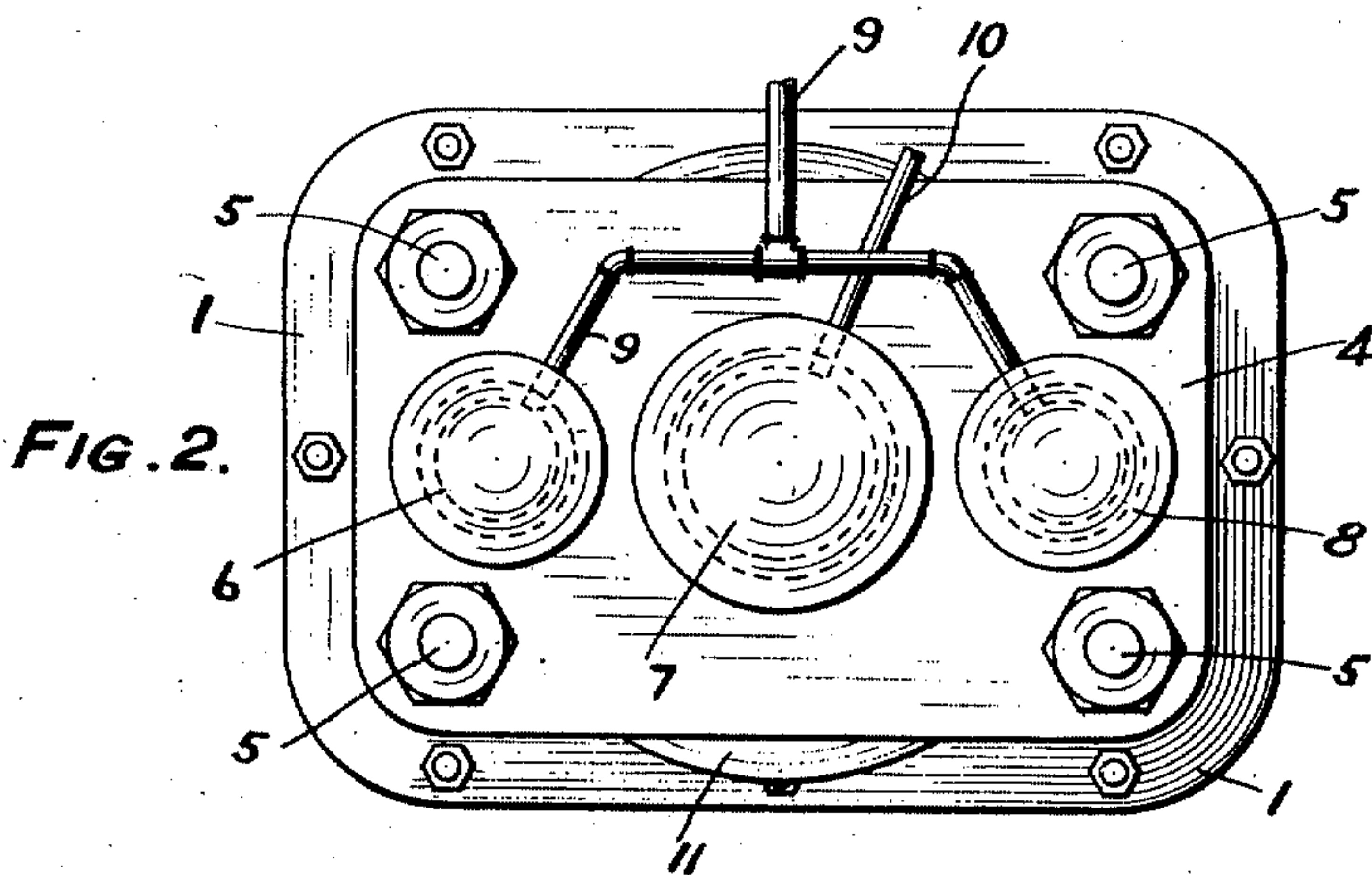
