June 2, 1931. E. B. STIMPSON 1,807,942

RIVET FEED

Filed July 11, 1928 3 Sheets-Sheet 1

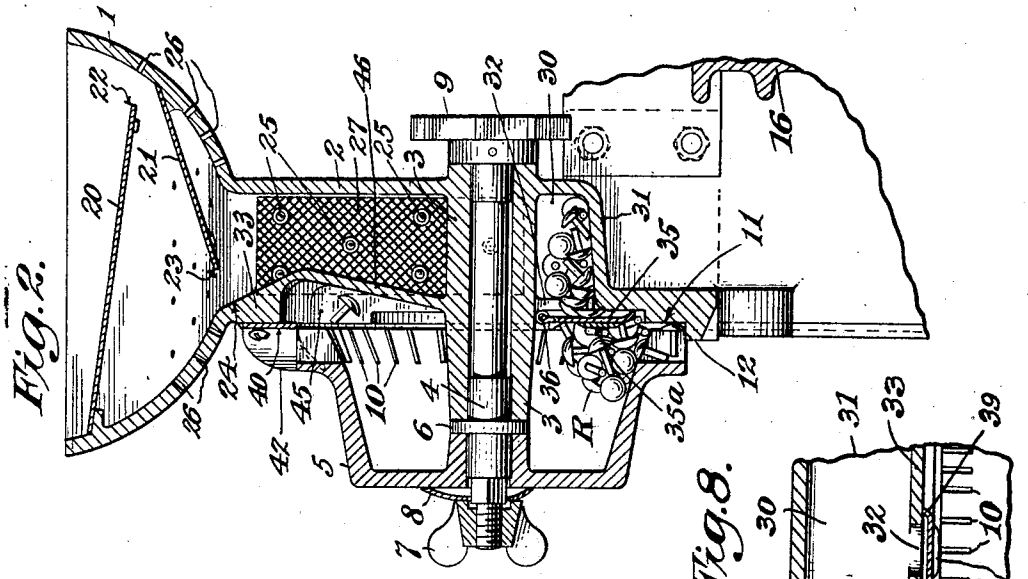


Fig. 2.

Fig. 3.

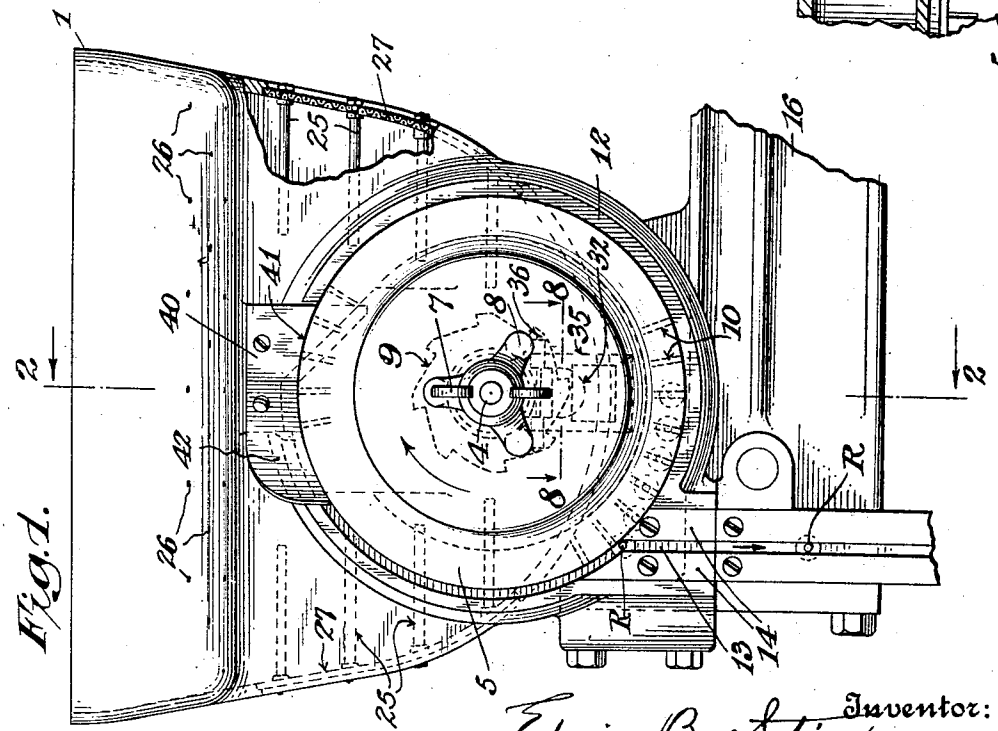


Fig. 1.

