

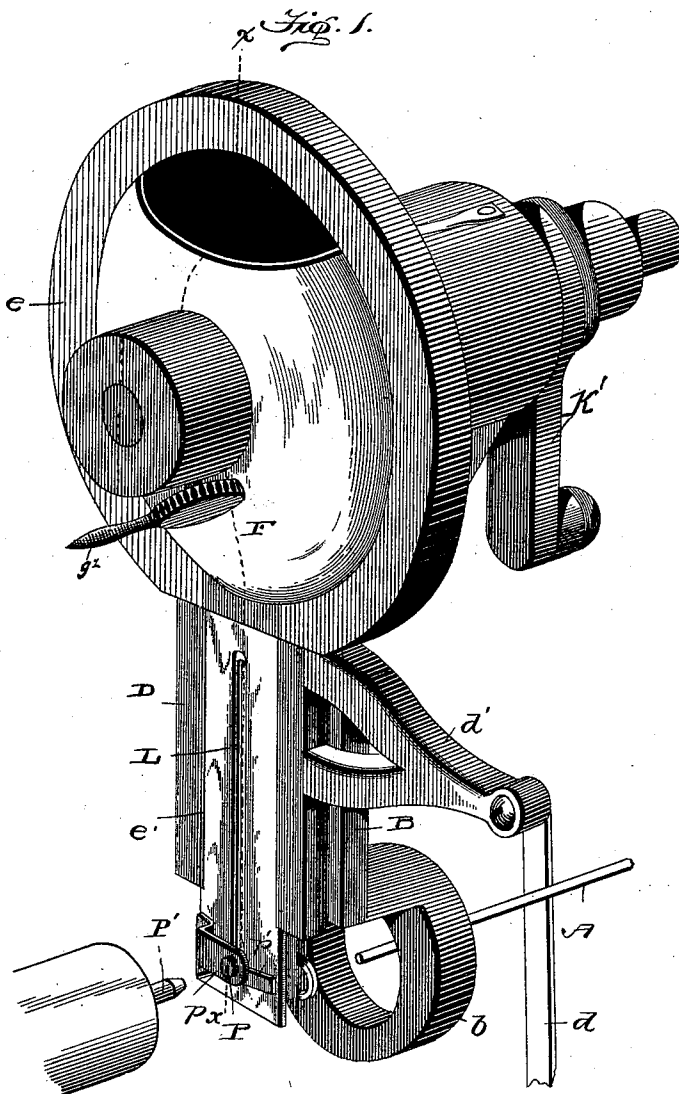
(No Model.)

2 Sheets—Sheet 1.

W. RUNDQUIST.
FEEDER FOR JEWEL SETTING MACHINES.

No. 519,027.

Patented May 1, 1894.



Witnesses:

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Wm. Rundquist.
Inventor:

By *Edwin B. S.*
Att'y.