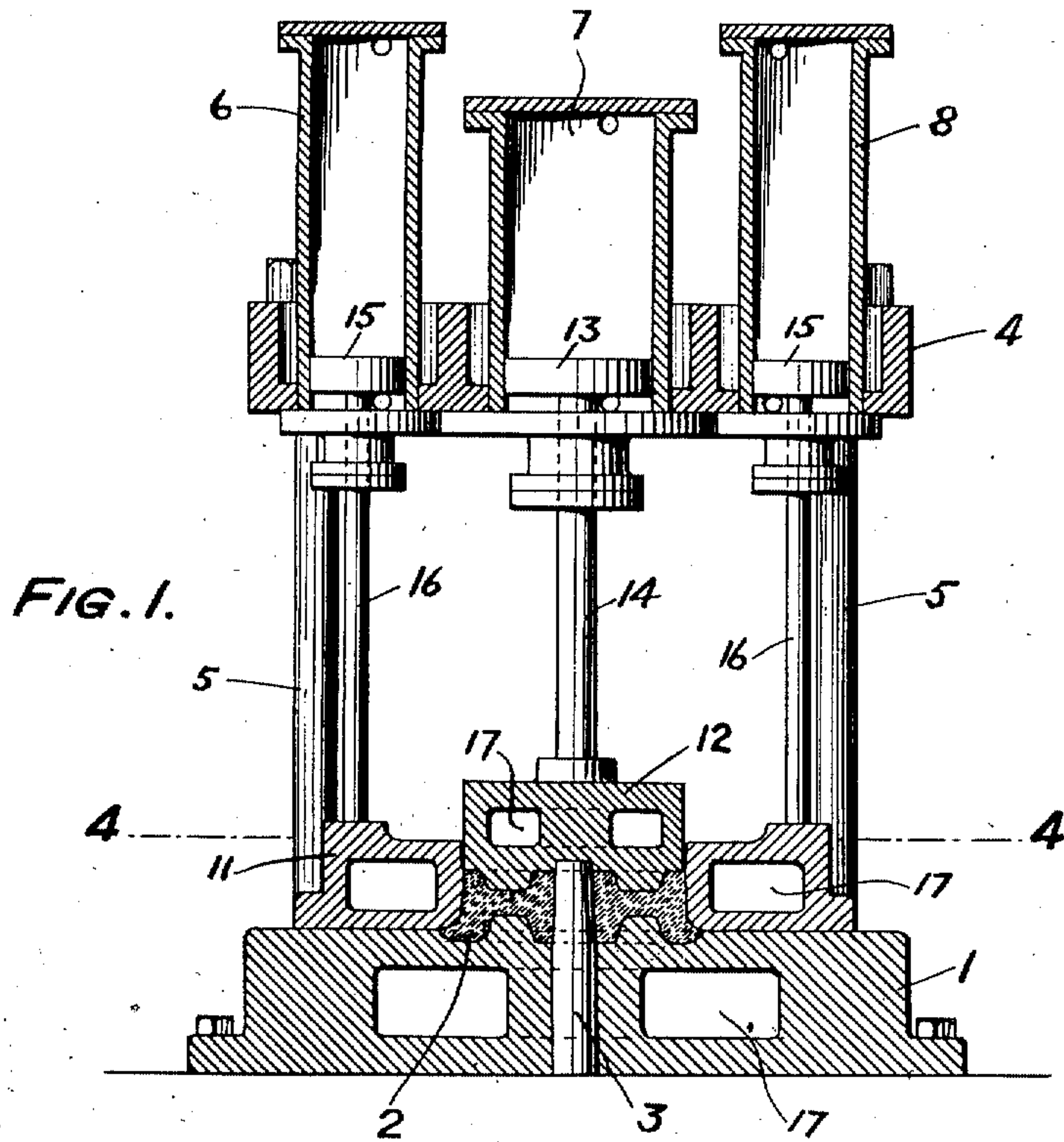


