

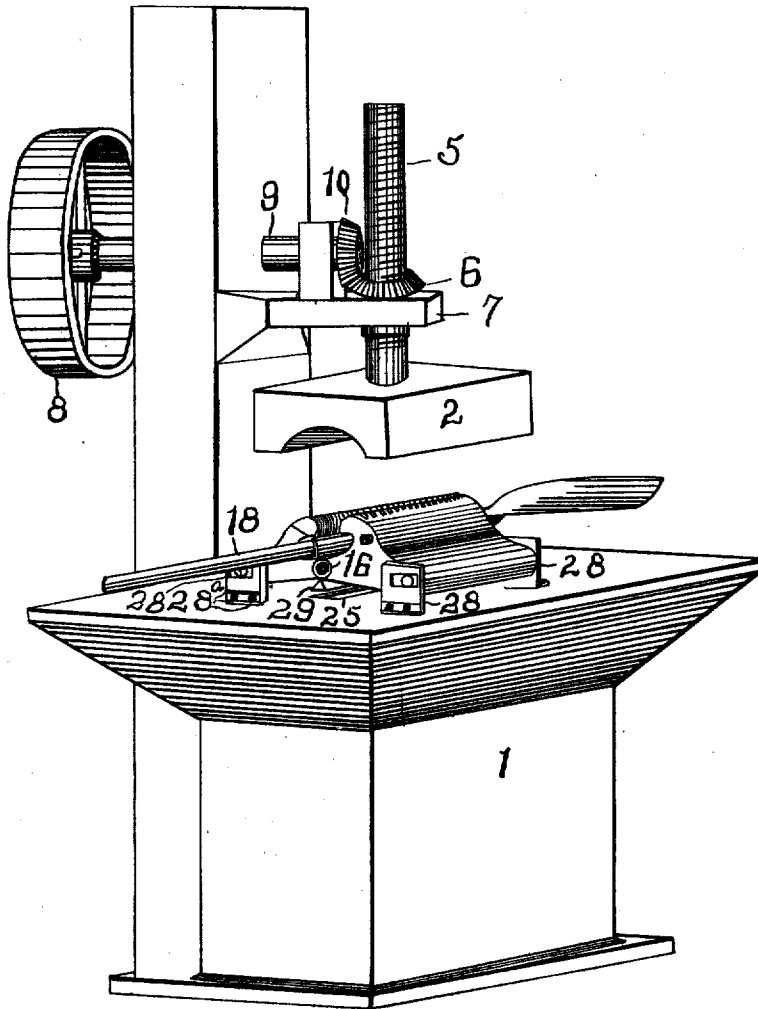
G. W. BENTON.
MECHANISM FOR CLOSING FERRULES.
APPLICATION FILED DEC. 19, 1910.

998,455.

Patented July 18, 1911.

3 SHEETS-SHEET 1.

Fig. I.



WITNESSES

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3 SHEETS—SHEET 2.

