No. 658,187. Patented Sept. 18, 1900.

H. & O. MOHR.

DRAW PRESS.

(Application filed June 13, 1900.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 3.

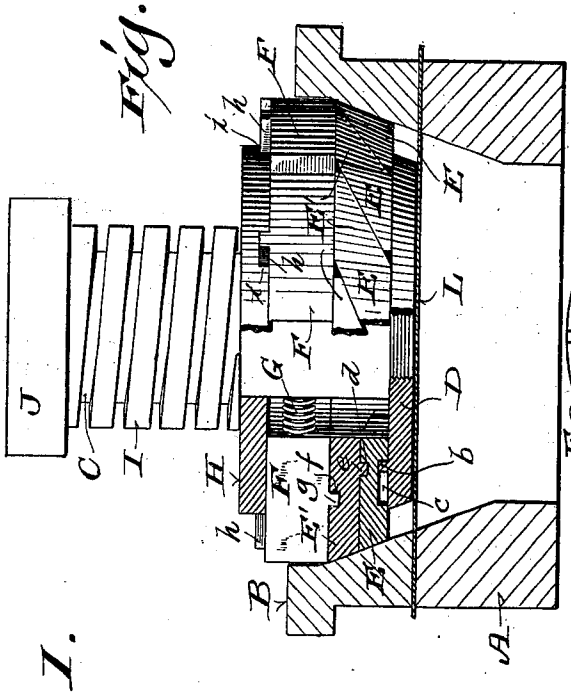


Fig. 4.

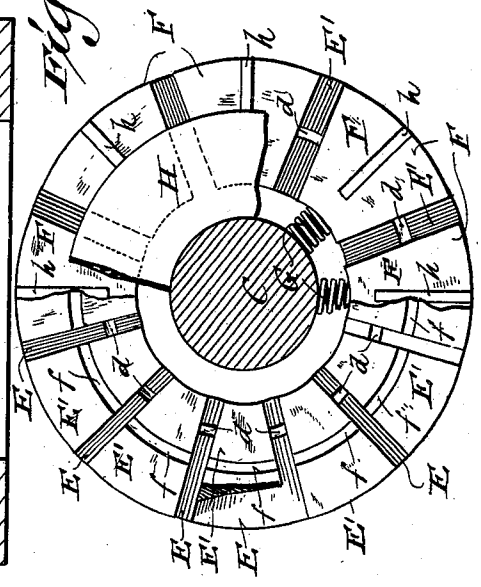


Fig. 1.

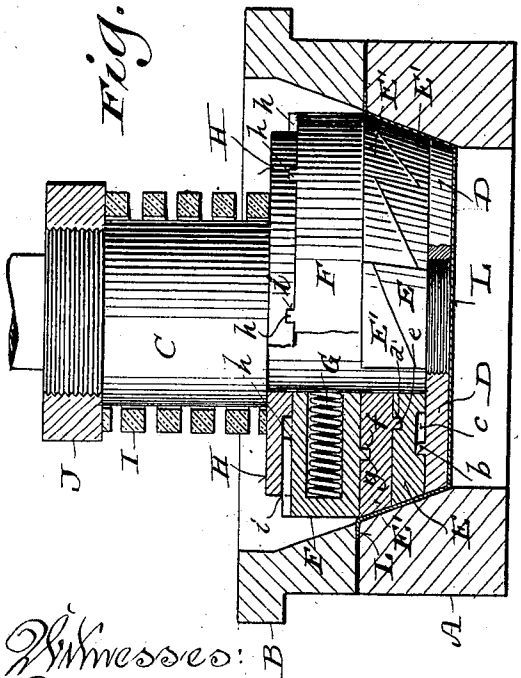
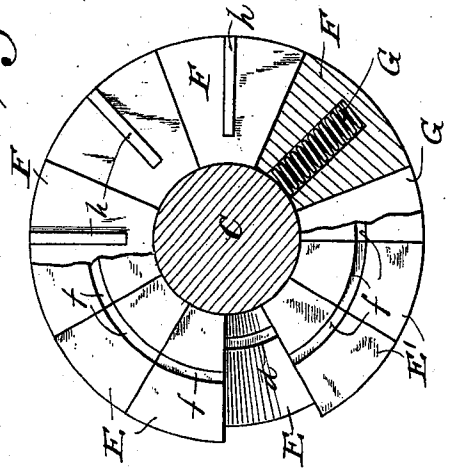


Fig. 2.



Witnesses:
Geo. W. Young.
W. E. Oliphant

Inventors:
Henry Mohr.
Otto Mohr.
By H. G. Underwood.
Attorney

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

No. 658,187. Patented Sept. 18, 1900.