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METHOD OF AND APPARATUS FOR MAKING METAL ARTICLES.
APPLICATION FILED JULY 22, 1909.

985,753.

Patented Feb. 28, 1911.

2 SHEETS—SHEET 1.



WITNESSES:

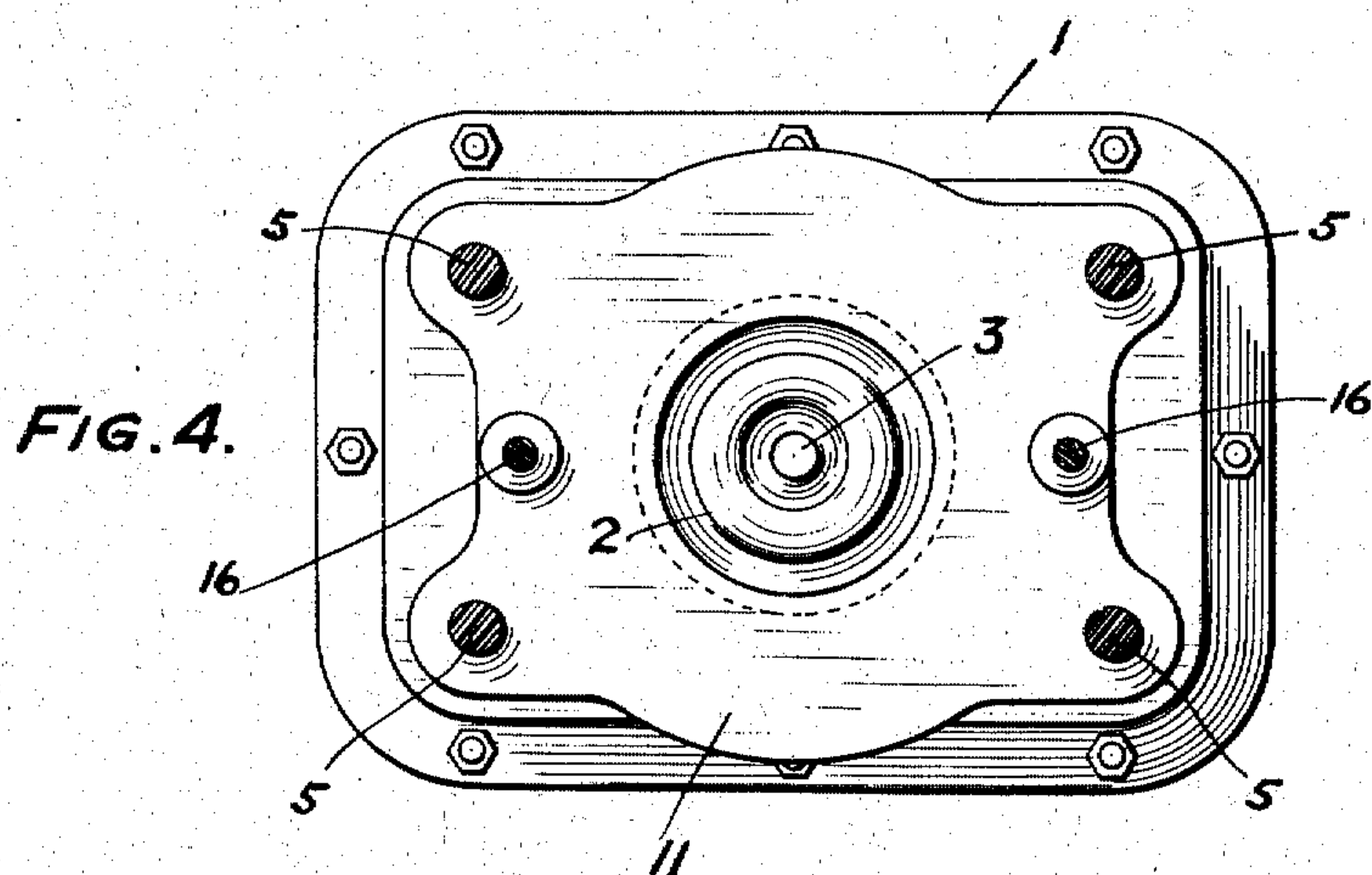
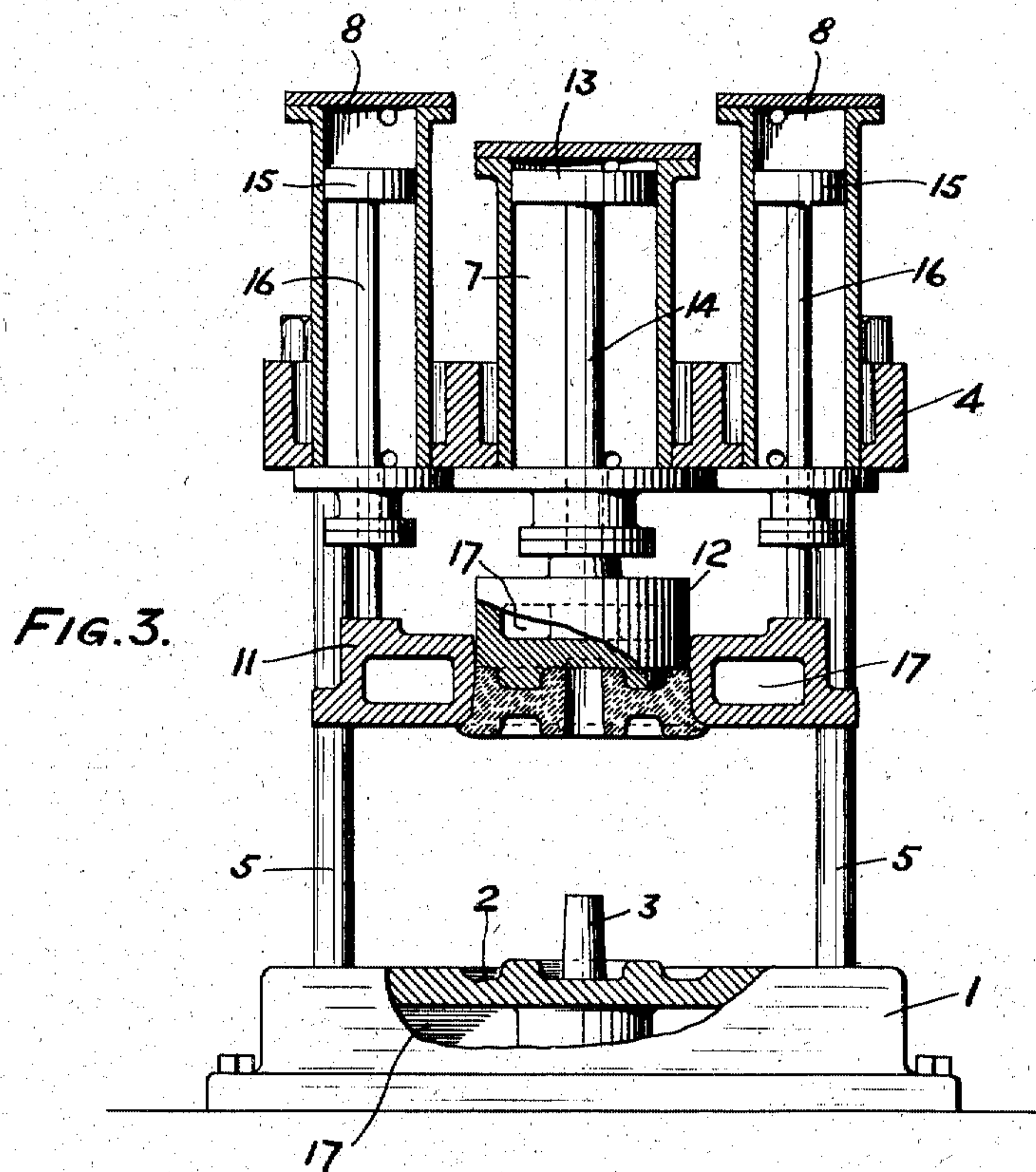
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2 SHEETS—SHEET 2.