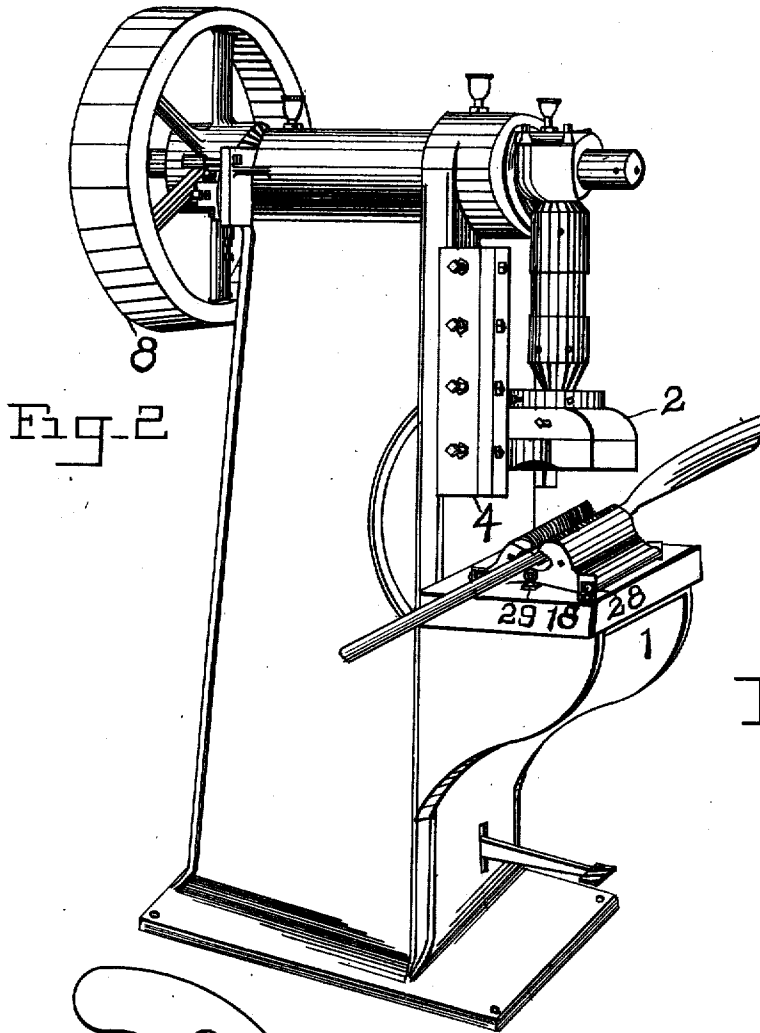


Fig. 2

Fig. 8.

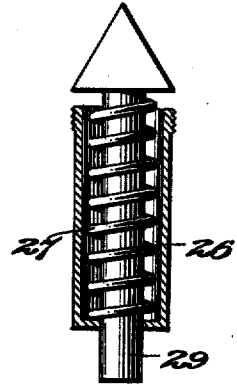


Fig. 9.

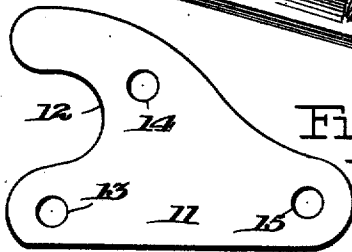
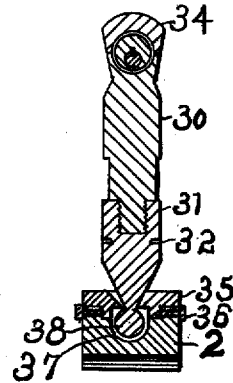


Fig. 6

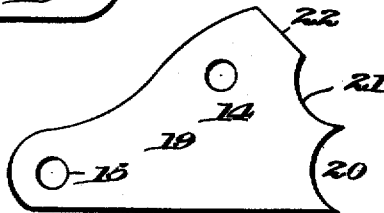


Fig. 7

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3 SHEETS—SHEET 3.

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Fig. 3.

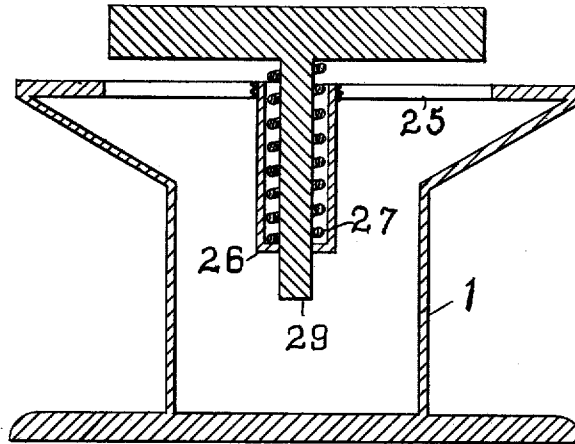


Fig. 4.

