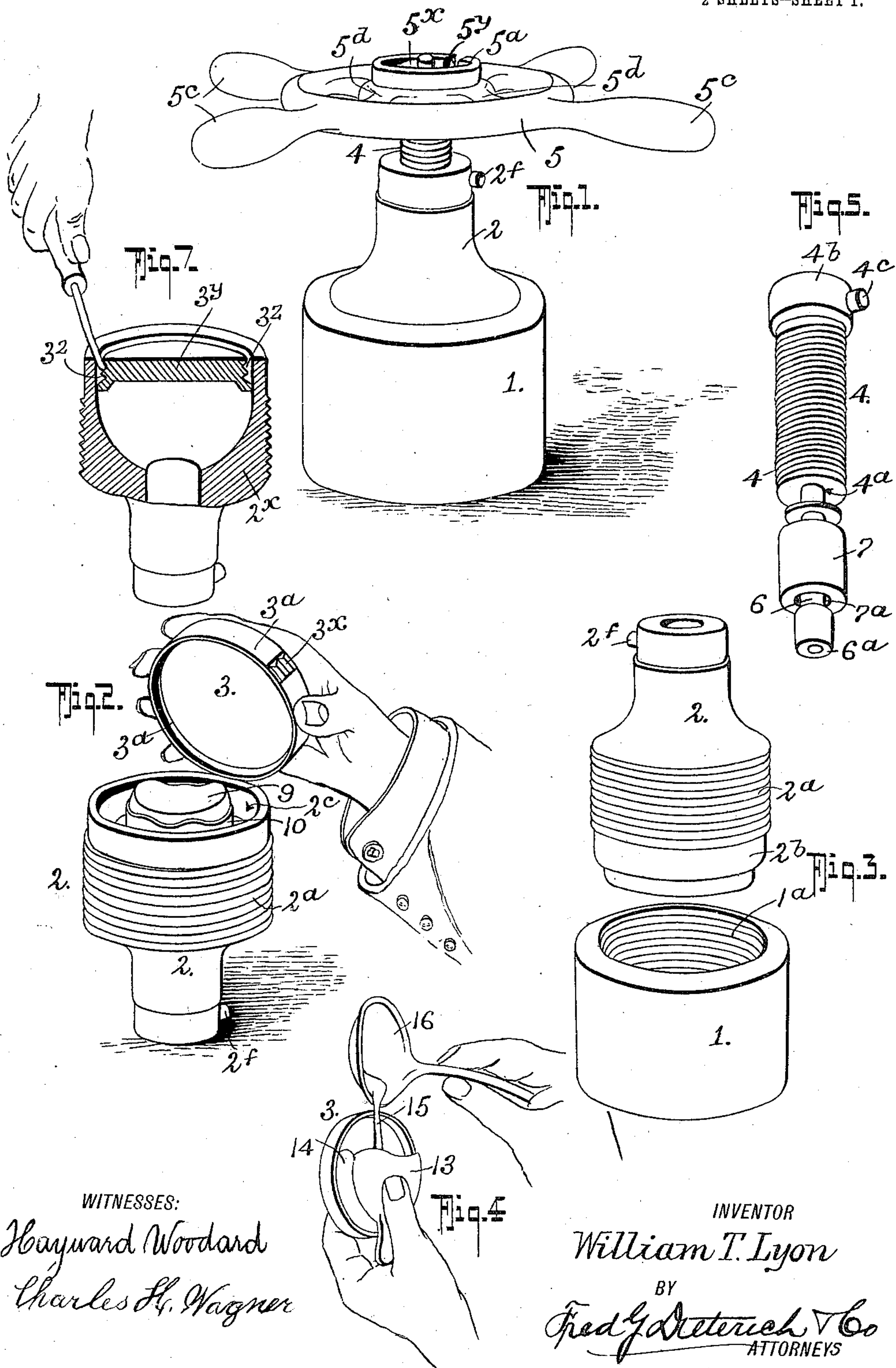


W. T. LYON.  
DENTAL PLATE SWAGER.  
APPLICATION FILED AUG. 8, 1910.

995,616.