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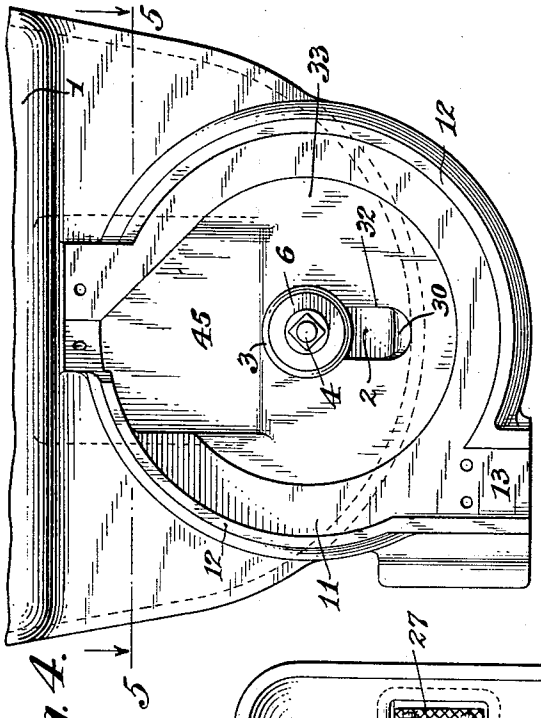


Fig. 4.

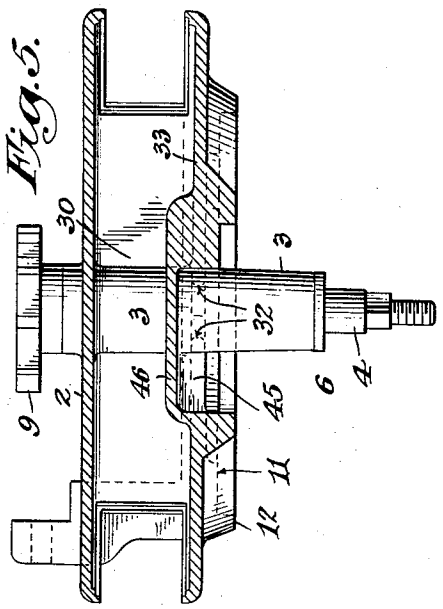


Fig. 5.

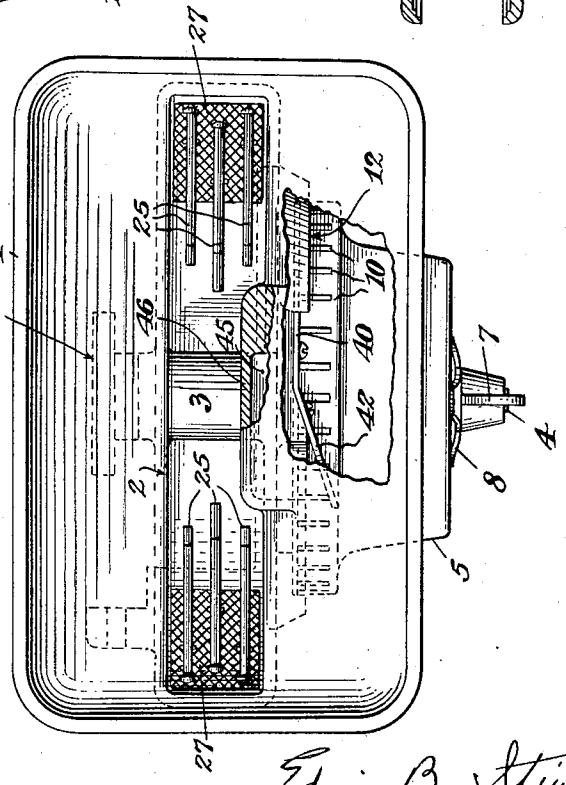


Fig. 3.