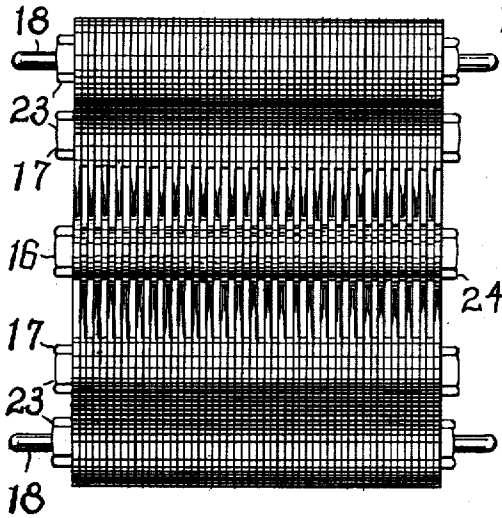
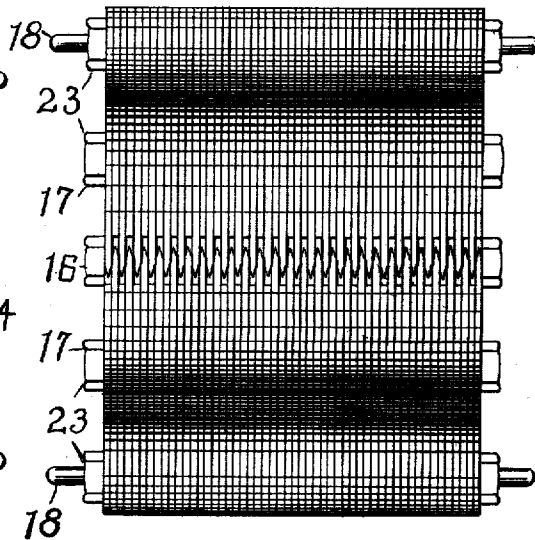


Fig. 5.



WITNESSES

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UNITED STATES PATENT OFFICE.

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MECHANISM FOR CLOSING FERRULES.

998,455.

Specification of Letters Patent.

Patented July 18, 1911.

Application filed December 19, 1910. Serial No. 598,133.

To all whom it may concern:

Be it known that I, GEORGE W. BENTON, a citizen of the United States, residing at Conneaut, in the county of Ashtabula and State of Ohio, have invented certain new and useful Improvements in Mechanism for Closing Ferrules; 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.

This invention relates to mechanism for closing the integral steel ferrules of open back shovels on the handles of the same. In practice the sheet of steel to be formed into said ferrule has been, usually, wrapped around the wood of the shovel handle, leaving a slight longitudinal opening at the back of the ferrule between the edges thereof. This opening has most often been rolled between rollers bringing such edges more or less perfectly together although closing jaws of some kind have occasionally been proposed as a substitute. The chief difficulty has been to get the ferrule to lie smoothly around the wood and come together evenly along the edges making a perfect and entirely closed casing for the round handle. To this end I provide a great number of hinged pairs of compression plates arranged parallel to each other with filler plates interposed between the proximate pairs, so that the compression will be applied to the ferrule at alternate short intervals on each side, throughout the length of the ferrule and further provide means for closing all the pairs of plates on the said ferrule, the pressure at the different points being thus exerted by distinct devices but in the same way and simultaneously, with the effect of pressing the opposed edges of the ferrule everywhere together, while the ferrule is also smoothed at every point by the neatly fitting shape and compressing action of the body of the compression plates.

My invention consists in the construction and combination of parts above indicated and divers details of improvement tending toward simplicity, durability, efficiency and cheapness in the mechanism.

In the accompanying drawings forming part of this application: Figure 1 represents a perspective view of a machine embodying my invention; Fig. 2, a similar view, the die being used in conjunction with the style of press actually used by applicant; Fig. 3, a

vertical longitudinal section through the spring casing, spring, T-bar and anvil; Fig. 4, a top plan view of the series of plates comprising the die in open position; Fig. 5 a similar view in closed position; Fig. 6 a detail of a compression plate; Fig. 7 a detail of a filler plate; Fig. 8 a detail of the T-rod and Fig. 9 represents a vertical sectional view through the weight 2, which is slightly reduced, the ball and socket joint, the members 30 and 31 of the adjustable rod and the eccentric and shaft.

