

R. GÖSSER.
CASTING APPARATUS.
APPLICATION FILED FEB. 8, 1911.

1,047,513.

Patented Dec. 17, 1912.

2 SHEETS—SHEET 1.

Fig. 1.

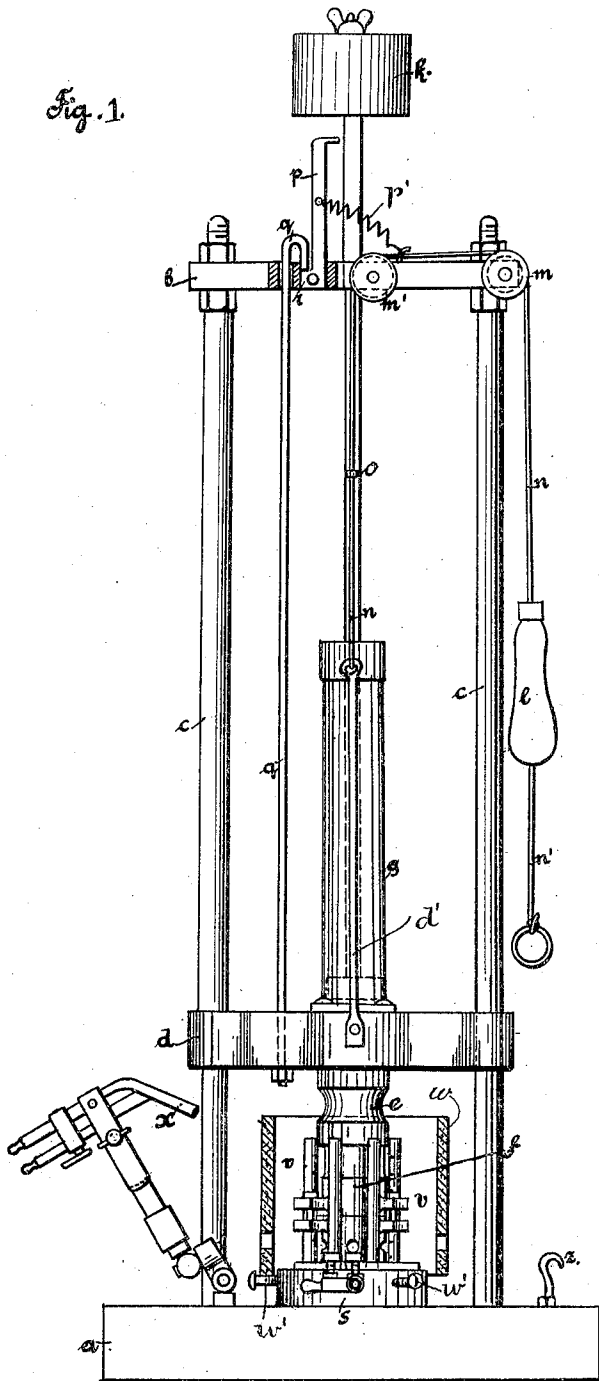
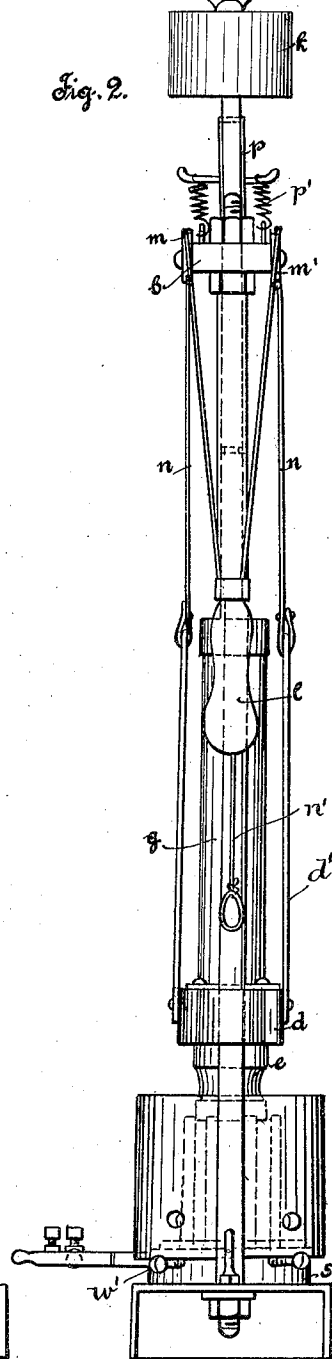


Fig. 2.