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Filed July 11, 1928 3 Sheets-Sheet 3

Fig. 7.

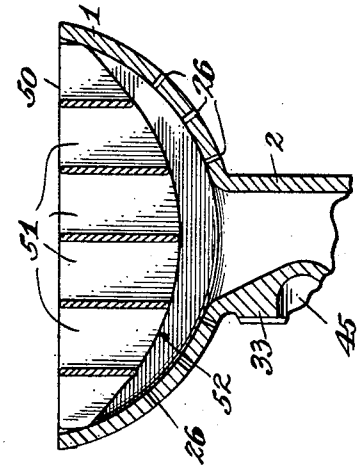
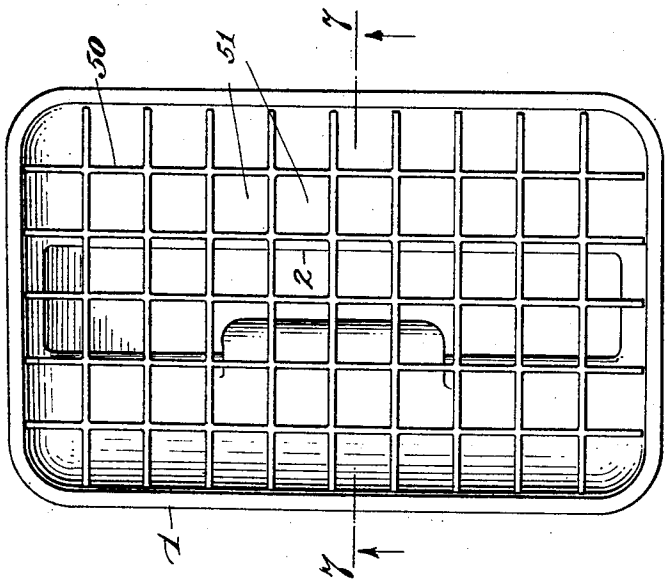


Fig. 6.



Edwin B. Stimpson INVENTOR:
BY
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Patented June 2, 1931

1,807,942

UNITED STATES PATENT OFFICE

EDWIN B. STIMPSON, OF BROOKLYN, NEW YORK, ASSIGNOR TO EDWIN B. STIMPSON COMPANY, OF BROOKLYN, NEW YORK, A CORPORATION OF NEW YORK

RIVET FEED

Application filed July 11, 1928. Serial No. 291,775.

My invention relates to rivet feeding mechanism generally similar to that disclosed in application of myself and Joseph F. Suessle, filed July 25, 1923, Serial No. 653,655.

The principal object of the invention is to regulate, and secure improved or more effective movement or "flow", of rivets in various parts of the feed-mechanism, and especially to avoid clogging of rivets which has heretofore interfered more or less with the proper feed action. This is accomplished by various modifications and improvements in structure and arrangement of parts, including, as briefly described, providing means in the receiving hopper to divide or regulate the movement of masses of rivets therefrom; also providing means in the passage leading from the hopper to the selecting wheel for retarding or regulating the flow of rivets therethrough and preventing clogging; providing a restricted opening or port leading from the passage just referred to, to the selecting wheel, and also preferably in some cases providing a gate or valve which controls rivet movement through the port; and providing a recess of improved form or arrangement, above the wheel shaft, for return of rivets ejected from the wheel, to the lower part thereof, where they are again subjected to the selecting or feed action of the wheel.

The characteristics and advantages of the invention are further sufficiently explained in connection with the following detail description of the accompanying drawings, which shows certain exemplifying embodiments. After considering these examples, skilled persons will understand that many variations may be made, and I contemplate the employment of any structures that are properly within the scope of the appended claims.