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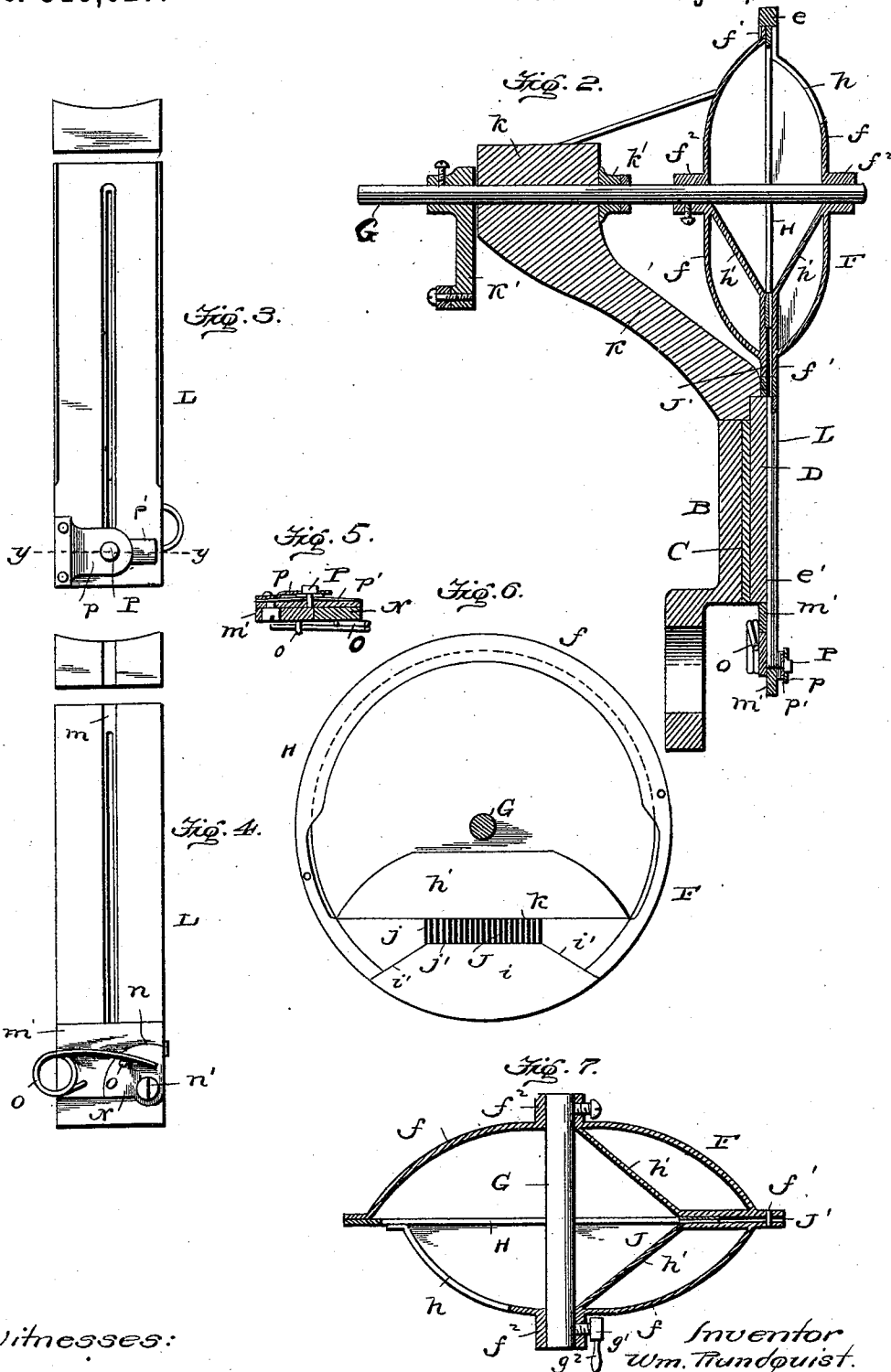
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UNITED STATES PATENT OFFICE.

WILLIAM RUNDQUIST, OF ELGIN, ILLINOIS.

FEEDER FOR JEWEL-SETTING MACHINES.

SPECIFICATION forming part of Letters Patent No. 519,027, dated May 1, 1894.

Application filed July 1, 1893. Serial No. 479,400. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM RUNDQUIST, a citizen of the United States, residing at Elgin, in the county of Kane and State of Illinois, have invented certain new and useful Improvements in Feeders for Jewel-Setting Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My present invention relates to a means for automatically feeding watch jewels to the settings in which they are to be placed and secured by automatic contrivances substantially such as those shown and described in my prior patent, dated July 4, 1893, No. 500,954, for jewel setting machines; and the objects in view are, first, to provide improved means adapted to receive the jewels indiscriminately and in any desired quantity; secondly, to govern and control, by automatic contrivances, the passage of the jewels through the feeder and cause them to be supplied to the settings one at a time; and finally to so construct the feeder that jewels of different sizes can be used therein and supplied to the settings with certainty and precision.

To the accomplishment of these ends, the first part of my invention relates to a hollow receiver, preferably made approximately globular in form, in which the jewels can be placed indiscriminately and provided with an arc shaped outlet opening through grooves or ways in which the jewels can be passed, a vertically reciprocating annular support in which the hollow receiver is mounted to oscillate and carrying a slotted feed plate to which the jewels from the receiver are adapted to be supplied, in series, as the receiver is oscillated, and suitable trip or valve mechanism which operates as the feed plate comes opposite to the setting when the structure is lowered to permit one of the jewels in the feed plate to be forced into the setting by a suitable expelling stud or pin.

The second part of my invention relates to the improved means for controlling the passage of the jewels through the feed plate and for expelling them into the setting, which consists in the combination with the slotted or grooved feed plate, of a spring controlled

pivoted gate or valve held normally closed across the lower end of the slot or groove in the feed plate and arranged in such position that, when the structure is lowered in position opposite to the setting, said gate or valve will strike against and be deflected by the revolving wire in which the setting is formed, and an expelling stud sustained by the feed plate opposite to the point of discharge of the jewel therein for forcing the jewel from said feed plate into the setting.