H. & O. MOHR.

DRAW PRESS.

(Application filed June 13, 1900.)

(No Model.) 2 Sheets—Sheet 2.

Fig. 15.

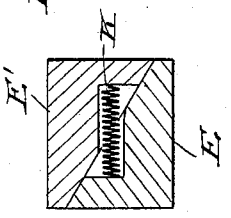


Fig. 11.

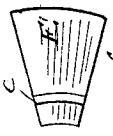


Fig. 12.



Fig. 13.



Fig. 14.

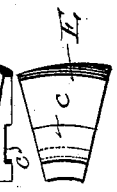


Fig. 7.

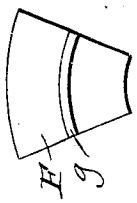


Fig. 8.

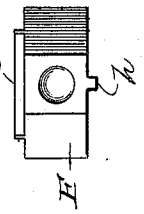


Fig. 9.

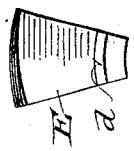


Fig. 10.



Fig. 5.

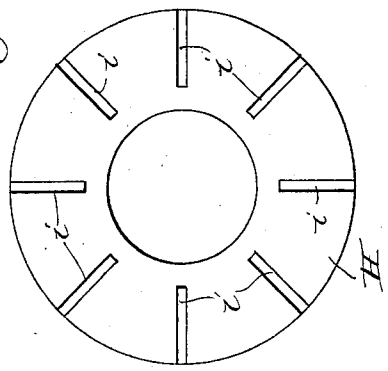
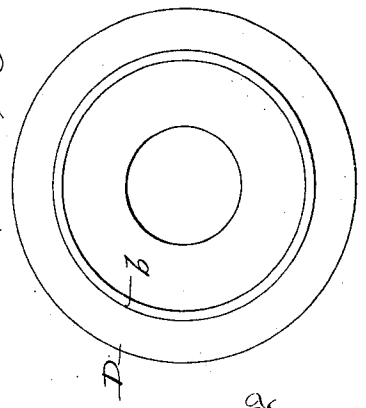


Fig. 6.



Witnesses:
Geo. W. Young.
N. E. Oliphant.

Inventors
Henry Mohr
Otto Mohr
By H. G. Underwood.
Attorney

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

UNITED STATES PATENT OFFICE.

HENRY MOHR AND OTTO MOHR, OF MILWAUKEE, WISCONSIN.

DRAW-PRESS.

SPECIFICATION forming part of Letters Patent No. 658,187, dated September 18, 1900.

Application filed June 13, 1900. Serial No. 20,132. (No model.)

To all whom it may concern:

Be it known that we, HENRY MOHR and OTTO MOHR, citizens of the United States, and residents of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Draw-Presses; and we do hereby declare that the following is a full, clear, and exact description thereof.

Our invention has for its object to prevent wrinkling of sheet metal operated upon by a draw-press to produce a taper-body product; and it consists in certain peculiarities of construction and combination of parts hereinafter particularly described with reference to the accompanying drawings and subsequently claimed, especial reference being had to the contractile punch herein set forth.

Figure 1 of the drawings is for the most part a representation of a vertical transverse section of so much of a sheet-metal draw-press as involves a die, blank-holder, and contractile punch, this punch having been run down in said die against interposed sheet metal to form a taper-body product, that is also shown in section; Fig. 2, a plan view of the punch, partly broken and in horizontal section on planes beneath its top plate, said punch being contracted; Fig. 3, a view similar to Fig. 1, illustrating the punch expanded and on downstroke at the time it comes in contact with the blank from which a taper-body product is formed; Fig. 4, a plan view of the punch expanded, partly broken and in horizontal section on a plane above its top plate; Fig. 5, a plan view of said top plate inverted; Fig. 6, a plan view of the bottom plate of the punch; Fig. 7, a plan view of a radial straight-face spring-block section of the punch inverted; Fig. 8, an inner end elevation of the inverted spring-block section; Fig. 9, a plan view of the lower one of a pair of radial taper-face sections of the punch that match each other on a bevel; Fig. 10, an inner end elevation of a pair of the taper-face sections of the punch; Fig. 11, a plan view of an upper one of a pair of the taper-face sections inverted; Fig. 12, a side view of a pair of said taper-face punch-sections; Fig. 13, a similar view of the lower one of a pair of the aforesaid taper-face punch-sections; Fig. 14, a plan view of the same inverted; and Fig. 15, a sectional view of a pair of the taper-face punch-sections contracted against a spiral spring, these punch-sections being made to incase said spring.

