

No. 846,304.

PATENTED MAR. 5, 1907.

J. F. HARDY.
PUNCH.

APPLICATION FILED MAR. 15, 1905.

Fig. 2.

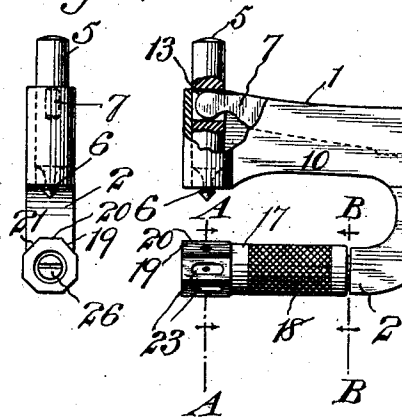


Fig. 1.

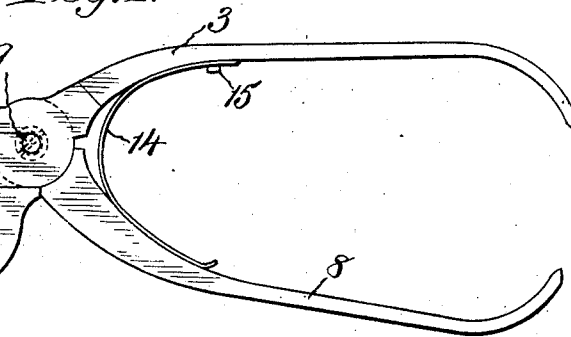


Fig. 3.

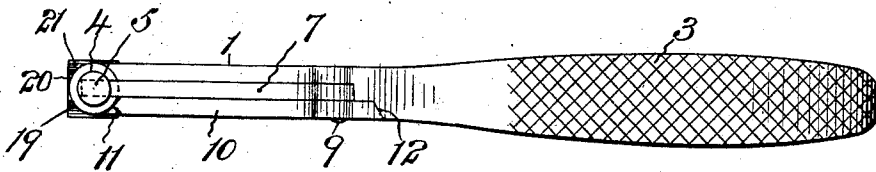


Fig. 4.

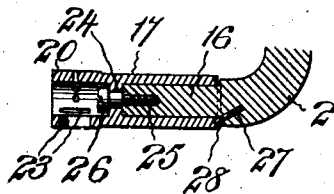


Fig. 5.

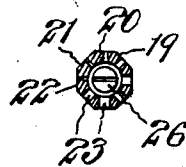
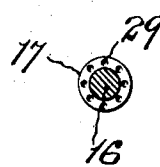


Fig. 6.



Witnesses:
J. George Barry.
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Inventor:
James F. Hardy
By Brown & Howard
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UNITED STATES PATENT OFFICE.

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PUNCH.

No. 846,304.

Specification of Letters Patent.

Patented March 5, 1907.

Application filed March 15, 1905. Serial No. 250,238.

To all whom it may concern:

Be it known that I, JAMES F. HARDY, a citizen of the United States, and a resident of the borough of Manhattan, in the city and State of New York, have invented a new and useful Punch, of which the following is a specification.

My invention relates to a punch, and more particularly to a punch for use by dentists in punching holes in sheets of rubber, known as "rubber dam."

The object is to provide a simple, durable, and convenient punch which shall be effective for the purposes for which it was intended.

In the accompanying drawings, Figure 1 is a view of the punch in side elevation, partly broken away to show the connection of the swinging handle with the punch-stem. Fig. 2 is a view in end elevation. Fig. 3 is a top plan view. Fig. 4 is a view in longitudinal section through the lower jaw and die or platen. Fig. 5 is a section in the plane of the line A A of Fig. 1, and Fig. 6 is a section in the plane of the line B B of Fig. 1.

A pair of jaws 1 and 2 are formed integral with or fixed permanently to a handle 3. The upper jaw 1 has in its head a vertical socket 4 in which the shank 5 of the punch 6 reciprocates. The shank 5 is preferably made considerably larger than the punch and is conveniently cylindrical in form and has an accurate vertically-sliding fit on the socket 4 for the purpose of moving the punch directly toward and away for the hole in the die.

The punch is operated by the arm 7, forming an extension of the handle 8, which is grasped by the hand simultaneously with the handle 3, the said handle 8 and arm 7 being pivoted at 9 to that member, which includes the jaws 1 and 2 and the handle 3.

