

Fig: 1

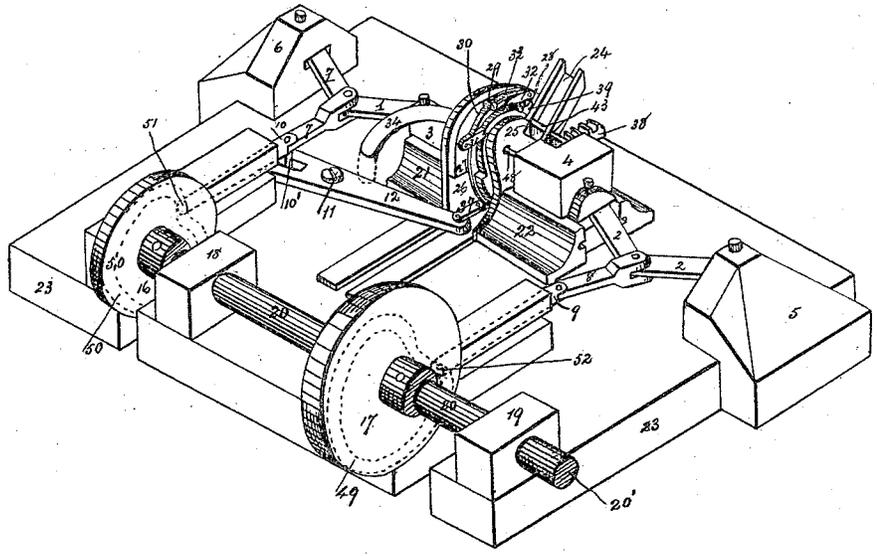
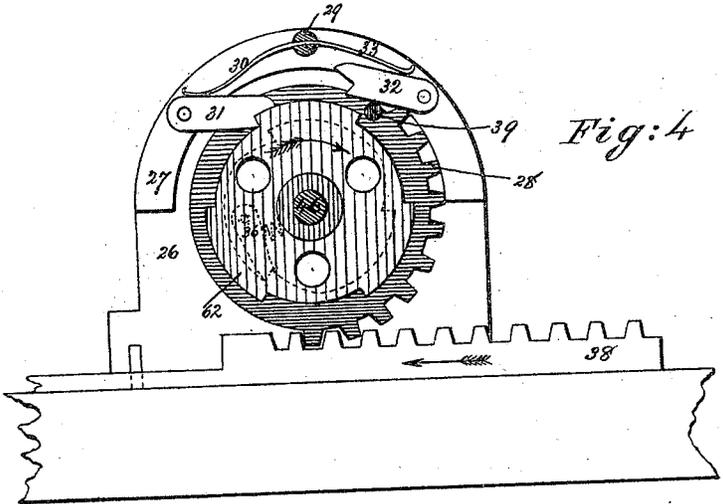


Fig: 4



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MANUFACTURE OF CARTRIDGE-CASES.
No. 172,333. Patented Jan. 18, 1876.

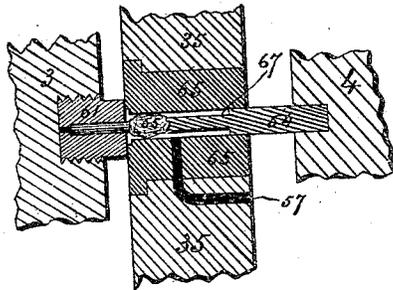


Fig: 2.

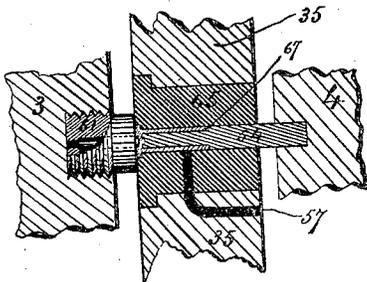


Fig: 3.