The third part of my invention relates to the novel means whereby the feeder can be adjusted to supply jewels of different sizes. This is attained by making the hollow receiver in sections and employing a spacing ring which conforms to the shape of and is fitted between the sections, and a removable grooved plate fitted between the ends of the spacing ring and the faces of the sections of the receiver. One end of the slotted or grooved feed plate fits between the ends of the spacing ring and in position to receive the jewels from the grooved plate; and this spacing ring, the grooved plate, and the feed plate are removable and can be replaced by other parts of different thickness so that jewels of different sizes can be properly fed through the receiver and the feed plate.

In the accompanying drawings, forming a part of this specification, I have illustrated the preferred embodiment of my present invention, in which—

Figure 1 is a perspective view of my improved jewel feeding mechanism, showing the revolving wire A designed to form the setting in which the jewels are to be placed, and an endwise movable spindle P' of my jewel setting machine by which the expelling plunger P is actuated to force the jewel into its setting in the revolving wire, A. Fig. 2 is a vertical sectional view on the line $x-x$ of Fig. 1. Figs. 3 and 4 are detached views of reverse elevations of the removable feed plate, and Fig. 5 is a horizontal sectional view on the plane indicated by the dotted line $y-y$ of Fig. 3 taken through the lower part of said feed plate to show the valve and expelling mechanism. Figs. 6 and 7 are detail views of the hollow feeder.

Referring to the drawings, in which like letters of reference denote corresponding parts

in all the figures, A designates the revolving wire from which the setting is to be formed and in which the jewel is to be placed, and B is a stationary standard which is provided with a clamp ring *b* adapted to fit around the mouth of the lathe and to be clamped thereon by suitable screws, the revolving wire A running through the clamp ring.

The stationary standard B is provided on one side or face with the vertical guide way C, preferably dovetail in cross section, and in this way is fitted the reciprocating slide D, shaped to conform to the guide way. This slide is designed to sustain the receiver, the feed plate, and the trip or valve mechanism, and this slide is reciprocated vertically at proper intervals by means of a cam (not shown) which operates the lever *d* pivoted to the outer end of a rigid arm *d'* fastened to the slide. The upper end of this slide carries an annular support *e* which is rigid with the slide, and in one face of this slide is formed a groove *e'* which extends from the lower end of the slide clear through the lower part of the annular support.

F is the hollow receiver which is fitted snugly within the annular support *e* and is adapted to oscillate or rock therein for a limited distance. This receiver consists of two sections *f, f*, made in the form of concavo-convex disks each having an annular flange *f'* and a hub *f²*. These sections are fitted on a rock shaft G with their concave sides facing each other and their flanges *f'* in position to bear one upon the other; and one section of this receiver is permanently fixed to the shaft in any preferable way while the other section *f* is detachably clamped thereto by means of the binding screw *g'* having a head or handle *g²*, the screw working in a threaded socket in the hub of the section. The upper edge of one section *f* is cut away to provide an opening *h* in the receiver through which a quantity of jewels can be placed in the chamber of the receiver, and the lower inner sides of the sections are inclined toward each other at *h'* to direct the jewels properly to the outlet opening from the receiver.

Between the lapped flanges *f'* of the sectional receiver is interposed a spacing ring H which is of such thickness that the sections *f* are spaced apart a distance sufficient for the jewels to pass through the opening or space formed between the flanges *f'*, and a series of these spacing rings H is employed which vary in thickness according to the thicknesses of the jewels to be supplied through the receiver. This opening strip conforms to the shape of the flanged receiver, and in the preferred embodiment of the invention, shown more clearly by Fig. 6, the spacing ring is made from a flat piece or plate of metal with a segment of said spacing ring cut out to provide an opening or space *i* in one side thereof, the extremities of the ring like strip being undercut or beveled as at *i'*. A countersunk recess *j* is formed in the inner face of one of