Referring now in detail to the drawings, 1 designates the stand or frame, on the anvil of which my die is secured by means of bolts hereinafter referred to or any other suitable means. 2 designates the weight for forcing the die shut, said weight having its lower face concave to correspond or nearly correspond to the shape of the upper face of said die as assembled, so that it will have more surface to bear on and its stroke or force will be distributed over greater surface, doing no damage and giving better results.

As a convenient means for raising and lowering this weight 2 I have shown in the drawings a screw-threaded stem 5 attached thereto, a geared nut 6 engaging said screw, a fixed bracket 7 in which said nut may turn and a gear wheel 10 engaging said nut, a shaft 9 carrying said gear wheel and a hand wheel 8 on said shaft for turning the same. According to the direction of such turning the weight 2 ascends or descends as far as determined by such rotary movement. Vertical guides, one of which, marked 4 is shown in Fig. 2, are preferably used for said weight in its vertical movement.

In the style of machine shown in Figs. 2 and 9 the weight 2 is joined or secured to the female member 31 by means of a ball 38 which works in a socket 37 in said weight, said ball being held in said socket by means of the collar 35 and the bolts 36, which pass through the upper part of the weight and bite into the annular flange of said collar. The male member 30 of the connecting rod is secured on the eccentric by means of yoke 34 and is provided with an externally threaded extension which screws or turns into the correspondingly screw threaded recess in the female part, the latter being turned to adjust the position of the weight in relation to the die by means of a spanner fitted into recesses 32. The operation of these parts is clearly illustrated in Fig. 9.

The die proper is composed of a plurality of compression plates 11 and filler plates 19 arranged alternately, said plates being assembled in two sections, each containing the same number of plates. The compression plates (see Fig. 6) are of near triangular shape, having the corners rounded and the top curved or concaved. Their shorter inner faces are recessed to an extended semi-circular or near U-shape form as at 12 adapted to fit the curved side of the shovel ferrule, in order that said plates may hold, compress and smooth the same and provided with three holes 13 at the lower inner end for the hinge bolt 16 hereinafter referred to, 14 near the top for assembly bolt 17 and 15 near the outer end for pivoting bolt 18. Each of the two sections of series of plates presents an even curved face to the curved side of the ferrule, each compression plate being held in proper position by the assembly bolt 17 and the curved parts 12 fitting the ferrule.

The filler plates 19 are the same shape on the upper outer and lower edges, except that the lower edge is shorter and the inner edge is of different outline as will now be described. The lower part of the inner edge is recessed as at 20 from the lower edge up in arc outline of about 120 degrees, this arc being large enough to work around and form a bearing for the lower part of the inner edge of the opposing compression plate 11. From the upper point of said recess 20 said filler plates are again recessed in arc form as at 21, said arc corresponding in size to the outline of the recess 12 in the compression plates. From the upper part of said arc 21, which is of about 90 degrees, the filler plates have a slanting edge 22 which extends outward. This slanting edge 22 allows the top part of the inner edge of each compression plate 11 opposed to each filler plate 19 to extend slightly across the longitudinal center of the die and interleave, while the recess 20 above mentioned forms a bearing for the lower parts of the compression plates and likewise allows them to interleave and of course to extend slightly across the longitudinal center of the die. Each filler plate 19 is provided with holes 14 and 15 corresponding in position to the holes 14 and 15 in the compression plates 11.

Each of the halves or sections of the die above mentioned are assembled separately, but of course in relation to each other, a filler plate, for instance, being the first plate on the left hand end of one section and a compression plate the first plate on the left hand end of the other section. The plates then alternate on each section until the desired length of die be reached, fifty two plates to each half or section being shown in the accompanying drawings. Next the assembly bolt 17 and pivoting bolt 18 are run through

the holes 14 and 15 respectively and the nuts 23 turned on the screw-threads of said bolts. Of course any ordinary form of bolt, of sufficient length and of the right cross-sectional size might be used as an assembly bolt instead of the specific form shown. The nuts 23 are turned home tightly, holding all plates of each section firmly together in place. Next the two sections are fitted together, the tops and bottoms of the inner edges of the compression plates 11 of one section interleaving with the tops and bottoms of the inner edges of the compression plates 11 of the other section and the recesses 20 of the filler plates 19 forming bearings for the lower parts of the inner edges of said compression plates, a compression and a filler plate opposing each other throughout. When so fitted together the hinge bolt 16 is passed through the holes 13 of said compression plates and the nuts turned on its ends, tight enough to hold the parts in position, yet loose enough to allow of free hinging action of the two sections.