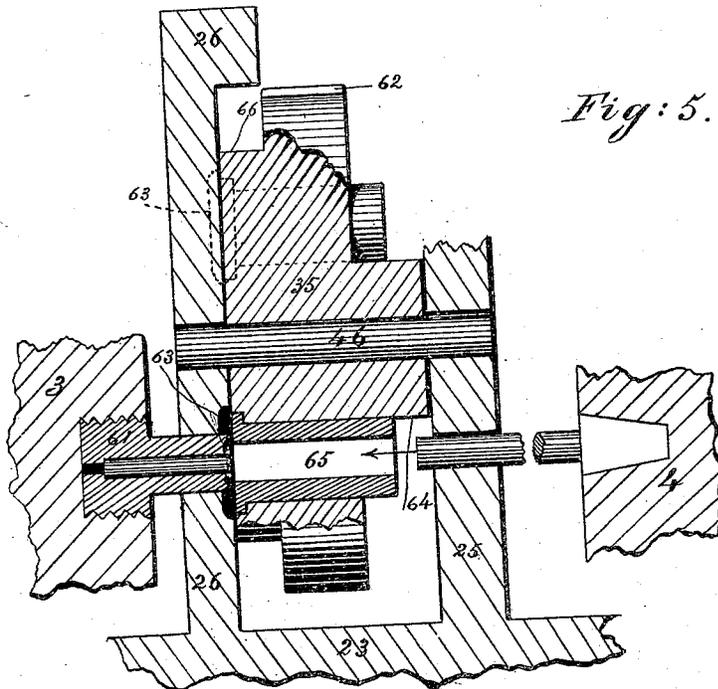


Fig: 5.

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IMPROVEMENT IN THE MANUFACTURE OF CARTRIDGE-CASES.

Specification forming part of Letters Patent No. **172,333**, dated January 18, 1876; application filed December 8, 1874.

To all whom it may concern:

Be it known that I, JOE V. MEIGS, of Lowell, in the county of Middlesex and State of Massachusetts, have invented a new and useful Improvement in the Art of Manufacturing Cartridge-Cases, of which the following is a specification:

It is the object of my invention to produce a complete cartridge-case from a lump or piece of metal. To do this, I provide a die, into which is fed the piece of metal to be formed into a case. The die is then presented, in line with a resisting-die, to a punch, which is forced into the die, and causes the metal to flow into the space between the punch and dies.

In the accompanying drawings, which show one construction of mechanism for carrying out my invention, Figure 1 is a view in perspective; Fig. 2, a section through the dies and punch, with a piece of metal in position to be formed into a case, the die-supports being omitted; Fig. 3, a similar view with the case formed; Fig. 4, an elevation of the inner side of the die-plate and the devices for actuating it; Fig. 5, a cross-section of the die-plate and its supporting-pieces, with the devices for operating it omitted.

In the arrangement of parts shown, a bed-plate, 23, carries upon it suitable boxes 18 and 19, in which a shaft, 20, revolves, the motion to which is imparted in any of the ordinary ways, such as by crank, gears, or belts, applied at 20', or at any suitable point. Keyed to the shaft are cams 16 and 17, for operating toggle-joints or levers 1 and 2, in this instance by means of jointed pitmen 7 10 and 8 9, the wrists 51 and 52 of the pitmen working in the slots 50 and 49 of the cams. These toggle-joints 1 and 2 are, respectively, pin-jointed or pivoted at their outer ends in stationary boxes 5 and 6, and their inner ends are connected with reciprocating or sliding heads 3 and 4, guided by ways 21 and 22 as they are reciprocated by the bending and straightening of the toggles. On the inner face of the reciprocating head 3 is fixed a resisting-die, 61, Figs. 2, 3, and 5, which may be adjustable. Stationary supporting-pieces 25 and 26 project from the bed-plate 23. Between these supports a die-plate, 35, is pivoted upon an axle, 46, supported in the pieces. The die-

plate is revolved by a sleeve-gear, 28, Fig. 4, into which a reciprocating rack, 38, moving in a suitable guideway, meshes. This rack is given its reciprocating motion, in this instance, by a lever, 12, linked to the rack at 37, Fig. 1, and rocked upon its fulcrum 11, which may be adjustable, by means of the pitman 10, acting through a pin, 10', upon the slotted end of the lever.

Fig. 5 shows the construction of the plate 35, one side of which is turned down, so as to form a shoulder, 66, around which the gear 28, Figs. 1 and 4, plays. Upon the outer periphery 62 of the die-plate a ratchet is formed. (Shown in Fig. 4.) Upon the supporting-piece 26 is a projecting shoulder, 27, to which are attached two pawls, 31 and 32, (see Fig. 4,) which are pressed upon the periphery of the die-plate, in this instance, by springs 30 and 33, attached to the supporting-piece at 29. Upon the die-plate, within the gear-sleeve 28, is a pawl, 36. (Shown in dotted lines, Fig. 4.) On the inner surface of the gear 28 (see dotted lines, Fig. 4) are cut ratchets equal in number to the dies used, into which the pawl 36 takes when the rack has been thrown to the limit of its outward motion, the rack thus partially revolving the sleeve-gear 28, and at the same time causing a pin, 39, projecting from the face of the gear to come in contact with the pawl 32, and disengage it from the die-plate. During the motion of the rack producing this action of the parts the pawl 31 prevents the die-plate from revolving accidentally, by friction or otherwise, with the gear. When the reverse motion of the rack takes place, in the direction of the arrow, Fig. 4, the pawl 32 having been raised, the internal pawl 36 in the die-plate having engaged the gear, said pawl moves with the gear, carrying the die-plate as the rack moves. The pin 29 being a part of the gear 28, and moving with it, retreats after having released the pawl 32, and the latter then descends upon the periphery of the die-plate ready to catch into the first ratchet presented to it, preventing the die-plate from turning too far from the impetus it may have attained. Thus a very great speed can be attained with absolute accuracy of the movement of the die-plate.