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CHARLES A. WEEKS, OF PHILADELPHIA, PENNSYLVANIA.

METHOD OF AND APPARATUS FOR MAKING METAL ARTICLES.

985,753.

Specification of Letters Patent.

Patented Feb. 28, 1911.

Application filed July 22, 1909. Serial No. 508,969.

To all whom it may concern:

Be it known that I, CHARLES A. WEEKS, a citizen of the United States, residing at the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a certain new and useful Method of and Apparatus for Making Metal Articles, of which the following is a specification.

10 The principal object of the present invention is to provide for rapidly and economically making by a single operation articles of pre-determined form from fluid metal, as steel, which articles shall be free from dele-
15 terious strains and stresses and shall be of perfect form and homogeneous throughout.

The invention will be claimed at the end hereof but will first be described in connection with the accompanying drawings in
20 which—

Figure 1, is a side view, partly in section, illustrating apparatus embodying features of the invention and capable of use in the practice of the process of the invention.
25 Fig. 2, is a top or plan view of the apparatus shown in Fig. 1. Fig. 3, is a view similar to Fig. 1, showing the parts in a different position, and Fig. 4, is a sectional view taken on the line 4—4, of Fig. 1.

30 The invention will be described in connection with the manufacture of articles in final or approximately final form direct by a single operation from melted steel, although the invention is not necessarily limited to that material but is applicable in
35 whole or in part to other melted metals.

In practicing the process of my invention the melted metal in fluid condition is subjected to pressure sufficient to shape it in
40 a metal mold or die corresponding in form to the final or approximately final form of the article and at the same time and while under pressure, heat is artificially extracted from it until it solidifies sufficiently to permit of its removal while still at a high temperature in final or approximately final
45 form from the mold, die or form.

Referring to the drawings there is illustrated apparatus for making car wheels in
50 accordance with the invention but the invention is not limited to the making of car wheels as it includes other objects, and car wheels are referred to for the sake of description.

1, is a base provided with a portion 2, of the mold or die and with a core 3, that projects up into the space within the mold or die.

4, is a head rigidly supported above the base by means of standards 5, shown to consist of bolts. Upon the head are mounted
60 three cylinders 6, 7 and 8, fitted with inlet and outlet connections. These cylinders may be of the hydraulic variety. One set of these connections is shown in Fig. 2, and
65 the other set may be just like it.

9, are connections for simultaneously working the pistons of the cylinders 6 and 8, and 10, is a connection for the cylinder 7. The mold or die is made up of a stripper
70 section 11, of ring form and of a plunger section 12. The plunger section 12, is connected with the piston 13, of the cylinder 7, by means of a piston rod 14, and the stripper section 11, is connected with the pistons
75 15, of the cylinders 6 and 8, by means of piston rods 16.

17, are channels for the reception of a cooling fluid, as water, which is a means for artificially extracting heat from the con-
80 tents of the mold or die, the parts 2, 11 and 12, of which are made of metal.

In practicing the process of the invention the mode of operation of the described apparatus is as follows: Sufficient fluid steel
85 for making the object, for example, the car wheel in final or approximately final form is introduced into the metal die or mold and subjected to pressure therein by means of the described pistons and cylinders and
90 connections. At the same time and while the fluid metal is under pressure heat is artificially extracted or removed from it by means of the cooling fluid or material in the chambers or channels 17. While the
95 metal is still hot and has somewhat solidified it is removed from the mold. For this purpose the cylinders and their connections are used for lifting the parts 11 and 12, as shown in Fig. 3, and these parts carry with
100 them a hot car wheel. The stripper section 11, is lifted somewhat higher than it is shown in Fig. 3, and in this way the hot car wheel is ejected from the mold and can be caught in any convenient way. If desired
105 a little space can be left between the rim of the plunger 12, and the inner rim of the stripper section 11, for the passage of gases

and of any superfluous metal which latter would constitute a fin on the product that can be readily detached. By casting the fluid steel into a metal mold under pressure
5 and extracting artificially heat from it and removing the product while hot and as soon as sufficiently solidified, the product is free from deleterious strains and stresses and is in final or approximately final form as the
10 result of this quick operation. The product while hot may, if necessary, be finished and it is obviously cheap so far as its cost of production is concerned.

What I claim is:

15 1. The method of making articles in final or approximately final form from melted steel which consists in subjecting melted steel to sufficient pressure to shape it in a metal mold corresponding to the final or ap-
20 proximately final form of the article and simultaneously and while the melted metal is under pressure artificially extracting heat

from it, and removing the product as soon as its upper portions are sufficiently solidified to hold the shape and while hot from 25 the mold, substantially as described.

2. Apparatus for making articles in final or approximately final form from melted iron or steel which comprises the combination of a sectional metal mold or die of 30 which one part constitutes a plunger section and another a stripper section, means for artificially extracting heat from the mold which comprise passages or channels for the reception of a cooling fluid, and pistons 35 and cylinders appertaining respectively to the plunger section and the stripper section of the mold, substantially as described.

In testimony whereof I have hereunto signed my name.

CHARLES A. WEEKS.

Witnesses:

S. E. PATTERSON,
FRANK E. FRENCH.