In the drawings:

Fig. 1 is a front elevation of feed mechanism embodying the invention in one form, with a part of the hopper broken away.

Fig. 2 is a section at 2—2, Fig. 1.

Fig. 3 is a top plan, with a part of the hopper broken away.

Fig. 4 is a front elevation, with the wheel and ejector plate removed.

Fig. 5 is a section at 5—5, Fig. 4.

Fig. 6 is a top plan of a modified hopper.

Fig. 7 is a section at 7—7, Fig. 6.

Fig. 8 is a fragmentary detail view showing the gate for controlling movement of the rivets.

The present machine in general structure and arrangement, and except as pointed out hereafter in describing the present improvements, may be constructed and arranged as disclosed in the above identified application, and operates in a similar way. It comprises a receiving hopper 1, formed at the top of a wide and relatively narrow passage 2, the lower part of which is intersected by a bearing sleeve 3. In this bearing is a shaft 4, carrying at one end the annularly chambered selecting or feed wheel 5. The shaft has a flange 6 engaging one end of sleeve 3, and the wheel is secured detachably to the shaft by a wing nut 7 and spring washer 8. At the other end is a ratchet wheel 9, sufficiently representing any known or suitable means for rotating the shaft and wheel 5 intermittently, such for example, as shown in the application referred to. The periphery of wheel 5 is provided with spaced rivet receiving slots 10, the inward ends of which confront the part-annular vertical face 11 of the hopper structure, or "body" of the machine. This face or wall 11 has a peripheral rim 12, which is interrupted at a point 13, below and to the left of the wheel axis (as viewed in Figs. 1 and 4) to receive spaced guide strips 14 (Fig. 1) forming a channel, into which rivets properly positioned, in the wheel slots are dropped, and through which they pass to rivet setting mechanism, of which the upper frame or jaw-member 16 is shown as the support for the present feed mechanism.

As so far described, the mechanism and its operation are substantially as in the previously identified application of Stimpson and Suessle. The improvements constituting the present invention are as follows:

In the hopper 1 I provide one or preferably a plurality of vertically spaced plates, deflectors or baffles 20, 21, secured to the hopper

walls, and downwardly inclined, so that when a mass of rivets R is dumped in the hopper, only a restricted part of them can slide past the edge 22 of the upper plate 20 to plate 21; and the discharge edge 23 of this plate is also so spaced from wall 24 of passage 2 as to provide a restricted opening leading to the top of the passage. In this way the "mass" of rivets is retraded or its flow restricted, and jamming in the hopper and upper part of the passage 2, prevented.

Retarding or restricting means are also desirably provided in passage 2, such as the spaced and "staggered" pins 25, which may be inserted in any of the passage walls, and serve to break up the mass of rivets going through the passage and prevent clogging therein.

Desirably also I provide means for the discharge of dust and dirt which may be intermixed with the rivets, such as apertures 26 in the lower part of the hopper, and relatively-large-meshed screens 27 in the curved edge walls of passage 2. Such screens, or analogous openings in the passage walls permit inspection of rivets passing through, and also admit the insertion of a small rod to "break up" or dislodge any jammed mass of rivets in the passage. The various apertures or screens also provide for cleaning of the rivets by virtually a "sifting" action, as they are agitated and separated by the tortuous movement over the baffles 20 and 21 and past the pins 25.

The lower part of passage 2, below bearing sleeve 3, is formed or arranged as a space or chamber 30 having a moderately-downsloping bottom wall 31 for the direction by gravity flow of rivets to a regulating opening 32 in passage wall 33. This opening is preferably located centrally below the shaft sleeve, so that rivets passing the sleeve move toward the opening from two opposite directions. The total area, or shape, of the opening, may be varied in accordance with the desired amount of restriction of flow toward the lower part of the wheel-chamber.