WITNESSES

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2 SHEETS—SHEET 2.

Fig. 3.

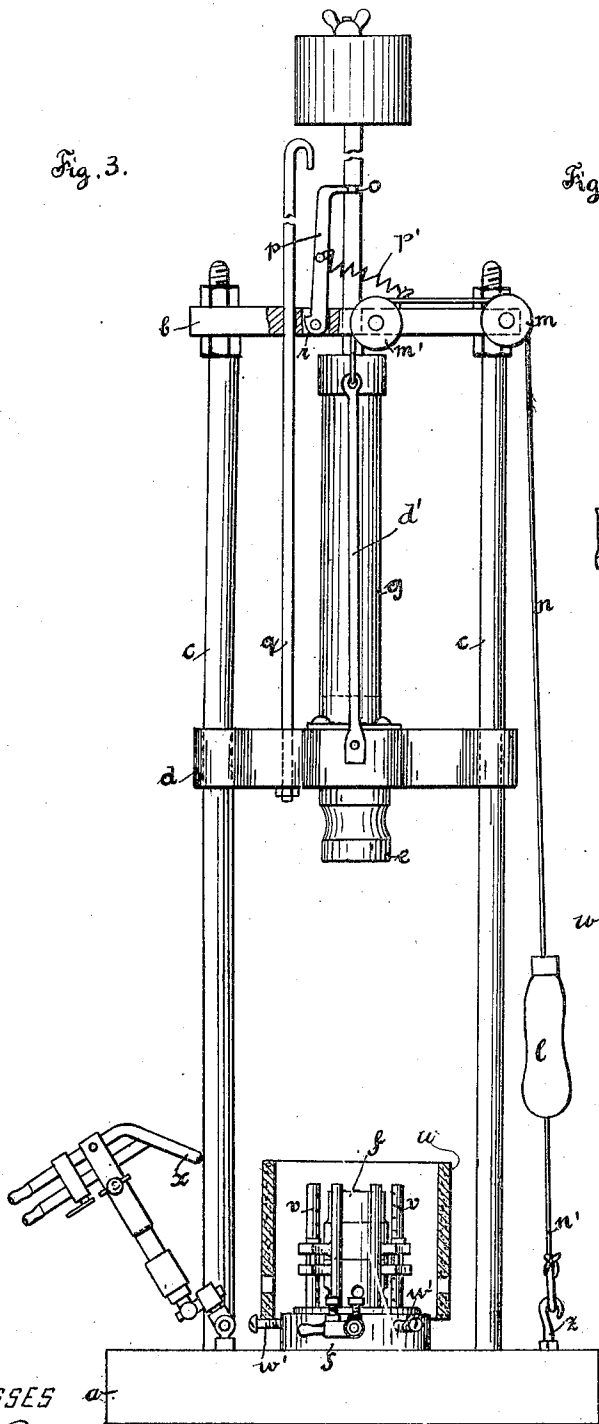


Fig. 4.

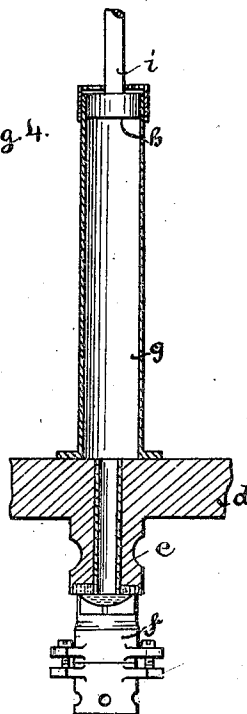
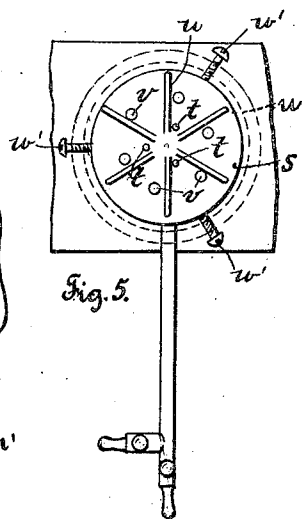


Fig. 5.



