted finger 16, may be positioned in article receiving portion 1 adjacent opening 11 to facilitate movement of articles therethrough. This finger moves into the opening as the knob 17 is turned and breaks up any collection of articles which may have momentarily closed such opening.

A series of recesses or cavities 18 are provided in the selector ring 9 and open in the inner, or axle-facing, surface 19 thereof. Mounted in each of these cavities is a selector pin 20 with its end extending to a point above i. e., beyond said inner surface. The pins and cavities are preferably inclined, as shown, in the direction of rotation (indicated by the arrow on Fig. 1) of the selector ring so that articles selected by the pins will be retained on the pin, and in the cavity, during at least a portion of the rotation of the ring. At a point of the rotation of selector ring 9, preferably remote from the point where selection of the articles occurs, a delivery station is provided where the articles 21 are removed, or allowed to fall by gravity, from the pins into a receiving device such as the tube 22, said tube affording means by which the articles may be delivered to any desired place for further operation. In order to prevent premature re-

moval of the articles from the cavities 18 and pins 20 prior to the time that rotation of the ring 9 brings the article to the desired position, any means may be provided which will prevent articles 21 from slipping out of the cavities and off the pins during the rotation of the ring. In the device as shown, this means comprises a guide plate 23 having a central portion concentric with selector ring 9 and end portions 24 and 25 which turn inwardly therefrom. This guide plate is located at a point, as shown, where the rotation of the ring tends to cant the pins carried thereby to the horizontal and below. The guide plate is mounted for limited movement around axial pin 26 on guide bracket 27, its movement on said axial pin being limited by pin 28 positioned on the end of the guide bracket and extending through the cutaway portion of collar 29. A spring 30 surrounds the axle of the bracket 27 with one end 31 affixed to the bracket and the other end 32 thereof attached to guide plate 23 so that the spring will resist downward movement of the guide plate and tend to return it to a position where its central portion is concentric with ring 9. Mounted on end portion 24 of the guide plate is a flexible finger 33. The opposite end 25 of the guide plate carries the tube 22 by means of a bracket 34.

The recesses 18 in the selector ring 9 may take the form of holes drilled entirely through the ring as here shown, in which case the pin 20 may be provided at one end with enlarged end 35 so sized as to form a press fit with the walls of the recess and to thus close the outer end of the recess as well as to fix the pin in proper position therein. It will be apparent that this method of construction has certain advantages since the pins may be readily removed from the recess for replacement. However, the recess or cavity 18 may extend partially through the ring and pins may be mounted therein in other ways than that shown. It is important that the cavities be separated one from the other so that each forms a separate cell in which an article may be received, and the cavities should be so shaped in size as to readily receive the article, selected by the pin, either in part, as shown in the illustrated case where the article 21 is in the shape of a tube with one end closed, or entirely if the shape of the article so allows and other conditions warrant. For instance, if article 21 is a tube open at both ends, the cavities 18 may be so shaped and sized as to receive the entire tube as it is selected and guided thereinto by the pin 20. The location and size of the pin is so predetermined, with respect to the cavity, as to permit the receival therein of the article. It will be apparent, however, that the cavity need not be of the exact shape of the article to be received, it being necessary only that the pin be so located in the cavity opening as to allow an article, or a portion thereof, to pass into said cavity.

As stated, the ends of the pins 20 should extend above the inner surface 19 of the ring 9. The length of this extension above said surface is preferably held to a minimum and in the preferred form the larger portion of the length of the pin is within the cavity. Enough of the pin should extend above ring surface 19 to provide a portion upon which an article from the mass contained in the hopper chamber can be caught and guided into the cavity. If the article to be selected is, for example, very flat, as in the case of a washer, the cavity may be very shallow, in which case the portion of the pin within the cavity may be shorter than the portion extending above the ring surface 19.

In operation the articles or blanks 21, having been admitted from the article receiving portion of the hopper to the hopper chamber through the opening 11, tumble in a mass in the bottom of the chamber as the rotatable hopper portion, formed of the housings 8 and the selector ring 9, is rotated by shaft 5. The selecting ring 9 thus travels in contact with the mass of tumbling blanks through a portion of its rotation and presents the ends of pins 20 to said mass, selecting from time to time such blanks as present to the pins an opening through which a pin may pass. The blank so selected by the pin slips over the pin and into the cavity 18 in the position shown in Figs. 1 and 3. The selector ring, rotating clockwise, now moves the pin and cavity-surrounded blank upwardly. As further rotation of the ring 9 tends to cant the pins toward an angle below the horizontal, the ends of the blanks are contacted, and are held upon the pin and in the cavity, first by the flexible finger 33 and later by the central portion of the guide plate 23 and thus held against the action of gravity until they have travelled to the end 25 of the guide plate at which time they lose contact therewith and fall by gravity into tube 22.

It will be noted that since a separate cavity is provided for each article and since the article selected by a pin is received within said cavity and there separately maintained, jamming between articles held on adjacent pins is obviated. It will be further noted that jamming of the article between adjacent pins may be eliminated by limiting the distance to which the end of the pins extend from the cavities above the inner surface 19 of the ring 9. By the use of this invention, whether embodied in the mechanism above described or in similar mechanisms, it is possible to select an article from a mass of articles and to separately seat the same in the selecting device and to thereby prevent canting of the articles on the pins and subsequent jamming thereof, as well as preventing jamming of articles between adjacent pins.

It will be apparent from the foregoing description that the invention herein described and hereafter claimed may be embodied in forms other than those specifically shown and described, and that the construction of the various parts may be widely varied without departing from the invention as defined in the appended claims.

Having thus described my invention, what I claim is:

1. In a mechanism for separately selecting articles from a mass thereof, a ring mounted to rotate about an axis, article receiving recesses separately disposed at predetermined intervals in the axis-facing surface of said ring, and a selector pin mounted in each of said recesses and extending therefrom to a point beyond said surface of the ring.

2. In a mechanism for separately selecting articles from a mass thereof, a ring mounted to rotate about an axis, article receiving recesses separately disposed at predetermined intervals in the axis-facing surface of said ring, and a selector pin mounted in each of said recesses and extending therefrom to a point just beyond said surface of the ring.

3. In a hopper, a portion adapted to contain a mass of articles and to rotate about a fixed axis, selector pins mounted at predetermined intervals on the inner periphery of said portion and adapt-

ed to contact and select articles from said mass, each such pin being partially and separately seated in a cavity in said inner periphery, said cavity being shaped and sized to receive and surround at least a portion of an article selected from said mass by said pin.

4. In an article selecting mechanism, a rotatable portion the inner surface of which is adapted to contact a mass of articles, said inner surface being provided with a plurality of separate cavities each shaped and sized to admit entry thereto of an article, and a selecting pin centrally mounted in each of said cavities and partially extending therefrom to a point beyond said inner surface.

5. In an article selecting mechanism, an article holding chamber partially-bounded by a circular wall adapted to rotate about an axis, a series of separated cavities opening in the inner surface of said wall and shaped and sized to receive and contain an article and a selecting pin mounted in each of said cavities and extending therefrom to a point beyond said inner surface, the size and location of said pin being so predetermined with respect to the size and shape of the cavity in which it is contained as to allow passage of an article selected by said pin into said cavity.

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