Patented June 20, 1911.

2 SHEETS—SHEET 1.



WITNESSES:  
Hayward Woodard  
Charles H. Wagner

INVENTOR  
William T. Lyon  
BY  
Fred G. Stetson & Co.  
ATTORNEYS

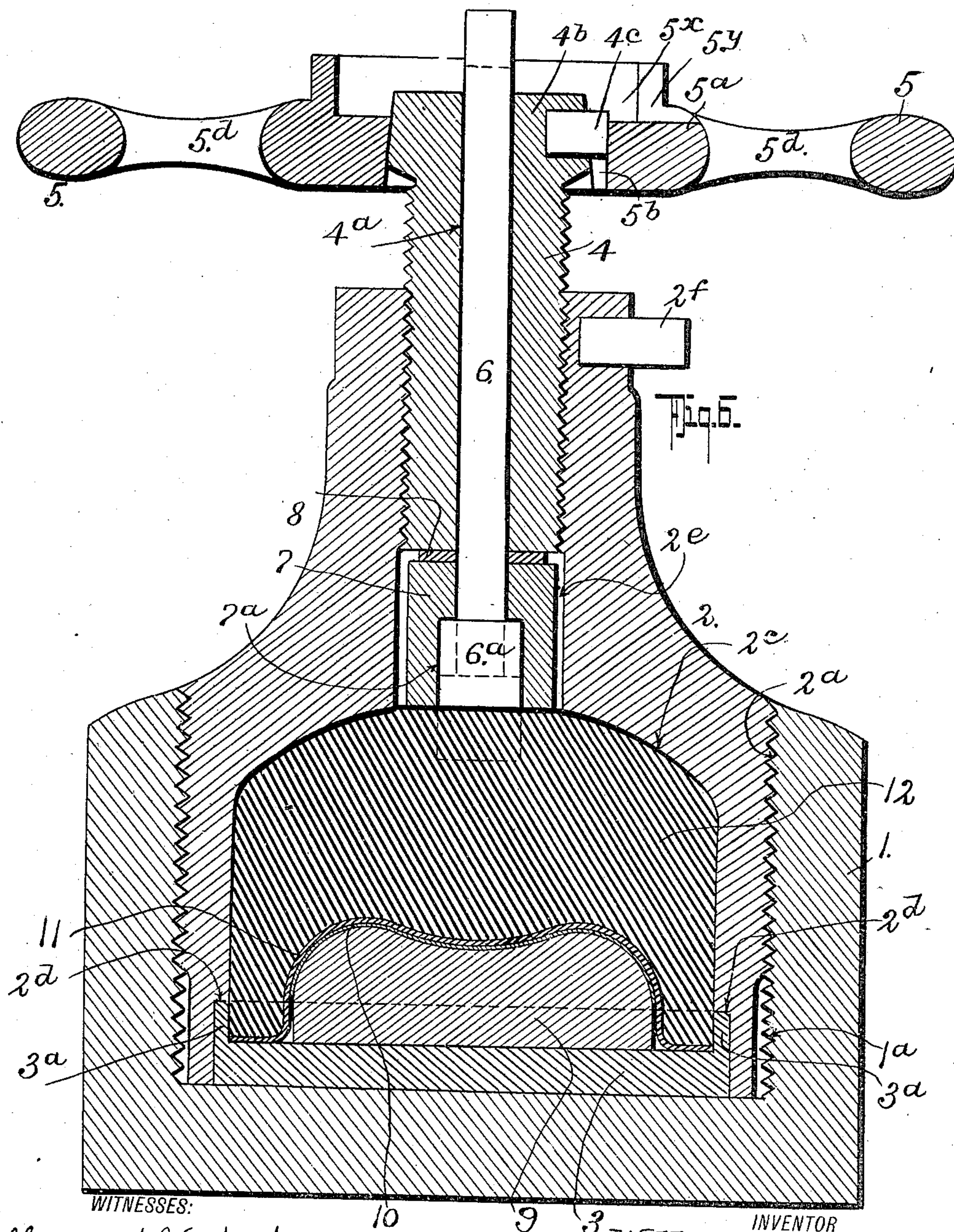


W. T. LYON.  
DENTAL PLATE SWAGER.  
APPLICATION FILED AUG. 8, 1910.

995,616.