It is intended that the arm 7 shall occupy a position about centrally of the jaw 1, and for convenience in assembling the parts the jaw 1 is provided with a removable cheek-piece 10, which after the arm 7 is in position is caught at one end under the beveled shoulder 11 and at its opposite end is drawn snugly in contact with the beveled shoulder 12 by means of the pivoted screw 9.

The arm 7 has its extreme end rounded

and extended into a slot 13 in the punch-shank 5, as clearly shown in Fig. 1.

The handles 3 and 8 are held normally apart with the punch withdrawn from the die by means of a flat spring 14, arched between the two handles and connected with the handle 3 at 15 and having a sliding engagement at its opposite end with the handle 8.

The lower jaw 2 is provided with a reduced cylindrical end 16, on which the die-cylinder 17 is mounted in rotary adjustment. The die-cylinder 17 has the exterior of its body portion knurled, as shown at 18, for receiving the thumb and finger of the operator to rotate it on the bearing 16, which it is intended to accurately fit. The said die-cylinder 17 is provided at its outer end with flat faces, in which are formed holes for the reception of the point of the punch, the wall of the hole at its upper end serving to coact with the face of the punch to cut out a portion of the rubber sheet.

In the present instance the die-cylinder 17 is made octagonal on its exterior, four of these faces, denoted by 19, 20, 21, and 22, (see Fig. 5, being each provided with a hole of different size from that of its neighbor, thereby giving a choice of four different-sized holes in punching, while the faces opposite these faces 19 20 21 22 are each provided with an elongated opening 23 for the purpose of introducing a tool to finish and enlarge, if necessary, the inner ends of the die-holes in the faces 19 to 22, inclusive.

It is intended that the die-cylinder 17 shall be of such length as to leave the die-faces 19 to 22, inclusive, extended beyond the end of the bearing 16, so that the chips may be readily removed from its interior after passing through the die-holes, and in order to hold the die-cylinder 17 in position on the bearing 16 I provide its interior bore with an inwardly-projecting annular ring 24 and tap a screw 25 into the end of the bearing 16, the head 26 of the screw being sufficiently large to overlap the ring 24, and so hold the die-cylinder against longitudinal displacement on the bearing.

To hold the die-cylinder temporarily in adjustment with some one of the holes 19 to 22, inclusive, directly below the center of the

punch 6, I tap a hole 27 in the jaw 2 in the face of the shoulder at the inner end of the reduced portion or bearing 16 of the jaw, and in this I locate a spring-actuated pin 28, the end of which is adapted to enter some one of the depressions 29 formed in the inner end of the die-cylinder 17. (See Fig. 6.) These depressions 29 are so deep as to form a positive lock against the rotation of the die-cylinder, but are saucer-like in shape, and the end of the pin 28 is rounded, so that they will hold the die-cylinder in its adjustment until the latter is forcibly turned by the operator.

The punch has the advantage of presenting a die-surface which is comparatively small and over which the rubber may be readily and smoothly turned by two fingers on one hand of the operator, while the other hand of the operator grasps the handles of the punch and performs the work of punching, and it also presents the desired-sized hole where it cannot be mistaken for a hole of different size, as the hole which is in operative position is the uppermost one, and the others are plainly and unquestionably out of operative position and, further still, the punch is moved in a right line and accurately toward and away from the holes in the die-plate, while two jaws or branches only are exposed to view, between which the rubber to be punched is to be placed. The spring-actuated retaining-pin is also so located that it does its work effectively and yet is perfectly housed, and the hole for seating it is conveniently tapped and the pin held in position by the locking of the die-cylinder in its position.

The die is so arranged that it may be conveniently cleansed on its interior and exterior, and the punch as a whole presents a neat and attractive appearance.

What I claim is—

1. A punch for rubber dam comprising a pair of stationary jaws, a punch mounted in one of the jaws to move in a right line, a punch-operating arm housed in and pivotally secured to one of the stationary jaws, a die-cylinder mounted in rotary adjustment on the other of the stationary jaws and projecting beyond the end of said jaw, the said die-cylinder being provided with radial die-holes in that portion which projects beyond the end of the jaw.

2. A punch for rubber dam comprising a pair of stationary jaws, a punch mounted in one of the jaws to move in a right line, a punch-operating arm housed in and pivotally secured to one of the stationary jaw, a die-cylinder mounted in rotary adjustment on the other of the stationary jaws and projecting beyond the end of said jaw, the said die-cylinder being provided with radial die-holes of different sizes in that portion which projects beyond the end of the jaw.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 13th day of March, 1905.

JAMES F. HARDY.

Witnesses:

H. D. BULTWAN,
JAMES MURRAY.