No. 696,745. Patented Apr. 1, 1902.

H. O'BRIEN.

PUNCH CHUCK.

(Application filed May 16, 1901.)

(No Model.)

Fig. 1.

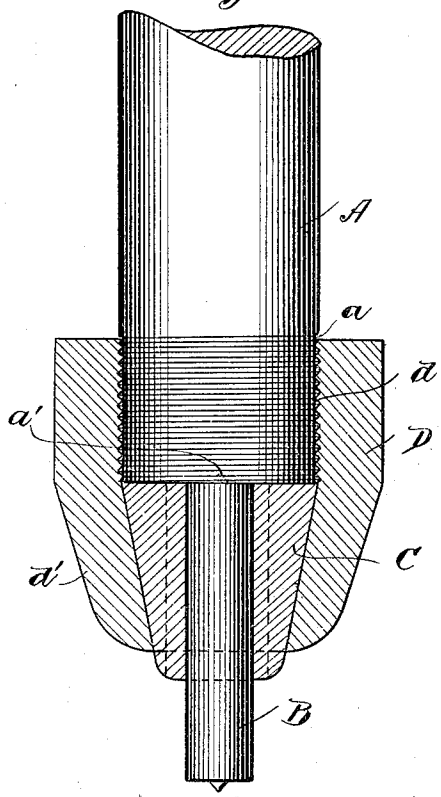


Fig. 3.

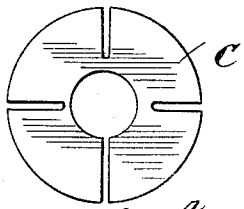


Fig. 4.

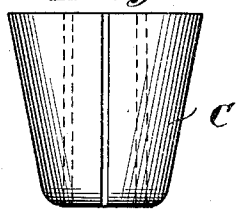
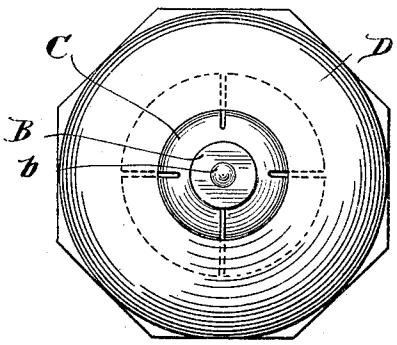


Fig. 2.



Witnesses,
F. D. Mann,
S. N. Fond.

Inventor,
Hugh O'Brien
By Offield, Dowle & Luthicum
Atty's.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

HUGH O'BRIEN, OF CHICAGO, ILLINOIS.

PUNCH-CHUCK.

SPECIFICATION forming part of Letters Patent No. 696,745, dated April 1, 1902.

Application filed May 16, 1901. Serial No. 60,514. (No model.)

To all whom it may concern:

Be it known that I, HUGH O'BRIEN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Punch-Chucks, of which the following is a specification.

My invention relates to punch-chucks, and refers more particularly to chucks of that class adapted for holding punches employed for the perforation of sheet metal and the like; and the salient object of the invention is to provide a chuck especially adapted to coöperate with a cylindric form of punch of reversible construction and operating both to facilitate the insertion within and disengagement from the chuck of the punch and to hold the punch firmly and securely against both lateral and endwise strain when in operation.

The invention also has in view the production of a simple and durable device of the character referred to capable of being cheaply and readily manufactured.

To these ends my invention resides in an improved punch-holding chuck constructed and adapted to operate in the manner hereinafter described, and more particularly pointed out in the claim.

My invention is illustrated in the accompanying drawings, in which—

Figure 1 is a view in central vertical section broken away at the top, of my improved punch-holding chuck, a punch being shown in position therein. Fig. 2 is a bottom plan view of the same. Figs. 3 and 4 are top plan and side elevational views, respectively, of the split sleeve forming one element of the holder.

My invention, as herein shown, comprises three elements, to wit: a main shank or ram A, a holding-sleeve C for the punch B, and an external binding-sleeve D.