Patented June 20, 1911.

2 SHEETS—SHEET 2.



WITNESSES:  
Hayward Woodard  
Charles H. Wagner.

INVENTOR  
William T. Lyon

BY  
Fred G. Osterich & Co.  
ATTORNEYS



# UNITED STATES PATENT OFFICE.

WILLIAM THOS. LYON, OF PORTLAND, OREGON.

## DENTAL PLATE-SWAGER.

995,616.

Specification of Letters Patent. Patented June 20, 1911.

Application filed August 8, 1910. Serial No. 576,024.

*To all whom it may concern:*

Be it known that I, WILLIAM T. LYON, residing in Portland, in the county of Multnomah and State of Oregon, have invented certain new and useful Improvements in Dental Plate-Swagers, of which the following is a specification.

My invention is an improved dental plate swager for use in making plates for false teeth and the like, and the invention resides in providing a swager wherein a base cup is provided with a screw threaded die cup that is chambered to form the die chamber of the apparatus, and which is provided with an upwardly extended tubular shank having an externally threaded bore in which the compression plunger is threaded, the plunger being of a particular construction whereby the plastic substance that forms the plate to be swaged into shape, may be applied by screw pressure and also by driving or hammering, and to this end the screw plunger carries an auxiliary impacting plunger on which the blows of a hammer may be delivered to effect the final compression of the plastic substance within the die chamber.

In its more subordinate nature the invention also comprises those novel details of construction, combination and arrangement of parts, all of which will be first fully described, then be specifically pointed out in the appended claims and illustrated in the accompanying drawings, in which:

Figure 1, is a perspective view of my invention complete. Fig. 2, is a perspective view showing the casting block about to be placed in position upon the die and plate in the die chamber. Fig. 3, is a detail perspective view showing the casing block in place and the die cup about to be placed in position and screwed down into the base cup. Fig. 4, is a detail perspective view showing the manner of casting the die. Fig. 5, is a detail perspective view of the plunger. Fig. 6, is an enlarged central vertical longitudinal section of the device. Fig. 7, is a detail sectional perspective of a modification.

Referring now to the accompanying drawings in which like letters and numerals of reference indicate like parts in all of the figures 1 designates the base cup which is bored from the top and internally threaded as at 1<sup>a</sup>. Within the cup 1 the die cup 2 is threaded, the die cup 2 being provided with

the externally threaded portion 2<sup>a</sup> terminating in the lower smooth rim 2<sup>b</sup> and provided with the internal die chamber 2<sup>c</sup> which may be counterbored to form a shoulder 2<sup>d</sup> to receive the casting block 3. The casting block 3 is of a diameter to snugly fit within the mouth of the die cup 2 and has an annular flange 3<sup>a</sup> to fit the counterbored portion 2<sup>e</sup> of such die cup. The die cup 2 has its barrel bored and tapped as at 2<sup>e</sup> to receive the screw plunger 4. The screw plunger 4 has a central bore 4<sup>a</sup> in which the pin 6 that carries the auxiliary tapping or impacting plunger 6<sup>a</sup>, is held. The screw 4 has a head 4<sup>b</sup> on which the hub portion 5<sup>a</sup> of the turning wheel 5 is fitted, the hub 5<sup>a</sup> being slotted as at 5<sup>b</sup> to receive the radial pin 4<sup>c</sup> of the screw 4 so that the screw and the wheel may turn together. The wheel 5 has the hub portion 5<sup>a</sup> that is united with the rim 5 by spokes 5<sup>d</sup> and it may be provided with arms 5<sup>e</sup>, as shown in Fig. 1, if desired. On the pin 6 is the die head 7 which swivels on the pin 6 and is separated from the screw 4 by a washer 8 to prevent sticking or mashing of the head 7. It will be noted that the head 7 is counterbored at 7<sup>a</sup> to receive the auxiliary plunger 6<sup>a</sup>. The die cup 2 is provided with a radial pin 2<sup>f</sup> which may take a spanner wrench so that the cup 2 may be screwed into the cup 1.