The assembly bolts 17 and the hinge bolt 16 shown in the drawings are merely bolts of a length corresponding to the size of die desired, round in cross section and corresponding in size to the size of the holes 14 and 13 respectively and provided with screw threads at each end to engage the threads of the nuts 23 and 24 respectively. The pivot bolts 18 correspond in construction to the assembly bolts 17 and the hinge bolt 16 with the exception that they are slightly longer and have a perfectly smooth and rounded part at and extending a little from each end to form pivots. Next to this smooth rounded portion they are screw-threaded to engage the screw-threads of the nuts 23 above referred to.

When the die proper has been assembled as above, right angle irons or brackets 28 provided with a hole in each member to receive the ends of the pivot-bolts 18, are fitted over the ends of the latter and bolted or screwed to the anvil 1. By means of bolts 18 the two sections of the die are pivoted at the sides, these pivots being supported by brackets 28; and these two sections are loosely connected together by bolt 16 passing through holes 13 of the individual plates at their permanently overlapping and interleaving inner corners.

The anvil above mentioned is provided with a longitudinal slot or opening 25 directly under the hinge bolt of said die, see Figs. 1 and 3. To the bottom of said anvil is secured in any suitable manner the spring casing 26 which holds a strong coil spring 27 and which is located in the middle of said anvil. Extending downward inside the coils of said spring is the stem of a T-rod 29 (see Figs. 1 and 3) the head of which is located at the longitudinal center of and ex-

tends the full length of said die proper. The spring 27 bears against the underneath of the head of said T-rod 29, forcing the same up through the slot 25 against the bottom of said die, keeping the same normally in open position.

The operation is as follows: The shovel handle and ferrule to be laid thereon are inserted in the normally open die, see Fig. 1, the belt-wheel 8 is then rotated, rotating shaft 9 and gear-wheel 10 which engages the gear of nut 6 and turns said nut, lowering said weight 2 which strikes the two sections of the die and forces the same together, counteracting the action of spring 27 and T-rod 29 and laying the ferrule smoothly and closely on the handle and bringing the edges of the ferrule tightly together. By reversing the direction of wheel 8 the weight 2 is now raised and the spring 27 forces the head of T-rod 29 up through slot 25, forcing the die proper to open upward on its hinge bolt 16, each section pivoting on its pivot bolt 18. It is to be noted that both the tops and bottoms of the inner edges of said compression plates 11 interleave, hence there is no defined line of separation of the two sections of the die when in the act of compressing and there is therefore no crack or opening into which any part of said ferrule can be forced or wrinkle, hence all of it must be laid smoothly and snugly around said handle, coming together evenly at the back of the handle.

It is of course perfectly obvious that minor changes may be made in the construction and general arrangement of the parts of my invention, the preferred form only of which is shown in the accompanying drawings and described in this application. Hence it is my desire to cover all such possible minor changes and other details in the accompanying claims forming a part of this application.

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

1. A series of compression plates individually and pivotally mounted and arranged in two opposing sections, in combination with means for closing both sections simultaneously on an intervening ferrule, to force its side edges together, the plates of each section being parallel to each other, adapted to fit the ferrule and interleaving with those of the opposite section.

2. A series of pairs of compression plates and intervening filler plates, pivoted for simultaneous and coöperative action on a ferrule and having curved faces adapted to fit on the opposite sides of a cylindrical ferrule, said series of pairs of plates being provided with means for closing the same.

3. A series of pairs of compression plates, in combination with a rod on which they

are pivoted, a plunger arranged to bear on said plates and force them together and a spring pressed bar for automatically opening the same.