The form of punch for which the present chuck is especially adapted comprises a short preferably cylindrical straight rod or bar of hardened and tempered steel, preferably of uniform diameter and having formed at each end thereof and centrally of the squared face constituting such end a small cone-shaped point *b*, the purpose of which is to afford a preliminary engagement of the punch with the sheet metal or other material subjected to the punching operation and fix the latter securely relatively to the punch before the main punching operation takes place, whereby a clean-cut and clearly-defined hole may be formed in the material without any slipping or sliding of the operative face of the punch on surface of the material engaged thereby.

The punch B is held in operative relation to the ram A by means of the split external tapered holding-sleeve C and the external clamping-sleeve D, this latter being internally threaded, as at *d*, through substantially the upper half of its length to engage a corresponding external thread *a* on the lower end of the ram A. The lower portion of the clamping-sleeve D is internally tapered to fit the corresponding taper of the holding-sleeve C, and the outer surface of the lower end of the sleeve D may also preferably taper, as at *d'*, to avoid unnecessary material and weight and conduce to the attractive appearance of the device as a whole.

The lower face of the ram A is conically recessed, as at *a'*, concentrically with the longitudinal axis of the ram in order to receive the points *b* on the engaging faces of the punch proper.

The assembling and operation of the parts are obvious from the illustration and foregoing description, but may be briefly described as follows: The punch B being placed against the lower face of the ram, with its coinciding point *b* entering and registering with the recess *a'* in the ram, the holding-sleeve C is slipped thereover, and the clamping-sleeve D is then passed over the assembled punch and holding-sleeve and screwed onto the lower end of the ram. By reason of the engagement of the relatively tapered external and internal surfaces of the sleeves C and D, respectively, the continued screwing of the latter upon the ram A clamps the split holding-sleeve C about the punch B, thus holding the same laterally in a secure manner. By reason of the direct engagement of the upper end of the punch with the lower end of the ram the force of the downward thrust of the latter is imparted directly to the punch without any sliding frictional strain between the punch and its holding-sleeve C.

I am aware that holding and clamping sleeves generally similar to those herein de-

scribed are old in connection with the mandrels and chucks of turning-lathes and the like. The peculiar construction of the chuck herein described is, however, novel in the combination hereinafter claimed.

The engagement of the point *b* on the face of the punch with the recess *a'* in the lower face of the ram insures the coaxial relation of the punch and ram during the operation of the punch, preventing lateral shifting or play of the punch in its holder due to a loose fit of the punch in the chuck or any looseness of the chuck relatively to the ram itself. Such coaxial registration of the punch and its holder cannot be secured or insured where the meeting faces of the punch and the ram are simply plain surfaces in flat contact with each other.

From the foregoing it will be seen that the holding-chuck is equally adapted to support either end of the punch proper, and by the use of a double-ended punch, as described, I practically double the life and usefulness of punches of this character.

In my invention when the lower working end of the punch, as shown in the drawings, becomes too dull or worn for reliable service the clamping-sleeve D is simply loosened, the punch B withdrawn, inverted, and replaced, the clamping-sleeve D is then turned up, and the punch is again ready for use in as good condition as if a new punch had been substituted in the chuck.

I claim as my invention—

A holding-chuck comprising a split compressible sleeve having a cylindric interior and conical exterior, and provided at intervals around its periphery with longitudinally-extending, radially-disposed cuts or slots extending the full length of said sleeve, and whereby the latter is rendered capable of compression to grip a cylindric body inserted therein, a ram arranged to abut against the upper end of said sleeve, and externally threaded at its lower end, a clamping-sleeve threaded upon the lower end of said ram and provided with a conical interior adapted to cooperate with the exterior of the holding-sleeve, the end of the ram being adapted to act directly against the end of a punch having a centering-point coincident with its longitudinal axis, and a recess formed in the end of said ram adapted to receive such centering-point, substantially as described, and for the purpose set forth.

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

HUGH O'BRIEN.

Witnesses:

SAMUEL N. POND,

FREDERICK C. GOODWIN.