No. 805,967. PATENTED NOV. 28, 1905.

J. L. KELLY.

DRAW PRESS FOR SHEET METAL.

APPLICATION FILED MAR. 24, 1904.

2 SHEETS—SHEET 1.

Fig. 1.

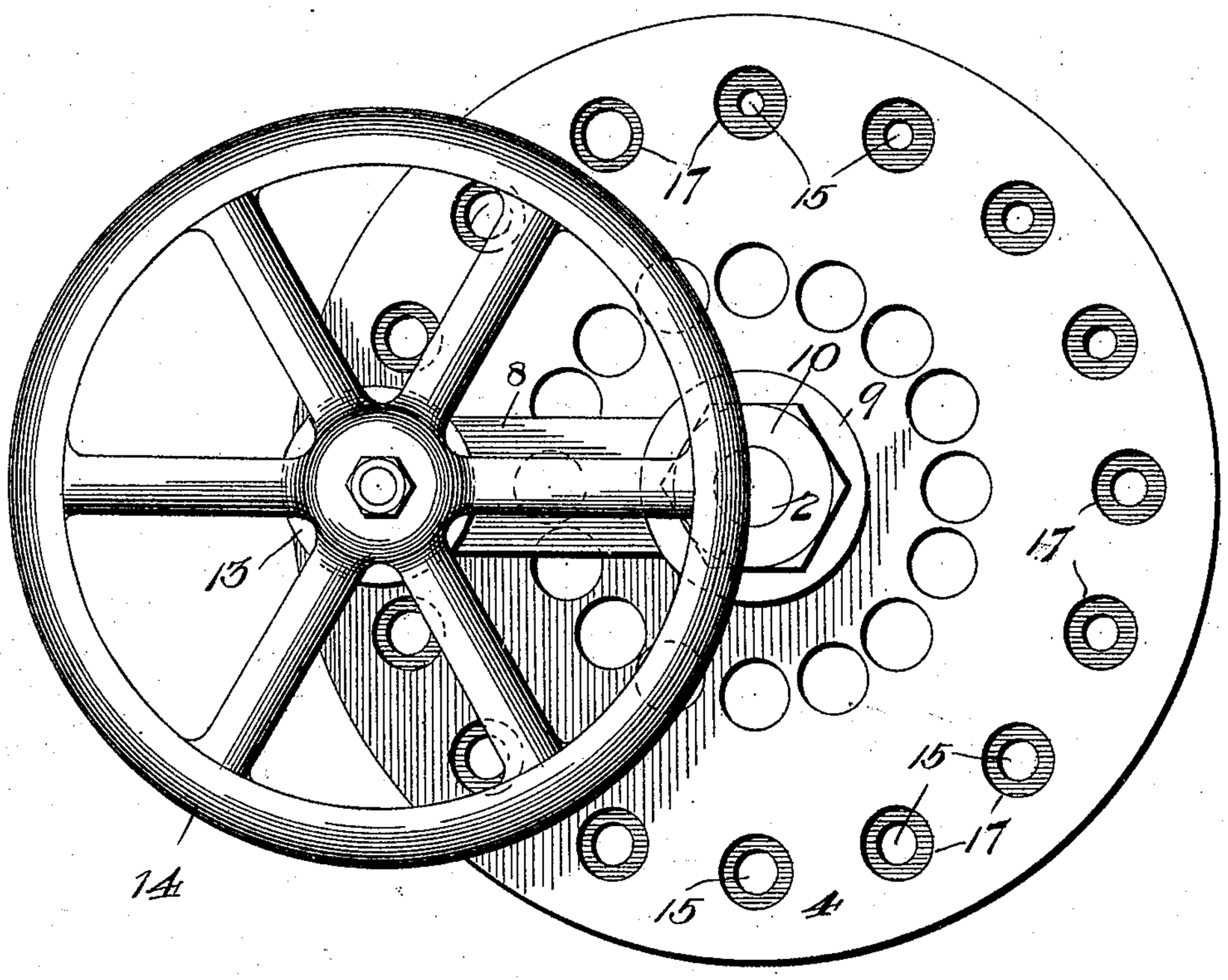
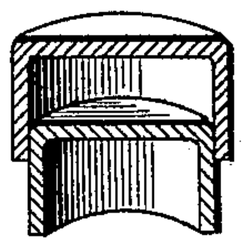


Fig. 3.



