

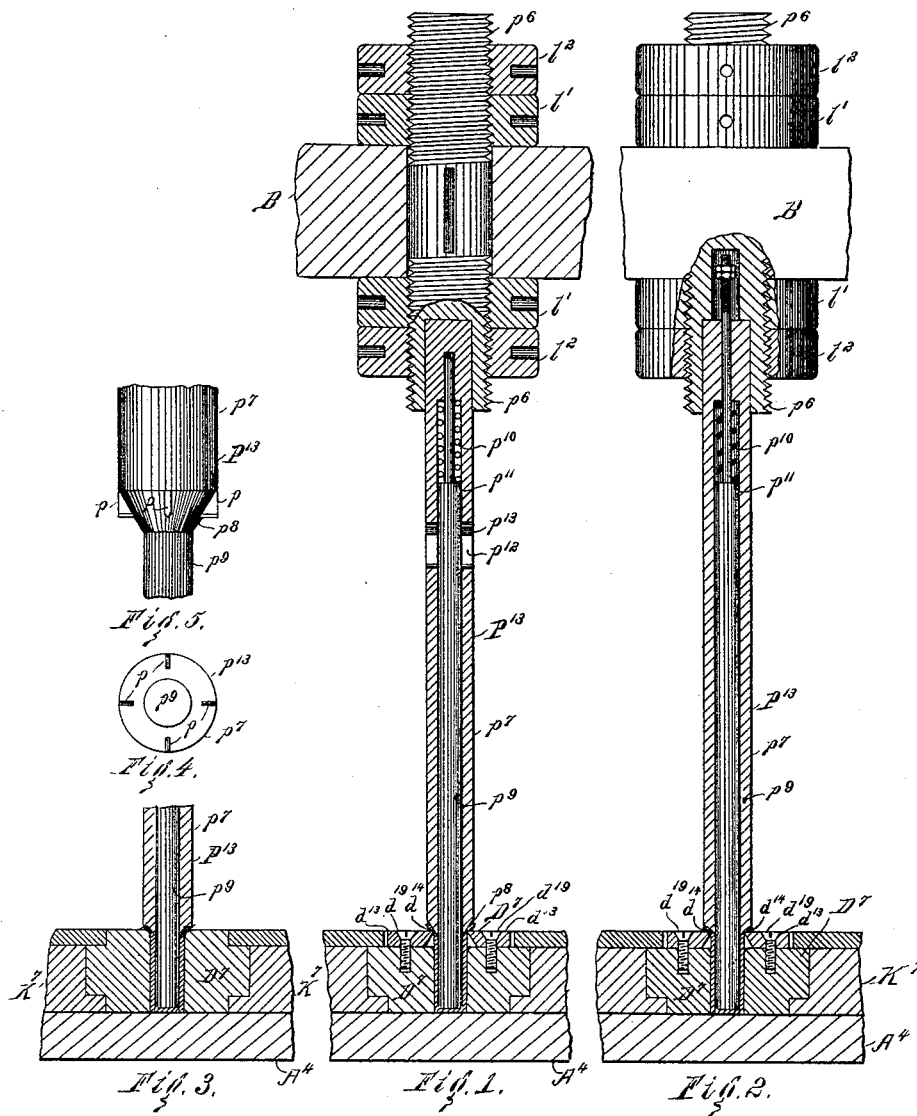
(No Model.)

R. WHITE.

PUNCH AND DIE FOR TRIMMING SHELLS.

No. 348,440.

Patented Aug. 31, 1886.



Witnesses.
Hirshley & Co.
M. A. Livingston.

Inventor.
Rollin White
By His Attorneys
Moore and White

UNITED STATES PATENT OFFICE.

ROLLIN WHITE, OF LOWELL, MASSACHUSETTS.

PUNCH AND DIE FOR TRIMMING SHELLS.

SPECIFICATION forming part of Letters Patent No. 348,440, dated August 31, 1886.

Application filed December 2, 1885. Serial No. 124,404. (No model.)

To all whom it may concern:

Be it known that I, ROLLIN WHITE, a citizen of the United States, residing at Lowell, in the county of Middlesex and Commonwealth of Massachusetts, have invented a certain new and useful Improvement in Punches and Dies, of which the following is a specification.

My invention relates to punches and dies adapted for cutting and trimming; and it consists in the means, hereinafter described, of cutting off the ragged ends of metallic tubes, and in means of determining the length of the finished tube.

In the accompanying drawings, Figure 1 is a vertical central section of my improved punch and die, and of the head in which and the nuts by which the same is secured, the upper part of the socket or holder of the punch being in elevation; Fig. 2, an elevation of a punch, a part of the head, the socket with its nuts and check-nuts, the die, and a part of the die-rail, the lower part of the socket and the punch and die being in section, being similar to Fig. 1, except that the inner rod is retained in place by nuts and check-nuts and the lower part of the outer sleeve or tube has a curved taper instead of a straight taper; Fig. 3, a vertical central section of the lower end of the punch and of the die, the punch being provided with splitting-knives, and the trimming-knife being in one piece with the body of the die; Fig. 4, an enlarged plan of the bottom, and Fig. 5 an enlarged side elevation of the lower end, of the punch shown in Fig. 3.

The punch and die hereinafter described is mainly designed to trim the open ends of metallic cartridge-shells previously drawn from sheet metal by suitable punches and dies, substantially as shown in an application for a patent for improvements in machines for making cartridge-shells, filed by me January 2, 1885, but may be used to trim the ends of other tubes. It is well known that in drawing such shells the open end of the tube is ragged and needs to be trimmed, and the blanks are drawn out long enough to allow of such trimming.