4. A series of interleaving compression plates arranged in two opposing sections, which are independently pivoted and also pivotally connected together, in combination with means for closing them on a ferrule.

5. A series of interleaving compression plates arranged in two opposing sections which are individually pivoted, in combination with means for closing them all simultaneously.

6. A series of pairs of interleaving compression plates arranged in two pivoted opposing sections adapted to close on an intervening article and also to open again, in combination with means for closing them and means for automatically opening them.

7. A series of interleaving compression plates and filler plates arranged alternately and hinged together constituting two opposing sections of plates, the edges of which are curved to fit a shovel ferrule and presented evenly thereto, in combination with means for closing said compression plates on a ferrule and means for automatically opening said compression plates.

8. A series of pairs of interleaving compression plates and filler plates alternately arranged in two opposing sections, the plates of each section being pivoted together and all the compressing plates of both sections being pivotally connected for opening or closing and provided with curved edges for fitting on an approximately cylindrical ferrule, in combination with means for holding said plates normally in open position.

9. A series of pairs of interleaving compression plates, filler plates, said filler and compression plates alternating, and assembly and pivot bolts holding said plates firmly together, in combination with means for closing said plates.

10. A series of interleaving compression plates hinged together, in combination with a coil spring, a casing for said spring and a T-rod forced upward by said spring and bearing against the bottom of said plates to force the same to open upward.

11. A series of alternating compression and filler plates hinged together, said compression plates interleaving and each being opposed by a filler plate, in combination with a hinge bolt, assembly bolts holding said plates firmly in position in relation to each other and pivot bolts holding said plates firmly in position in relation to each other and forming pivots for said plates, in combination with means for closing said plates simultaneously and means for automatically and simultaneously opening said plates substantially as set forth.

12. A series of parallel individually mounted compression plates, composed of pivoted cooperating pairs of plates alternately arranged in two sections with projecting parts interleaving in their closed position.

13. A series of compression plates of similar form, mounted in two independently pivoted opposed sections connected by a rod, permitting opening and closing, the proximate individual plates of the two sections being arranged alternately, each plate having a curved operating face adapted to fit the side of the ferrule and the plates of each section presenting an even curved front to said ferrule substantially as set forth.

14. A series of pairs of compression plates arranged in two opposing sections, each plate being provided with a curved face adapted to fit on the side of a shovel ferrule and provided with three holes 13, 14 and 15 arranged as shown, in combination with a pair of stationary pivot-bolts passing through holes 15 of the plates in each of the two opposing sections of the series, a bolt passing through holes 13 of all the compression plates and permitting upward and downward play of said bolt for closing the plates and a pair of assembling bolts each passing through the holes 14 of the plates in one of the sections substantially as set forth.

15. A series of pairs of alternating compression plates, divided into two opposing sections of plates, alternately arranged and overlapping at their inner proximate parts, in combination with means for hinging them together at this point, means for holding the plates of each section in position to present an even front, means for pivoting the plates of each section together at fixed points

and means for operating the plates of the opposing sections to turn on these pivots for closing and opening the same, the common pivotal point of both sections simultaneously rising or descending.

16. A series of plates arranged in two pivoted sections, in combination with mechanism for closing them toward each other, each section consisting of compression plates and filler plates alternately arranged, each compression plate of one section being opposite a filler plate of the other section substantially as described.

17. A series of plates arranged in two pivoted sections, in combination with mechanism for closing them toward each other, each section consisting of compression plates and filler plates alternately arranged, each compression plate of one section being opposite a filler plate of the other section and provided with a part projecting over the same and beyond the central line of the die to interleave with the proximate compression plates of the other section substantially as set forth.

18. A die composed of two opposed members pivoted at each side and provided with projections at top and bottom, the projections of one member interleaving with the projections of the other member, in combination with a rod passing through the bottom projections and mechanism for closing and opening said members.

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses.

GEORGE W. BENTON.

Witnesses:

FRED L. HARTON,
R. H. DINNING.