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CASTING APPARATUS.

1,047,513.

Specification of Letters Patent.

Patented Dec. 17, 1912.

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To all whom it may concern:

Be it known that I, ROBERT GÖSSER, a subject of the German Emperor, residing at Minden, i. W., Empire of Germany, have invented a new and useful Improvement in Casting Apparatus, of which the following is a specification.

My invention relates to apparatus, especially for use by dentists, for casting small articles of metal or other material, in which air is compressed and admitted under pressure into a heated mold, so as to force the molten metal therein into those portions of the mold which are shaped to form the finished casting.

One of the objects of my invention is the provision of an apparatus of this kind in which a compressing or pumping mechanism is movable away from the mold, but which is capable of readily being placed into close relationship and operative communication therewith when desired.

Another object of my invention is the provision of an automatic device for holding the piston of the pumping mechanism in the upper position of this part and for releasing said piston immediately before the cylinder has reached its lower position in which it is in communication with the mold.

Other objects will be pointed out or will otherwise appear in the following description of one embodiment of my invention in which—

Figure 1 is a front elevation of the apparatus with the pumping mechanism in its lower position, Fig. 2 is a side elevation thereof, Fig. 3 is a front elevation with the pumping mechanism in its upper position, Fig. 4 is a vertical section through a part of the apparatus and Fig. 5 is a plan view of the mold heating device.

In the apparatus illustrated, the reference character *a* indicates a bed plate upon which a frame is erected which consists of the vertical columns *c* and the transverse head *b*. The closure plate *d* slidably mounted on said columns carries the pump barrel or cylinder *g*, extending vertically above the plate, and the closure plunger *e* extending vertically below the plate, coaxial with and in communication with the pump cylinder. Suitably mounted within

the pump barrel is a piston *h* provided with a piston rod *i* which extends through the upper end of the barrel and carries upon its upper end weight *k* which may be secured to the rod *i* in any suitable manner.

Each side of the closure plate *d* is provided with an upwardly extending pull rod *d'* to the end of each of which is secured a cord *n*. Each of the cords *n* passes upwardly from the pull rod to which it is secured and passes over a pulley *m* above the pull rod and the pulley *m'* at the end of the frame head *b*. After passing over the pulleys *m'*, the cords extend downwardly at the side of the frame and meet in a common handle grip *l*. To the lower end of the handle *l*, a cord *n'* is fastened, which is provided at its lower end with a ring, the latter being adapted to engage with a hook *z* secured to the base plate *a* for retaining the pump mechanism, in an obvious manner, in its upper position.

The piston *h*, piston rod *i* and weight *k* together with the cross plate *d* may be raised to the upper position by a downwardly exerted pull on the handle *l* and the ring on the cord *n'* may be engaged with the hook *z* to hold the parts in this position. It will be readily understood that upon disengaging the ring from the hook, the pumping mechanism may be lowered to its lower position. A catch device consisting of a pawl *p*, pivoted to the frame member *b* and retractile springs *p'* each having one end secured to the pawl and the other end secured to the member *b*, the springs serving to force the upper end of the pawl toward the piston rod, to coöperate with a groove *o* therein, is provided for the purpose of holding the piston and its associated parts in the upper position. When the handle *l* is pulled downwardly, the closure plate *d*, closure *e* and pump barrel *g* move upwardly and carry with them the piston *h*, piston rod *i* and weight *k*, the pawl *p* brushing along the piston rod during this movement and springing into the groove *o* therein at the termination of the upward movement when the parts have reached the upper position. The closure plate, closure and pump barrel may now be lowered without affecting the position of the piston and its associated

parts. A rod *g*, fixed to the plate *d*, extends through and above the frame member *b* and is provided at its upper end with a hook portion the length of the rod *g* and the position of its hook portion being such that just before the plate *d* reaches its lower position in which the closure *e* is in contact with the mold so as effectively to close its upper end, the hook portion of the rod engages with the nose *r* of the pawl *p* and causes the pawl to move against the force of the springs *p'* out of engagement with the groove *o* of the piston rod. The piston *h* together with its associated parts is now free to fall.