I also preferably provide in some cases additional means for controlling flow of rivets into the wheel chamber, and such means is desirably of a character to effect practically automatic regulation, in accordance with the rate of withdrawal of rivets from the wheel chamber; or as otherwise stated, in accordance with the "mass" of rivets located at any time in the lower part of the wheel. For this purpose a gate or valve 35 (Figs. 1, 2 and 8) is provided, partly or entirely overlapping opening 32 at its discharge side, and pivotally connected at 36 at the upper edge of the opening. Preferably this gate has curved or angularly bent vertical margins 38 and 39. Normally, the gate falls by gravity to close the opening. The flow of rivets from chamber 30 opens the gate permitting them to pass to the wheel chamber, restricted, however, in amount or rate of flow by tendency of the gate to close. The mass of rivets tending to move along with the wheel in the lower part of the wheel chamber, is also caused to contact with beveled edge 38 of the gate, so that as such mass of rivets increases, there is an increased tendency to close the gate by the angular reaction of the rivets on edge 38, and thus partly or entirely prevent inflow of rivets, until their mass is decreased by feeding action of the wheel, whereupon the gate will open more or less and admit more rivets, sufficient to properly supply the wheel, without excess. The size, or especially the vertical dimension, of the gate, may be varied in accordance with conditions, or the desired regulating effect; and it may also be provided with a variable weight 35ª, which increases its tendency to close, and to restrict the rivet flow.

To clear from the wheel slots rivets which are carried beyond the discharge point (13, Fig. 1) an ejector 40 is provided, consisting of a plate of sheet metal, secured to wall 33 at the top of the wheel, and having an arcuate edge 41 conforming to the wheel periphery, and an angular portion 42 arranged to engage projecting rivet heads and move the rivets inwardly, out of the slots. To more effectively and freely receive such "cleared" or ejected rivets, and return them properly to the lower part of the wheel chamber, for renewed selective action of the wheel, I provide a recess 45, produced by special formation of passage wall 33, this recess being substantially "centered" in respect to the shaft-sleeve, having its upper portion relatively deep (in a horizontal direction), and having its upright wall 46 sloping outwardly toward the wheel; so that rivets ejected from the top slots of the wheel are readily received in the upper part of the recess and deflected and guided downward at either side of the bearing sleeve, to the lower part of the wheel.

By all the means described, the flow of rivets is well, and in certain respects, automatically, controlled; jamming is greatly decreased or entirely prevented, and the selective or feed action of the wheel, and regularity of supply of rivets to the riveting machine, greatly improved.

Figs. 6 and 7 illustrate modified means, in association with the hopper, for "breaking up" or controlling the movement of the mass of rivets therein. Instead of the baffle plates previously described, I provide a grid 50, located in the upper part of the hopper, and consisting of vertical, transversely arranged plates or walls, defining relatively deep openings or passages 51. The lower contour of this grid is curved, or generally arcuate, as at 52, Fig. 7, and is also shaped to provide a varying clearance from the hopper bottom; or in other words, the central passages are

relatively deep, and those toward the sides of the hopper are shorter, and there is also less space or clearance from the hopper bottom, at the sides, than at the center. Thus, when a mass of rivets is dumped into the hopper, this mass is divided by the grid, the portions overlying the central openings tending to move first, and more freely and directly to and through passage 2, while the rivets falling through the side passages rest on the hopper bottom, and move toward the passage mouth after those in the central passages have passed through. In this way a regulated or graduated movement is provided, and clogging is effectively prevented.

I claim:

1. Rivet-feeding mechanism comprising a body structure including a hopper and spaced walls therebelow providing a downwardly convergent rivet passage, a shaft, a chambered feed wheel provided with a slotted rim face on one end of the shaft and having its slotted rim face adjacent an outer wall face of the body structure, said wall having a restricted rivet discharge opening below the shaft and leading to the wheel chamber, and a gate pivoted at the top of said rivet discharge opening and swingable toward and from the outer side thereof and regulating rivet discharge.

2. Rivet-feeding mechanism comprising a body structure including a hopper and spaced walls therebelow providing a downwardly convergent rivet passage, a shaft, a chambered feed wheel provided with a slotted rim face on one end of the shaft and having its slotted rim face adjacent an outer wall face of the body structure, said wall having a restricted rivet discharge opening below the shaft and leading to the wheel chamber, and a gate pivoted at the top of said rivet discharge opening and swingable toward and from the outer side thereof and regulating rivet discharge, and a weight on the gate increasing its tendency to close.