the sections *f*, and in this recess is fitted a grooved and ribbed plate J, the ends of which are beveled as shown. This plate is fitted in the recess *j*, practically flush with the face of the section, but its exposed face is formed with a series of transverse parallel ribs *j'* forming a like series of channels or grooves *k*; and a series of these channeled plates J is provided and made interchangeable, the channels in the plates varying in size according to the sizes of the jewels to be supplied from the receiver to the feed plate. The spacing ring H is confined between the flanges of the sections by pins fixed on one section *f* passing through apertures in the ring H and the other section *f*, but this particular connection is immaterial and can be changed at pleasure; and the channeled plate J is fitted between the beveled ends of the spacing ring, whereby a discharge opening *J'* is provided in the lower side of the receiver between the flanges *f'* of the sections *f* and between the extremities of the spacing ring to permit the jewels from the channeled plate to pass to the groove or slot in the feed plate. It will be noted that the binding screw can be released to permit one member *f* of the receiver to be adjusted away from the other member, for the purpose of having ready access to the ring H and the plate J, and that the ring and plate can be detached, other rings and plates substituted therefor, and the loose receiver member *f* again adjusted to close the receiver and confine the spacing ring H in place by tightening the binding screw, whereby spacing rings and channeled plates of different sizes can be readily adjusted and the receiver adapted to feed jewels of different sizes.

The rock shaft G by which the receiver is oscillated is journaled in a fixed bearing *k* on an arm K rigid with the upright slide D, and said shaft has the stop collar *k'* and a crank arm K', to which arm K' is pivoted a link (not shown) operated by a suitable cam (not shown) for oscillating the receiver at the proper intervals.

L is the removal feed plate which is fitted in a dovetail groove or way *e* provided in the outer face of the slide D, the upper end of said feed plate fitting close to the oscillating receiver F and the lower extremity of said plate extending and protruding below the slide D on which it is carried. The feed plate L may be made in one piece, or it may be composed of two or more sections; and said feed plate has a groove *m* formed on its inner side in position to receive the jewels from the channeled plate J and the opening *J'* in the receiver. If the feed plate is made in sections, the groove is formed in the upper section and a slot is made in the lower section as shown by Figs. 3, 4 and 5; or the slot may be made nearly continuous throughout the feed plate. The lower protruding end of the feed plate has a solid foot piece *m'* attached to or made a part of the plate across the slot or groove *m* therein, and in one end of this

foot m' is formed an arc-shaped recess n in which is fitted a segmental gate or valve N which is pivoted at n' to the feed plate. This gate or valve N has a lateral stud or pin o against which bears an arm of the spring O attached to the foot m' , which spring normally forces the segmental gate or valve over the lower end of the groove or slot m to prevent the jewels from escaping from the feed plate; but this feed plate and the valve are so arranged relatively to the jewel setting or the revolving wire A that, when the device is lowered into position, the gate N will strike against the wire or setting A with sufficient force to overcome the tension of the spring O and thus lift the valve to permit the slot or groove m in the feed plate to come opposite to the cavity in the setting A whereby a jewel in the groove or slot m can be forced, by the expelling stud or pin P , into the setting. This expelling stud or pin P is guided by a bracket p fixed to the opposite side of the feed plate, and said stud or pin is normally held in place, out of the path of the jewels, by means of a tension spring p' , also attached to the feed plate, the other end of the expelling stud being extended or projected through the bracket p so that it is adapted to be moved endwise at the proper time by means of an endwise spindle P' indicated in Fig. 1 of the drawings, said spindle being mounted to reciprocate in a revoluble carrier forming a part of a jewel setting machine of the class shown and described in my prior patent hereinbefore referred to. A series of these feed plates L is provided to fit in the groove or way in the reciprocating slide D , the slots or grooves in the feed plates being made in different sizes according to the diameters of the jewels to be supplied, each feed plate being equipped with an automatically tripped gate and the expelling stud; but I would here remark that I do not strictly limit myself to the precise form and arrangement of automatic valve and expelling stud herein shown and described as the preferred embodiment of this improvement.

The operation may be briefly described as follows:—A spacing ring H and channeled plate J of the proper size are adjusted between the members of the receiver, and a feed plate L having a groove or slot m of the size to receive the jewels is adjusted in the guide or way e' of the slide D , after which a quantity of jewels is placed by hand in the receiver F through the opening h therein. The machine is now started to revolve the cams by which the receiver F is oscillated, and the slide D reciprocated with its attached parts, the movements of the slide and receiver being so timed and arranged to secure the proper performance of their functions. The oscillation of the receiver causes the jewels therein to pass through the channeled plate J into the slot or groove of the feed plate L until the same is filled with a series of jewels from the gate or valve N up to the channeled plate

J , and when a jewel is discharged from the plate L the remaining jewels are fed through the plate L by gravity and another jewel from the channeled plate J is supplied to the feed plate L so that jewels are constantly supplied from the receiver to the feed plate. When the slide D and its attached parts are lowered, the lower edge of the gate or valve N impinges against the wire or jewel setting A and is raised thereby to permit the setting A to come opposite to the groove or slot m in the feed plate; the spindle of the jewel setting machine is now advanced to move the plunger P and force a jewel from the plate L into the cavity of the setting after which the spring p' returns the plunger P to its normal position and the slide D is raised so that the spring O returns the valve N across the slot or groove m to prevent the jewels from escaping out of the lower end of the slot or groove m in the feed plate.