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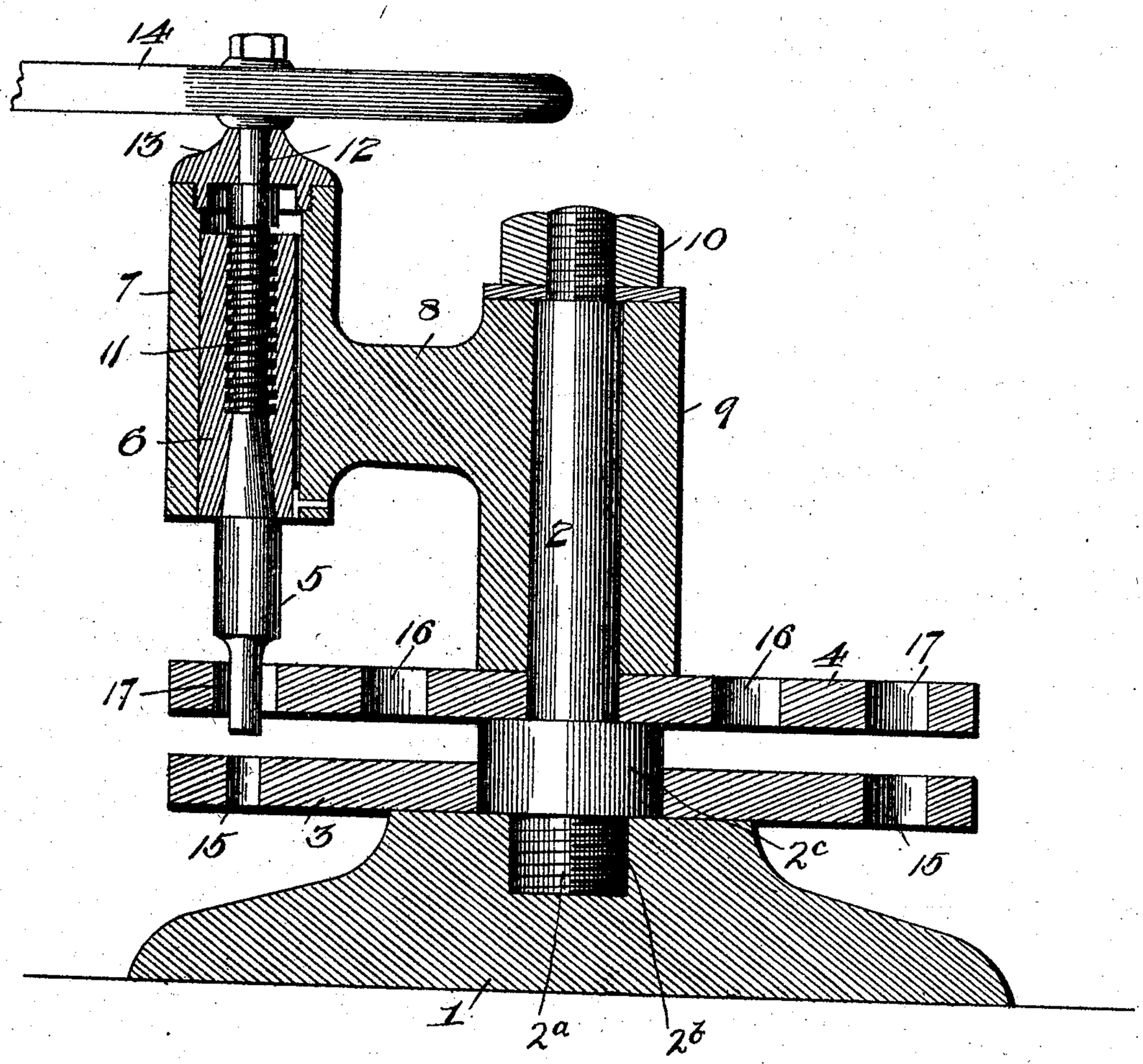
2 SHEETS—SHEET 2.

Fig. 2.



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UNITED STATES PATENT OFFICE.

JOHN L. KELLY, OF ST. PAUL, MINNESOTA.

DRAW-PRESS FOR SHEET METAL.

No. 805,967. Specification of Letters Patent. Patented Nov. 28, 1905.

Application filed March 24, 1904. Serial No. 199,759.

To all whom it may concern:

Be it known that I, JOHN L. KELLY, a citizen of the United States, residing at St. Paul, in the county of Ramsey and State of Minnesota, have invented certain new and useful Improvements in Draw-Presses for Sheet Metal, of which the following is a specification.

This invention relates to punching-machines of that type which are designed for shaping hollow and tubular metallic articles, and the invention has special reference to a machine of this character possessing special utility as a shaping-machine for seamless caps, crowns, and analogous articles employed in dental work.

To this end the invention primarily contemplates a punching-machine designed particularly for manufacturing with facility and accuracy telescopic caps or cups employed in the dental bridgework covered by my former patent, No. 709,410, dated September 6, 1902, while at the same time possessing general utility for making seamless articles of various kinds.

With these and many other objects in view, which will more readily appear as the nature of the invention is better understood, the same consists in the novel construction, combination, and arrangement of parts, which will be hereinafter more fully described, illustrated, and claimed.

The essential feature of the invention is the relative arrangement of dies and punches to provide for shaping seamless caps of different sizes designed to have a telescopic fit one within another.

In the accompanying drawings, Figure 1 is a top plan view of a punching-machine embodying the present invention. Fig. 2 is a vertical sectional view thereof. Fig. 3 is a detail in perspective of the dental bridgework, showing the form of telescopic caps which the machine is particularly designed to make.