3. Rivet-feeding mechanism comprising a body structure including a hopper and spaced walls therebelow providing a downwardly convergent rivet passage, a shaft, a chambered feed wheel provided with a slotted rim face on one end of the shaft and having its slotted rim face adjacent an outer wall face of the body structure, said wall having a restricted rivet discharge opening below the shaft and leading to the wheel chamber, and a gate pivoted at the top of said rivet discharge opening and swingable toward and from the outer side thereof and regulating rivet discharge, the gate having a substantially angular anterior vertical edge formation against which rivets moved by the wheel have an angular reaction, tending to urge the gate to close to an extent depending on the mass of rivets in the wheel.

4. Rivet-feeding mechanism comprising a body structure including a hopper and spaced walls therebelow providing a downwardly convergent rivet passage, a shaft bearing transversely intersecting the rivet passage near the bottom thereof, a shaft passing through the bearing, a chambered feed wheel provided with a slotted rim face on one end of the shaft and having its slotted rim face adjacent an outer wall face of the body structure, said wall having a restricted rivet discharge opening below the shaft bearing and leading to the wheel chamber at substantially right angles to the plane of rotation of said wheel, and a gate pivoted at the top of said rivet discharge opening and hanging against the outer side thereof, swingable outward and inward toward the adjacent wall and regulating rivet discharge.

5. Rivet-feeding mechanism comprising a body structure including a hopper and spaced walls therebelow providing a downwardly convergent rivet passage, a shaft bearing transversely intersectiong the rivet passage near the bottom thereof, a shaft passing through the bearing, a chambered feed wheel provided with a slotted rim face on one end of the shaft and having its slotted rim face adjacent an outer wall face of the body structure, said wall having a restricted rivet discharge opening below the shaft bearing and leading to the wheel chamber at substantially right angles to the plane of rotation of said wheel, and a gate pivoted at the top of said rivet discharge opening and hanging against the outer side thereof, swingable outward and inward toward the adjacent wall and regulating rivet discharge, and a weight on the gate increasing its tendency to close.

6. Rivet-feeding mechanism comprising a body structure including a hopper and spaced walls therebelow providing a downwardly convergent rivet passage, a shaft bearing transversely intersectiong the rivet passage near the bottom thereof, a shaft passing through the bearing, a chambered feed wheel provided with a slotted rim face on one end of the shaft and having its slotted rim face adjacent an outer wall face of the body structure, said wall having a restricted rivet discharge opening below the shaft bearing and leading to the wheel chamber, and a gate pivoted at the top of said rivet discharge opening and swingable outward and inward toward the adjacent wall and regulating rivet discharge, the gate having a substantially angular anterior vertical edge formation against which rivets moved by the wheel have an angular reaction, tending to urge the gate to close to an extent depending on the mass of rivets in the wheel.

7. A rivet feeding mechanism comprising a hopper having a passageway for rivets, a chambered feed wheel provided with a slotted rim face, means to rotate said feed wheel, said passageway leading into said chambered

feed wheel transverse to the rotation of said wheel, automatic means controlled by the mass of rivets in said wheel to regulate the feed of rivets into said wheel, and means to rotate said wheel.

8. A rivet feeding mechanism comprising a hopper and a rivet passageway leading from said hopper, a chambered feed wheel provided with a slotted rim face, said passageway leading into said chambered feed wheel, means to rotate said wheel intermittently, and automatic means at the end of said passageway to control the feed of rivets into said wheel by the mass of rivets in said wheel.

9. A rivet feeding mechanism comprising a hopper with a passageway for rivets leading from said hopper, a chambered feed wheel provided with a slotted rim face, said passageway leading into said feed wheel, a swinging gate controlling the end of said passageway, means to rotate said feed wheel, and means whereby the mass of rivets in said feed wheel operate said gate to control the feed of rivets through said passageway.

In testimony whereof I affix my signature.

EDWIN B. STIMPSON.