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MAGAZINE FOR THE AUTOMATIC FEEDING OF OBJECTS

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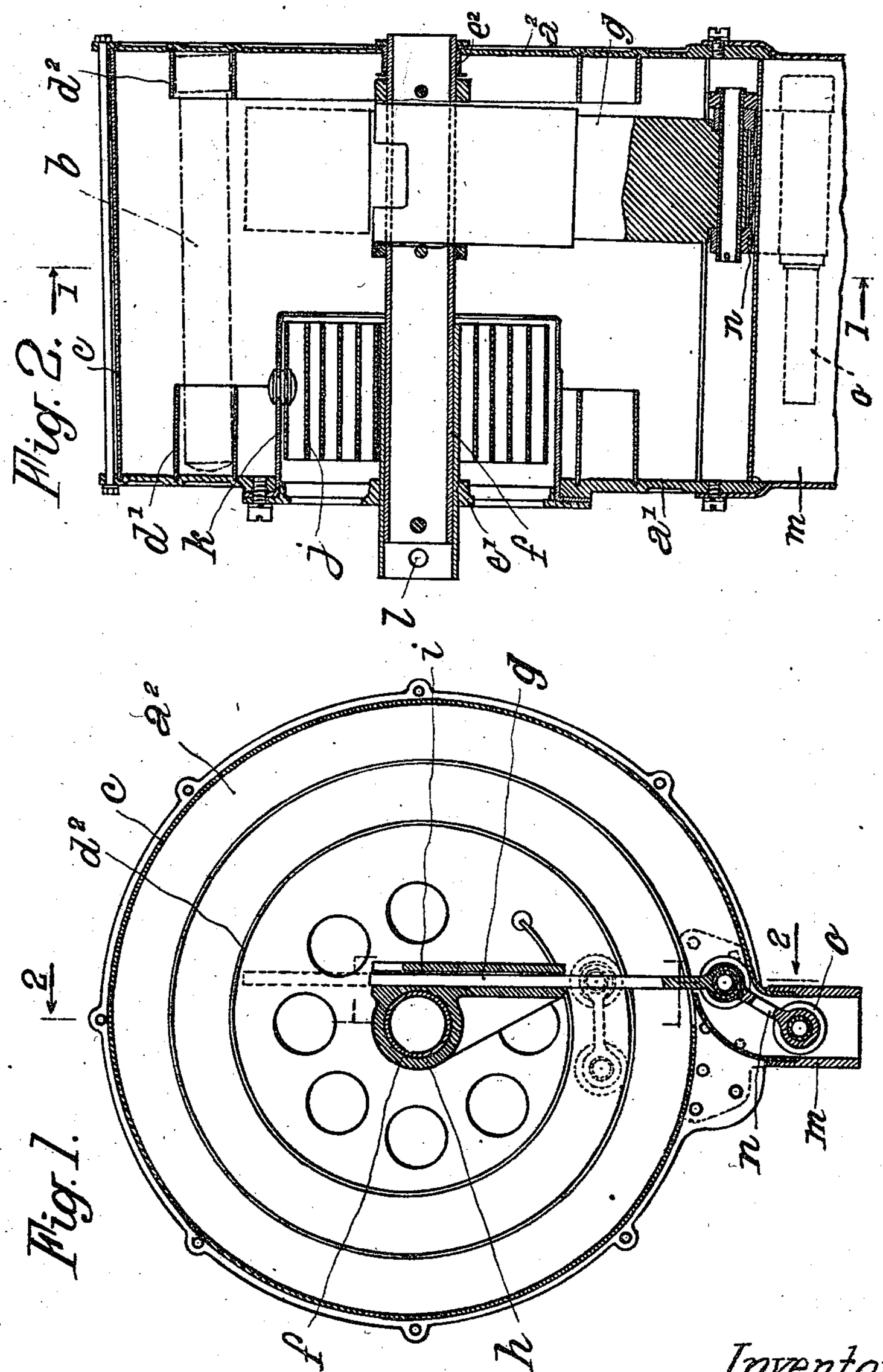

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MAGAZINE FOR THE AUTOMATIC FEEDING OF OBJECTS

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6 Claims. (Cl. 312—75)

My invention relates to magazines for the automatic feeding of a plurality of objects, all similar to one another, and especially of substantially cylindrical objects, such as rivets, assembling pins, etc. My invention is more particularly concerned with magazines of this type that are to be used in connection with machines, such as automatic machine-tools, adapted to successively catch, at certain intervals, the objects with which said magazines have been previously filled.

The object of my invention is to provide a magazine of the type above referred to which is both more reliable and more efficient in working than the similar mechanisms that have been used up to the present time.