In this instance I have shown the die-plate

provided with three dies, which successively receive the lumps of metal to be made into a cartridge-case, carrying it to the point to be operated upon, and to the point of discharge, as will presently be explained.

The reciprocating-head 4 carries three punches, which are so arranged in relation to the dies in the die-plate that when the latter is stationary, the punches are always in line with the dies.

A trough, 24, or feed-channel, is attached to the support 25, so that the blanks fed through it are presented in line with the punch, which performs the office of inserting them, one at a time, into the die opposite the punch.

Fig. 2 shows the position of the shouldered flowing and heading punch 54, and dies 65 and 61, the former containing a lump of metal, 55, just before the operation of flowing the shell, by the closing of the toggle joint 2, Fig. 1.

In Fig. 3 the same parts are shown in the position they would occupy when the shell is completed, the shoulder 67 limiting the length of the shell. In case there should be surplus metal, its escape is provided for by one or more openings, 57, leading from the die; this surplus metal being cut off when the shell is ejected from the die.

When both toggles are bent, as in Fig. 1, the punches have just been withdrawn from the dies. In the next movement the toggle 1 commences to straighten; at the same time the rack 38 partially revolves the die-plate, bringing the dies in line with the punches, and by the straightening of the toggle 1 the sliding head 3, carrying a solid resisting-die, as shown at 61, Figs. 2, 3 and 5, is brought against the hollow die 65 in the die-plate containing the shell, forcing the dies firmly together and retaining them so while the punches are advanced by the straightening of toggle 2, one of the punches, in its passage through the feed-trough, inserting a case in the hollow die in line with it. The punch in line with the hollow die, against which the solid or resisting die has been brought, is at the same time advanced (all the punches being fixed in the same head) in the first part of its motion rapidly, and then gradually, by means of the cam-groove 49 in the cam 17, and forces the lump of metal (which had, by a previous motion, been inserted in the die) to flow into the sinuosities of the dies and punch shaped in the form of the outside and inside of the cartridge-case, filling the space between them. The toggles next are simultaneously bent, (at the same time the neck advances,) withdrawing the punches and resisting-die, the rack moving the gear into the position to take up the die-plate without moving the die-

plate (owing to the pawls and clutch mechanism heretofore described) preparatory to partially revolving it. The toggle 1 now closes, and at the same time the rack 38 is withdrawn, partially revolving the die-plate so as to bring the die containing the shell just formed opposite and in line with the ejecting-punch 48, Fig. 1. The toggle 2 now closes, pushing the shell just formed from the hollow die into a tube, 34, or other conveyance to a suitable receptacle; at the same time the inserting-punch 43, Fig. 1, passing through the trough, inserts a new lump in the hollow die which had previously been brought opposite the inserting-punch, the flowing and ejecting being simultaneously carried on, as each of the hollow dies becomes in turn the receiving-die, the flowing or heading die, and the die from which the case is ejected, by the successive partial revolutions of the movable die-plate. These operations are thus repeated indefinitely by the continuous revolution of the driving-shaft, which may have stop-motions suitable for this class of machine for arresting the operation of the machine at any desired moment.

When, as in Fig. 5, the face of the head is made in the resisting-die, the supporting-piece, against which the die-plate revolves, is cut away at 63, so as to permit of the passage of the head. This figure also shows a shoulder, 64, which surrounds the axle of the die-plate and abuts against the piece 25. Thus the die-plate, at this place, fills the space between its supporting-pieces. Obviously, the entire die-plate may be thickened so as to fill the space between its supports, thus giving greater strength and solidity. When the toggle connected with the sliding head 3 is straightened, it brings the solid or resisting die, as shown in this figure, against the face of the hollow die in the die-plate, which, being shouldered, cannot be displaced. The die-plate, by means of its hub 64, fills the space between its supporting-pieces, so that when the flowing-punch advances into the dies, there cannot be any separation of them. Thus the dies are securely held together during the great pressure required to make the shell.

I claim as my invention—

The improvement in the art of manufacturing cartridge-cases, hereinbefore set forth, which consists in flowing the metal into the desired shape by compression between a punch and dies.

In testimony whereof I have hereunto subscribed my name.

JOE V. MEIGS.

Witnesses:

JOSEPH I. PEYTON,
B. H. MORSE.