Like numerals designate corresponding parts in the several figures of the drawings.

In carrying out the invention any suitable type of base or stand 1 is employed, and upon this base is mounted a central supporting-post 2. This post 2 has a threaded lower end 2^a screwed into a corresponding threaded socket 2^b in the base, whereby it is fixed to said base, and it also has a boss 2^c, disposed above the base 1. Arranged on the post 2 is a horizontal die bed or plate 3, and also arranged on the post is a horizontal plate 4, having a circular series of apertures 17 of a common diameter for guiding interchangeable reciprocating plunger-punches 5, of which but one is shown. The plate 4 is also shown as provided with an inner circular series of apertures 16. These apertures 16, however, have nothing to do with my invention, being merely provided to render the plate lighter.

The reciprocating plunger-punch 5 is of a size corresponding to the size of the cap, tube, or crown to be shaped and is designed to have any suitable detachable connection with the sliding punch-head 6, working in the upright bearing-box 7, formed at the outer end of the horizontally-swinging carrier-arm 8, which is formed at the end opposite the bearing-box 7 with an upright cylindrical bearing-sleeve 9, turning upon the post 2 and held thereon by a fastening-nut or equivalent device 10. The sliding punch-head 6 is threaded to accommodate the threaded feed-spindle 11, having a stem portion 12 projecting through the cap 13 at the top of the box, and to the upper end of which is fastened the hand-wheel 14.

The lower horizontal die bed or plate 3 is of circular form and provided at or near the periphery thereof with a continuous series of sizing-holes 15 of regularly-diminished size. Each of these holes 15 is larger than the next smaller opening in the proportion of the thickness of the material of which caps are to be formed, so that a cap finally shaped in one of such openings will have an accurate registering or telescopic fit within a cap finally shaped in the next larger opening. The openings 17 in plate 4 correspond in size to the shank of the punch 5 and are designed to receive and steady the punch as the same descends upon the blank and into one of the sizing-holes 15 of plate 3.

In operation the blank disk from which the cap is to be made is placed on the die-bed 3 over one of the holes therein. The punch is then operated downward to carry the disk through such hole to give the same its first shaping, which will be of a saucer form. The blank in this shape is then placed over the next smaller sizing-hole 15, and a punch smaller than that first mentioned is placed in the head 6 and moved down upon the work and through said hole, thereby giving it the final shape. The same treatment is carried out in connection with the cap which is to telescope with the one just made, except that the final treatment is necessarily given in a different-sized sizing-hole 15. The arm 8 may be freely swung around over the guide-plate 4 to per-

mit of the operation described, and it will also be obvious that any analogous articles, such as a dental crown, can be shaped through the medium of the instrumentalities described.

Various changes in the form, proportion, and minor details of construction may be resorted to without departing from the spirit of the invention or sacrificing any of the advantages thereof.

It is desired to call attention, however, to the circumference of the punches and holes, the construction of which makes it possible to produce sixteen tubes or caps adapted to telescope one within the other in regular sequence from the smallest to the largest.

It will be gathered from the foregoing that a separate punch must be used for each size of hole in the die-plate 3; but all of the punches have shanks of the same diameter to fit the holes in the guide-plate 4, which are all of uniform diameter.

Having thus described the invention, what is claimed as new, and desired to be secured by Letters Patent, is—

1. In a machine of the class described, the combination of a punch, and a die-plate formed with holes uniformly varying in diameter; the difference in size between each hole and the next larger hole corresponding to the thickness of the metal to be punched, whereby accurate telescoping of the tubes formed is assured.

2. In a machine of the class described, the combination of a punch, and a die-plate having a series of holes gradually increased in size in regular sequence; the difference in size between each hole and the next larger hole corresponding to the thickness of the metal to be punched, whereby accurate telescoping of the series of tubes formed in the series of holes is assured.

3. In a machine of the class described, the combination of a die-plate having a circular series of holes, a post disposed in the center of said circular series of holes, a horizontally-swinging arm mounted on said central post and having an upright bearing-box disposed above the series of holes in the die-plate, a threaded punch-head movable vertically in said bearing-box, a punch carried by said head, a feed-screw engaging the punch-head and having a stem extending through the upper end of the bearing-box, and a hand device mounted on said stem and disposed above the bearing-box.

4. In a machine of the class described, the combination of a die-plate having a circular series of holes, a post disposed in the center of said circular series of holes, a horizontally-swinging arm mounted on said central post and having an upright bearing-box disposed above the series of holes in the die-plate, a threaded punch-head movable vertically in said bearing-box, a punch carried by said head, a feed-screw engaging the punch-head and having a stem extending through the upper end of the bearing-box, a hand device mounted on said stem and disposed above the bearing-box, and a guide-plate disposed above the die-plate and having one or more holes alined with a hole or holes of said die-plate.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN L. KELLY.

Witnesses:
F. T. McNAMARA,
T. PETERSON.