9 represents the cast over which the metal 10 to form the plate is fitted, an apron 11 if desired, being placed over the cast or die and the plate to separate the same from the plastic substance 12 which is forced into the chamber 2<sup>c</sup> of the die cup to cause the plate 10 to conform closely to the configuration of the die cast 9.

In operation the impression of the mouth is taken in the usual way with plaster of Paris. Any excess of plaster of Paris is then trimmed off and the impression is then ready for casting. The impression is next laid upon the casting block 3 (see Fig. 4) filled around the outer edge with mouldine or plaster 14 to prevent the escape of molten metal, after which the metal 15 is poured from the ladle 16 into the impression 13, as shown in Fig. 4, and the die is then cast. The metal used in casting is especially prepared for this device and is of a very low fusing point. The metal is fused at as low a temperature as possible in order to prevent volatilization of the more volatile sub-



stances which they contain (usually bismuth and the like.) The metal is then poured into the space between the impression 13 and the block 3, as heretofore described and indicated in Fig. 4 of the drawings, until the space is entirely filled. In order to get the best results it is advisable to warm the casting block 3 under a slow flame before casting as this will prevent the metal when poured from chilling too quickly and will bring out the fine lines of the mouth. The next step in the use of my invention is to conform the metal 10 to be used for the plate to the general form of the die and this may be done by simply forcing the plate down into the concavity of the die 9 and turning it over the sides with the fingers and thumbs, or a mallet may be used, if desired, as readily understood by those skilled in the art. The die camber 2 is then inverted, as shown in Fig. 2, and partially filled with vulcanite 12 or other suitable plastic substance, and the die 9 and plate 10 are laid face downward upon it, as shown in Fig. 2, it being understood that the apron 11 may be interposed between the plate 10 and the plastic 12, as before intimated, if desired. The casting block 3 is then placed in the cup 2 and forced down until it sticks in place, after which the cup 2 is inverted, as shown in Fig. 3, and then screwed into the base cup 1 as far as it will go until the mouth of the cup 2 rests solid on the bottom of the cup 1, see Fig. 6. Screwing the cup 2 down into the cup 1 forces the casting block 3 up into the bottom of the die chamber and causes any surplus rubber to flow up into the bore 2<sup>e</sup> of the cup 2. If it is found necessary to add more rubber or other plastic 12 in order to do the swaging properly, small pieces may be dropped into the hole 2<sup>e</sup> at the top care being taken not to fill the cup 2 with plastic so that it will not run into the threads of the bore 2<sup>e</sup>. The plunger 4 with its pin 6 and other parts (see Fig. 5) is next inserted into the hole 2<sup>e</sup> and screwed down, but not with sufficient force to swage the plate completely. The machine is then opened and the plate is taken out and examined and trimmed to suit the die. Any wrinkles or buckles that appear in the plate may be malleted out and the plate made to conform as closely as possible to the die. The plate and die are then replaced in the machine and the cup 2 again screwed down into the cup 1. The plunger 4 is then tightly screwed down. A few moderate blows of a hammer upon the pin 6 will complete the swaging operation. I find that in practice this impacting of the plastic 12, through the medium of the pin 6 and auxiliary plunger 5<sup>a</sup> is of considerable importance as the concussion of the hammer blows under the tremendous pressure applied, through the medium of the screw 4, not only drives the

plate to every part of the die, but also takes the spring from the metal causing it to lie very close to the die.