Referring by letter to the drawings, A represents the die, and B the blank-holder, of a draw-press for making taper-body sheet-metal products, the general construction and arrangement of these parts being that ordinarily employed in presses of the kind specified, except that the bore of the blank-holder is tapered to match the die.

The punch of the press comprises a cylindrical shank C, an annular taper-face bottom plate D, a series of radial taper-face sections E E′, arranged in pairs, those in each pair being in bevel-match contact with each other, a series of radial straight-face blocks F, containing shank-abutting spiral springs G, an annular top plate H, a spiral spring I of considerable power surrounding the shank above said top plate, and a tension-collar J in screw-thread connection with said shank against the latter spring. The bottom plate D is in screw-thread connection with the lower end of shank C against a shoulder of said shank and provided upon its upper side with an annular flange *b*, engaging bottom recesses *c* in the taper-face sections E, these recesses being wider than said flange, whereby said sections may have limited radial play on said bottom plate. Upper grooves *d* in the taper-face sections E, concentric with shank C, are engaged by corresponding tongues *e*, depending from taper-face sections E′ in bevel-match contact with those aforesaid. The taper-face sections E′ are also provided with upper grooves *f*, concentric with shank C, and corresponding tongues *g*, depending from the spring-incasing straight-face blocks F, engage the latter grooves. Upper radial tongues *h* on blocks F engage corresponding grooves *i* in the under side of the top plate H of the punch, and the spring I, under tension, operates to bind the several tongue-and-groove-connected parts of said punch in frictional contact.

In practice expansive force of the radially-disposed springs G, operating against the straight-face radial blocks of the punch, causes an outward movement of these blocks when said punch is clear of die A, and by this move-

ment of said blocks the taper-face sections of said punch are also moved in an outward direction as far as the flange *b* on the bottom plate will permit. When the outward radial movement of the taper-face sections of the punch takes place, the expansive force of spring I will cause each pair of said sections to slip one upon the other, because of their bevel-match contact, and thus prevent gaping of the punch as the diameter of the taper portion of said punch increases. The slip movement of each pair of the bevel-match taper-face punch-sections may be facilitated by the expansive force of a spiral spring K, incased in recesses of said sections, as shown in Fig. 15, the recesses being in the direction of the bevel. To prevent injurious contact of the taper-face punch-sections with sheet metal opposed thereto in the die A, the lower edges of said sections in each pair are rounded.

The punch is normally expanded and automatically contracts against resistance of its several springs when moved in the direction necessary to draw a sheet-metal blank L into the taper die A of the press, the contraction being gradual in proportion to the taper of the die, whereby a smooth taper-body product is obtained. The contraction of the punch begins in the taper holder B at the time the bottom plate of said punch comes in contact with the blank L between said holder and die A, as shown in Fig. 2, the limit of contraction being had when the sheet metal is drawn the full depth of the die-taper or when the faces of said bottom plate and punch-sections E E′ are flush.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a draw-press, the combination of a taper die and blank-holder with a contractile punch comprising a shank, an annular taper-face plate on the shank, a series of taper-face sections arranged in pairs those in each pair being in bevel-match and movable radially on said plate, a corresponding series of spring-controlled blocks in union with the paired taper-face sections, a shank-fitting loose plate with which said blocks have radially-movable connection, and a spiral spring under tension around said shank against the latter plate.

2. In a draw-press, the combination of a taper die and a blank-holder with a contractile punch comprising a shank, an annular taper-face plate on the shank, a series of taper-face sections arranged in pairs, those in each pair being in bevel-match spring-controlled union and movable radially on said plate, a corresponding series of spring-controlled blocks in union with the paired taper-face sections, a shank-fitting loose plate with which said blocks have radially-movable connection, and a spiral spring under tension around said shank against the latter plate.

3. In a draw-press, the combination of a taper die and blank-holder with a contractile punch comprising a shank, an annular taper-face plate on the shank, a series of taper-face sections arranged in pairs, those in each pair being in bevel-match union and those opposing said plate having flange-and-recess engagement with the same to be radially movable thereon, a corresponding series of radially-recessed blocks in union with the paired taper-faced sections, spiral springs in the block-recesses abutting the shank, a shank-fitting loose plate having radial tongue-and-groove connection with the blocks, a spiral spring surrounding said shank against the latter plate, and a spring-opposing tension-collar in screw-thread engagement with the aforesaid shank.

In testimony that we claim the foregoing we have hereunto set our hands, at Milwaukee, in the county of Milwaukee and State of Wisconsin, in the presence of two witnesses.

HENRY MOHR.
OTTO MOHR.

Witnesses:
N. E. OLIPHANT,
B. C. ROLOFF.