I am aware that changes in the form and proportion of parts and details of construction of the devices herein shown and described as an embodiment of my invention can be made without departing from the spirit or sacrificing the advantages thereof, and I therefore reserve the right to make such changes and alterations therein as fairly fall within the scope of the same.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination of a reciprocating slide, a receiver carried by said slide and capable of oscillating motion independently of the reciprocating motion of said slide, and a channeled feed-plate carried by said reciprocating slide in position to receive from said oscillating receiver and provided with mechanism for controlling the ejection of the jewels into the jewel-settings, substantially as and for the purposes described.

2. The combination of a vertically reciprocating slide provided with a longitudinal raceway, a receiver carried by said slide in position to discharge to the raceway therein and capable of oscillating movement independently of the reciprocating movements to said slide, and valve and expelling mechanisms to control the discharge of the jewels from said raceway in the slide, substantially as and for the purposes described.

3. The combination of a vertically reciprocating slide provided with a longitudinal jewel receiving groove or slot, an oscillating receiver carried by said slide and provided with a channeled plate at its point of discharge to the jewel slot or groove in the slide, a valve-mechanism at the lower end of the slot or groove to be opened as the slide moves into position opposite a jewel setting, and an expelling plunger, substantially as and for the purposes described.

4. The combination of a slide provided with a jewel receiving slot or groove, an oscillating receiver carried by said slide at one end of

- the groove or slot therein to supply jewels to said slot or groove, a valve mechanism at the opposite end of said groove or slide to normally cut off the escape of jewels and operated as the slide moves into position opposite to the jewel setting to expose the groove or slot of the slide, and an expelling stud or pin supported in line with the groove or slot, for the purposes described, as set forth.
5. The combination of a slide, a removable slotted or grooved plate carried thereby and provided with a valve and an expelling plunger, and a receiver supported on said slide in position to deliver jewels into the groove or slot of the feed plate, substantially as described.
6. The combination of a slide, an oscillating receiver supported thereon and having a variable discharge opening therein, a removable feed plate carried by the slide and provided with a jewel slot or groove to receive from said opening in the receiver, a valve on the feed plate to normally close the delivery end of the slot or groove, and an expelling plunger, substantially as and for the purposes described.
7. A sectional receiver, substantially such as described, constructed to vary the size of the discharge opening therein, combined with a slide by which said receiver is carried, a feed plate removably attached to the slide and provided with the longitudinal jewel passage or groove which receives from the variable discharge opening of said receiver, and a valve carried by the lower end of the feed plate, as and for the purposes described.
8. A sectional jewel receiver provided with a removable spacing ring arranged to form a discharge opening between the members or sections of the receiver, combined with a feed plate, a valve mechanism, and an expelling plunger, substantially as described.
9. A jewel receiver consisting of sections laterally clamped together and a spacing ring confined between said sections of the receiver and constructed to provide an outlet opening between the same, as and for the purposes described.
10. A jewel receiver provided with a spacing ring arranged therein to form the discharge opening and a channeled plate situated in said discharge opening, substantially as and for the purposes described.
11. A jewel receiver having one of its sections provided with a channeled surface and a spacing ring clamped between the sections or members of the receiver and having its ends terminating at the channeled surface and forming a discharge opening in one side of said receiver, for the purposes described, substantially as set forth.
12. A jewel receiver having a spacing ring removably clamped between its members or receivers and a detachable channeled plate seated between said receiver members and the ends of the spacing strip, substantially as described, for the purposes set forth.
13. The combination of a rock shaft carrying a sectional receiver having a removable spacing ring clamped between its members and a channeled plate situated in the discharge opening, a reciprocating slide in which the receiver and shaft are mounted to turn, the grooved or slotted feed plate removably attached to the slide, a valve carried by the slide near one end, and an expelling plunger on the slide opposite to the valve thereon, substantially as and for the purposes described.
- In testimony whereof I affix my signature in presence of two witnesses.
- WILLIAM RUNDQUIST.
- Witnesses:
C. H. WAYNE,
FRED W. SADLER.