To this effect, the magazine according to my invention includes a spiral-shaped slideway or guide in which the objects are stored, one behind the other, and an arm slidably carried by a shaft subjected to the action of elastic means tending to rotate it, the end of said arm being caused to move along said slideway and bearing against the last of these objects so as to push it along this slideway. With this arrangement, the whole of the objects present in the magazine is urged toward the outlet thereof, which coincides with the outer end of said spiral-shaped slideway.

Other features of my invention will appear from the following detailed description thereof.

A preferred embodiment of the present invention will be hereinafter described with reference to the accompanying drawing, given merely by way of example, and in which:

Fig. 1 is a sectional view, on the line 1—1 of Fig. 2, of a magazine for the feeding of pins according to the present invention;

Fig. 2 is a sectional view of the same magazine on the line 2—2 of Fig. 1.

It will be assumed, in the following description, that the magazine is intended to feed substantially cylindrical pins to an automatic machine-tool capable of machining them, but this assumption is made merely in order to facilitate explanations and it should be well understood that the magazine is capable of feeding any substantially cylindrical objects to any machine or device through which they pass successively.

The body of the magazine consists of a substantially cylindrical casing including two side plates a^1 and a^2 located at a distance from each other that is slightly greater than the length of the pins b to be fed by the magazine, the peripheral portions of said side plates being connected together by a cylindrical wall c which is provided with an orifice, which will be hereinafter referred to, for the outlet of said pins.

I provide, within this casing, spiral-shaped slideways or guides.

These slideways advantageously consist of two portions d^1 and d^2 respectively fixed to said side plates. These slideways are arranged in such manner that they can guide each one of the ends of the pins to be fed by the magazine, the spiral-shaped guideway ending on the outside of the orifice above referred to.

These guideways may for instance consist of a metallic band fixed at right angles to the corresponding side plate of the casing along a spiral line, such that the successive spires are at a distance from one another only slightly greater than the diameter of the pins to be fed by the magazine.

The side plates are provided, in their central portions, with bearings e^1, e^2 adapted to support a shaft f adapted to turn freely therein.

In order to push the pins with which the magazine is filled toward the outlet orifice, I provide an arm g one of the ends of which (which will be hereinafter called the active end of the arm) is so arranged that it may bear against the last of said pins present in the magazine. This arm is carried by shaft f in such manner as to be substantially at right angles to said shaft, but the active end of the arm must be capable of moving along a spiral corresponding to that of guideways d^1, d^2, said active end of the arm being preferably guided by said slideways.

To this effect, shaft f may be provided with a sleeve h laterally carrying a guide i in which arm g can slide, this arm and this guide being preferably of rectangular cross section, with its greater dimension lying in the direction of the axis of shaft f.

The dimensions of slideways d^1, d^2, on the one hand, and of arm g, on the other hand, are so chosen that, when the active end of said arm is located opposite the inner ends of said slideways, the other end of said arm is located at a distance as small as possible from the pins that are present in the first inner spire of the slideways (position shown in dotted lines in Fig. 1).

Elastic means are provided for causing shaft f to rotate in the direction that corresponds to the pins being driven by the active end of arm g toward the outlet orifice of the casing.

These elastic means may for instance consist of a spiral spring j the outer end of which is fixed to a drum k rigidly carried by the casing

and the inner end of which is fixed to shaft *f* itself.

It will be readily understood that, after shaft *f* has been rotated in the direction that winds spring *j*, when said spring is allowed to unwind, it causes the shaft to rotate in the opposite direction. Arm *g* therefore rotates together with the shaft while sliding with respect thereto within guide *i*, so that its active end moves along the slideways, from the inner to the outer ends thereof, pushing along the pins toward the outlet orifice.

Of course, spring *j* might be wound by introducing the pins one by one through said orifice, but it will be simpler to provide a device through which it will be possible to directly turn shaft *f*. Such a device may for instance consist of a prolonged part of shaft *f*, said prolonged part being provided with holes i into which it is possible to insert a spindle for turning the shaft.

The outer end of the spiral-shaped slideways is advantageously so arranged that the pins coming from the slideways are guided toward an outlet conduit *m*, for instance at right angles to wall *c*.

To this effect, I provide curved walls such that the pins fed by the magazine may move along them when they are pushed by the active end of arm *g*.

In order to suitably push out the last pin present in the magazine, the active end of arm *g* is made as shown in the drawing, that is to say is provided with a kind of link *n* articulated thereto and the free end of which carries a transversal element *o* capable of pushing along the pin with which it is to come in contact.

In order to reduce the frictional stresses as much as possible, the articulation of link *n* with arm *g* and element *o* are both fitted with rollers of a diameter substantially equal to that of the pins to be fed by the magazine and capable of engaging at least one of the slideways.