Upon the bed plate *a* is mounted a gas burner *s* provided with three burner openings *t* and three ribs *u* upon which the mold *f* is adapted to rest. The burner is further provided with a plurality of burner pipes *v* extending vertically upward from the burner and positioned so as to surround and project flames upon the mold. The mold is thus heated from below by virtue of the burner openings *t* and from the sides by virtue of the burner pipes *v*. A burner *x* provided with gas and air inlets is mounted on the base plate *a* in such a manner as to be movable in any direction. It will be readily understood that this burner may be swung on its pivot so as to direct a flame on the upper portion of the mold. A jacket *w* supported on pins *w'* projecting from the periphery of the burner *s* surrounds the mold *f* for preventing the dissipation of heat therefrom.

When the mold *f*, which may be of any suitable kind has been prepared, it is placed upon the burner *s* within the pipes *v*, the pump mechanism being in the upper position, and is heated from all directions by the burners *s* and *x*. After this heating process has been continued until the metal within the mold has been melted, the cross plate *d* together with the barrel *g* and the closure *e*, is lowered in the manner hereinbefore described. Immediately before the closure becomes seated upon the mold, the catch pawl *p* releases the weighted piston, as described, and the piston falls and strongly compresses the air in the piston barrel. The compressed air is thus forced into the mold above the molten metal therein through the aperture in the closure *e* and the molten metal is driven forcibly into that part of the mold which is to contain the casting. It will be noted that during the descent of the plate *d* and barrel *g*, before the actuation of the catch pawl *p*, there is a relative movement between the barrel *g* and the piston *h* which results in the drawing of air into the barrel. This air is in a heated condition, and the plate *d* and barrel *g* are likewise heated, because situated above the heated mold and consequently in the path of escape of heated

air from the mold. Consequently, when the catch pawl *p* is actuated and the piston *h* descends, it forces air in a heated state into the mold, thus preventing the quick cooling and hardening of the metal and the consequent more or less defective casting which would result from the forcing of cold air into the mold. It will be further noted that after the plate *d* and barrel *g* have been released from their upper position, the further operations of the apparatus are entirely automatic and the apparatus requires no attention from the operator until it is desired to remove the finished casting from the mold.

I claim:

1. In a casting apparatus, the combination of a mold, a closure adapted to be seated upon said mold and provided with a passageway, a pump element adapted to be placed in communication with said mold through said passageway, a second pump element movable relatively to said first mentioned pump element, means for moving said pump elements to a position removed from said mold, means for holding said second pump element in its removed position while the first pump element is moving to a position in which it is in communication with said mold, and means for disengaging said holding means, substantially as and for the purpose described.

2. In a casting apparatus, the combination of a mold, means for heating said mold, a closure for said mold, having a passageway and movable toward and from said mold in the path of escape of heated air from said mold, a pump piston, a pump cylinder cooperating with said piston and in communication with said passageway, means for causing a relative movement of the cylinder and piston while the closure moves toward the mold, whereby heated air is drawn into the cylinder and means for causing a relative movement of the cylinder and piston when the closure has become seated on the mold, whereby the heated air previously drawn into the cylinder is forced into the mold, substantially as and for the purpose described.

3. In a casting apparatus, the combination of a mold, a movably mounted closure therefor, a pump barrel mounted on said closure, a piston in said barrel, means for holding the piston immovable while the closure is moving to seat upon the mold and means for disengaging said holding means immediately before the closure has become seated upon the mold, substantially as and for the purpose described.

4. In a casting apparatus, the combination of a mold, a vertically movable closure therefor, a pump barrel mounted on said closure, a weighted piston in said barrel, a catch device for holding the piston in its

upper position while the closure is moving
to its lower position in which it is seated
upon the mold and means for disengaging
said catch device immediately before the
5 closure has reached its lower position sub-
stantially as and for the purpose described.

In witness whereof I have hereunto set

my hand in the presence of two subscribing
witnesses.

ROBERT GÖSSER.

Witnesses:

MARTA L. THOMPSON,
T. L. BODIN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."