In Fig. 1 of the drawings, B represents a head or block, caused in practice to have a vertical reciprocating motion. In this head B is secured the socket or holder p^a of the punch, by any convenient means. In the

drawings this socket p^a is represented as provided at its ends with external screw-threads, which are engaged by nuts l' and check-nuts l'' , above and below the head.

The punch P^{13} preferably consists of an outer cylindrical tube, p^i , the upper end of which is rigidly secured in the socket p^a , and the lower end of which is tapered downward or beveled off at p^s , and within this outer tube a cylindrical rod, p^9 , adapted to move freely therein. The rod p^9 is reduced for some distance from its upper end to form a shoulder, p^{11} , and the reduced part of the rod is surrounded by a spiral spring, p^{10} , which is compressed between said shoulder and the upper closed end of its surrounding-tube p^i . The spring p^{10} tends to push the rod p^9 downward out of the tube p^i ; but this tendency is limited, and the rod is prevented from entirely leaving the tube by one or more vertical slots, p^{12} , in the walls of the tube, and a pin, p^{13} , driven into or through said rod and projecting therefrom into said slot or slots; or the reduced part p^9 may be extended up through the tube p^i and a nut and check-nut used to secure it in position, as shown in Fig. 2. By this means the play of the rod may be more easily adjusted than if the pin and slot were used. The object of the central rod and spiral spring is to crowd the blank shell into the trimming-die D^7 until the closed end of the blank touches the bottom of the die, and to do this before the blank is trimmed, thus gaging the length of the finished shell, also to act as a guide for the outer cylinder, P^7 . The trimming-die D^7 has (preferably, but, as will appear below, not necessarily) a separate trimming-plate, d^{13} , of steel, secured by screws d^{10} to its upper side, which plate d^{13} has an opening concentric with the die-opening, the opening in the trimming-plate being countersunk from below, so as to form the sides of said opening into cutting-edge or annular knife d^{14} . The shell having been pushed by the rod p^9 into the die until the closed end of the shell strikes the bottom of said die, which is here formed by a die-rail, A^4 , from over which the die may subsequently be removed, the outer tube continues to descend, and its tapered end enters and spreads the upper end of the shell outward against said knife d^{14} , thereby cutting off the ragged upper open end of the shell on a true line.

The die, after the shell is trimmed, is moved away from over the die rail A⁴, said die being supported in a rotary die-plate, K⁷, substantially as the dies shown in said previous application are moved, a part only of such die-plate being here shown, as it forms no part of this invention.

The punch and die shown in Figs. 1 and 2 will be sufficient to trim thin shells of copper, the difference between the punches in these figures being merely in the taper of the parts p⁸, the curved taper in Fig. 2 being adapted to spread the ragged end of the shell more than the straight taper shown in Fig. 1. For trimming very thick shells it is desirable to use the punch shown in Figs. 3, 4, and 5, which is precisely like that shown in Fig. 1, with the addition of two or more vertical radial splitting-knives, p, (four being shown,) which are secured to the tapering part p⁸ of the cylinder p⁷, and extend from the top of said tapering part for some distance down the same, but not far enough to touch the top of the die when the punch is down. These knives p have their cutting-edges at the bottom and serve to split the upper ragged edge of the shell or blank into as many parts as there are splitting-knives and thus facilitate the work of the tapering part p⁸ of the punch in spreading the ragged end against the annular knife d¹⁴.

The modified die shown in Fig. 3 differs from that shown in Figs. 1 and 2 only in that the trimming-plate is one piece with the body of the die and that the cutting-edge is a right angle instead of being an acute angle, these differences being formal rather than substantial. It will be seen that when the blanks are fed into the die by any suitable mechanism whereby they would be certain of being driven to the bottom of the die and retained during the operation of trimming, the inner rod, p⁹, could be dispensed with and the punch P¹³ alone used.

I claim as my invention—

1. The combination of a die and a punch, said punch being provided at a distance from its end as great as the thickness of said die with a downwardly-tapering enlargement, as and for the purpose specified.
2. The combination of a die and a punch, said punch being provided at a distance from its end as great as the thickness of said die with a downwardly-tapering conical enlargement, as and for the purpose specified.
3. The combination of a die, a punch, said punch being provided at a distance from its end as great as the thickness of said die with a downwardly-tapering enlargement, and the die-rail, as and for the purpose specified.
4. The combination of the trimming-die provided with an annular cutting-edge and a punch adapted to press the upper end of a shell outward against said cutting-edge to trim said shell, as and for the purpose specified.
5. The combination of the die provided with an annular cutting-edge around its die-opening, a tube tapered at its lower end, a rod sliding in said tube, and a spring compressed between said rod and the end of said tube, as and for the purpose specified.
6. The combination of the die provided with an annular cutting-edge around its die-opening, a cylindrical tube larger than said die-opening and tapered at its lower end and provided with one or more slots in its walls, a cylindrical rod adapted to slide freely in said tube, a spring arranged to crowd said rod endwise out of said tube, and a pin driven into said rod and projecting outward into said slot or slots, as and for the purpose specified.
7. The combination of the punch provided with longitudinal knives and a die, as and for the purpose specified.

ROLLIN WHITE.

Witnesses:

ALBERT M. MOORE,
HERBERT R. WHITE.