Link *n* is made of a length such that it may pass through the bend connecting the outer end of the spiral shaped slideway with the outlet conduit *m*. On the other hand this link must be of such a length that, when the articulation of said link with arm *g* reaches the end of the slideway, element *o* is fully engaged in said outlet conduit.

Arm *g* is then preferably mounted in a slightly oblique position with respect to shaft *f*, but anyway the axis about which link *n* is articulated to arm *g* is advantageously inclined with respect to the axis of shaft *f*. This inclination is, for instance equal to the mean value of the angles that the various objects present in the slideways make with this axis.

The working and advantages of the magazine according to my invention result clearly from the foregoing description and need not be further explained.

Of course, arm *g* is not necessarily made of a single piece and it might be given a telescopic structure so as to permit the spiral-shaped guideways to extend farther toward the inside of the casing for a given outer diameter of said casing.

While I have described what I deem to be a practical and efficient embodiment of my invention, it should be well understood that I do not wish to be limited thereto as there might be changes made in the arrangement, disposition and form of the parts without departing from the principle of my invention as comprehended within the scope of the appended claims.

What I claim is:

1. A magazine for the automatic feeding of a plurality of objects all of the same shape and size, which comprises in combination, a casing including two side plates and a substantially cylindrical wall connecting said plates to each other, two spiral shaped slideways fixed to said side-plates respectively and facing each other, said slideways being adapted to receive the respective ends of said objects side by side therein, so that said objects extend from one slideway to the other, a shaft journalled in said side plates centrally with respect to said slideways, an element slidably carried by said shaft on an arm extending in a direction substantially at right angles to said shaft, said element being located to one side of said shaft, means for causing said element to move along said slideways, a link pivoted to said element, a transverse element carried by the free end of said link adapted to move along said slideways and to push the last object in the slideways, said link having its free end on the same side, relatively to said slidable element, as said shaft, and elastic means for causing said shaft to turn in the direction that corresponds to the objects being pushed toward the outer end of said slideways by said end of the arm, said cylindrical wall of the casing being provided with an outlet orifice opposite said outer ends of the slideways.

2. A magazine according to claim 1 further comprising an outlet conduit substantially at right angles to said cylindrical wall of the casing, located opposite said outer ends of the slideways, and bent walls connecting said outer ends of the slideways with said outlet conduit, the curvature of said bent walls being such that said transverse element is capable of pushing the last object into said outlet conduit.

3. A magazine for the automatic feeding of objects all of the same shape and size, which comprises in combination, at least one spiral shaped slideway adapted to receive said objects side by side therein, a shaft centrally disposed with respect to said slideway, an element slidably carried by said shaft at one side thereof on an arm extending in a direction substantially at right angles to said shaft, means for causing said element to move along said slideway, a link pivoted to said element, a transverse element carried by the free end of said link adapted to move along said slideway and to push the last object in the slideway, said link having its free end on the same side, relatively to said slidable element, as said shaft, and elastic means for causing said shaft to turn in the direction that corresponds to the objects being pushed toward the outer end of said slideway by said end of the arm.

4. A magazine for the automatic feeding of objects all of the same size and shape, which comprises, at least one spiral shaped slideway adapted to receive said objects side by side therein, a shaft disposed within said slideway, an arm carried by said shaft and rotatable therewith, said arm being slidable with respect to said shaft at right angles to the axis of the shaft, a member on the end of said arm engaging in and guided by said slideway, a link pivoted on the end of said arm, and a second member mounted on the free end of said link engaging in and guided by said slideway, said last member engaging and pushing the last object in the slideway, and elastic means for causing said shaft to turn in such a direction as to push the objects out of the slideway.

5. A magazine for the automatic feeding of objects all of the same shape and size, which comprises, at least one spiral shaped slideway adapted to receive said objects side by side therein, a shaft disposed within said slideway, an arm carried by said shaft at one side thereof and rotatable therewith, said arm being slidable with respect to said shaft at right angles to the axis of the shaft, a link pivoted on the end of said arm, said link having its free end on the same side relatively to said arm, as said shaft, said free end engaging and pushing the last object in the slideway, and elastic means for causing said shaft to turn in such a direction as to push the objects out of the slideway.

6. A magazine for the automatic feeding of objects all of the same size and shape, which comprises, at least one spiral shaped slideway adapted to receive said objects side by side therein, a shaft disposed within said slideway, an arm carried by said shaft at one side thereof and rotatable therewith, said arm being slidable with respect to said shaft at right angles to the axis of the shaft, a member on the end of said arm engaging in a guide by said slideway, a link pivoted on the end of said arm, said link having its free end on the same side, relatively to said arm, as said shaft, and a second member mounted on the free end of said link engaging in and guided by said slideway, said last member engaging and pushing the last object in the slideway, and elastic means for causing said shaft to turn in such a direction as to push the objects out of the slideway.

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