If aluminium is to be used for the plate it should be first annealed by holding the same over a flame until it is hot enough to char the point of a soft pine stick. Care should be taken not to allow it to get too hot or crystallization will take place and the plate will be spoiled. We find that annealing of any metal used for the plate facilitates the swaging and may be resorted to as conditions as desired. After the plate has been swaged, as described, it is removed from the machine and the work of adaptation or fitting takes place in the usual manner and as this operation on the plate has nothing to do further with the operation of my swaging machine a further description thereof is unnecessary. Instead of counterboring the cup 2 and 2<sup>a</sup> the same may be left smooth and the block 3<sup>v</sup> provided with annular groove 3<sup>v</sup> to leave a space between the block and the cup so that a screw driver or other suitable tool may be inserted by means of which the block 3<sup>v</sup> may be pried out of the cup, as indicated in Fig. 7, of the drawings, or the block 3 (see Fig. 2) may have a portion cut out into stepped form, as at 3<sup>x</sup> in Fig. 2, so that a screw driver or similar implement may be inserted to pry out the block 3 from the cup 2 when desired. Instead of using a spanner wrench to screw the block 2 in place the handle 5 may be further counterbored from one face as at 5<sup>x</sup> and radially slotted as at 5 so that by removing the handle from the screw bore (see Figs. 1 and 6) and turning it over it may be placed on the cup 2 to fit over the pin 2<sup>f</sup> and used as a means for screwing the cup 2 in place.

What I claim is:

1. In a dental plate swager, a die cup having a die chamber and a shank having a threaded bore leading into said die chamber, a screw plunger threaded into said threaded bore, an auxiliary plunger having a shank projected through and reciprocable in said screw plunger, a casting block fitted into said die cup to form a closure for said die chamber, and means for holding said casting block in said die cup.

2. In a dental plate swager, a base cup, a die cup threaded into said base cup and having a die chamber and a shank having a threaded bore leading into said die chamber, a screw plunger threaded into said threaded bore, an auxiliary plunger having a shank projected through and reciprocable in said screw plunger, and a casting block fitted into said die cup to form a closure for said die chamber.

3. In a dental plate swager, a base cup, a die cup threaded into and forming a closure for said base cup, said die cup having an internal die chamber and having a shank pro-



vided with a threaded bore leading into said die chamber, and a combined screw and impacting plunger device held in said threaded bore of said die cup shank.

5 4. In a dental plate swager, a base cup, a die cup threaded into and forming a closure for said base cup, said die cup having an internal die chamber and having a shank provided with a threaded bore leading into  
10 said die chamber, a combined screw and impacting plunger device held in said threaded bore of said die cup shank, said die cup having an open end and a casting block fitted into said open end to form a closure  
15 therefor.

5. In a plate swager, a base cup having an open ended internally threaded chamber, a die cup having an open end and threaded into said base cup to form a closure therefor,  
20 said die cup inclosing a die chamber, a casting block carried by said die cup, said die cup having a shank provided with an internally threaded bore, a screw threaded into said bore and having a longitudinal passage,  
25 a rod movable in said longitudinal passage, an auxiliary plunger head carried by said rod and projectable into said die chamber, a die head swiveled onto said rod against which said screw is adapted to apply force.

30 6. In a plate swager, a base cup having an open ended internally threaded chamber, a die cup having an open end and threaded into said base cup to form a closure therefor, said die cup inclosing a die chamber, a cast-

ing block carried by said die cup, said die 35 cup having a shank provided with an internally threaded bore, a screw threaded into said bore and having a longitudinal passage, a rod movable in said longitudinal passage, an auxiliary plunger head carried by said 40 rod and projectable into said die chamber, a die head swiveled onto said rod against which said screw is adapted to apply force, said die head being chambered to receive said auxiliary plunger head. 45

7. In a plate swager, a base cup having an open ended internally threaded chamber, a die cup having an open end and threaded into said base cup to form a closure therefor, said die cup inclosing a die chamber, a cast- 50 ing block carried by said die cup, said die cup having a shank provided with an internally threaded bore, a screw threaded into said bore and having a longitudinal pas- 55 sage, a rod movable in said longitudinal passage, an auxiliary plunger head carried by said rod and projectable into said die chamber, a die head swiveled onto said rod against which said screw is adapted to apply force, said die head being chambered to re- 60 ceive said auxiliary plunger head, and a washer interposed between said screw and said die head on said rod.

WILLIAM THOS. LYON.

Witnesses:

A. T. LEWIS,

ARTHUR H. LEWIS.