

No. 810,832.

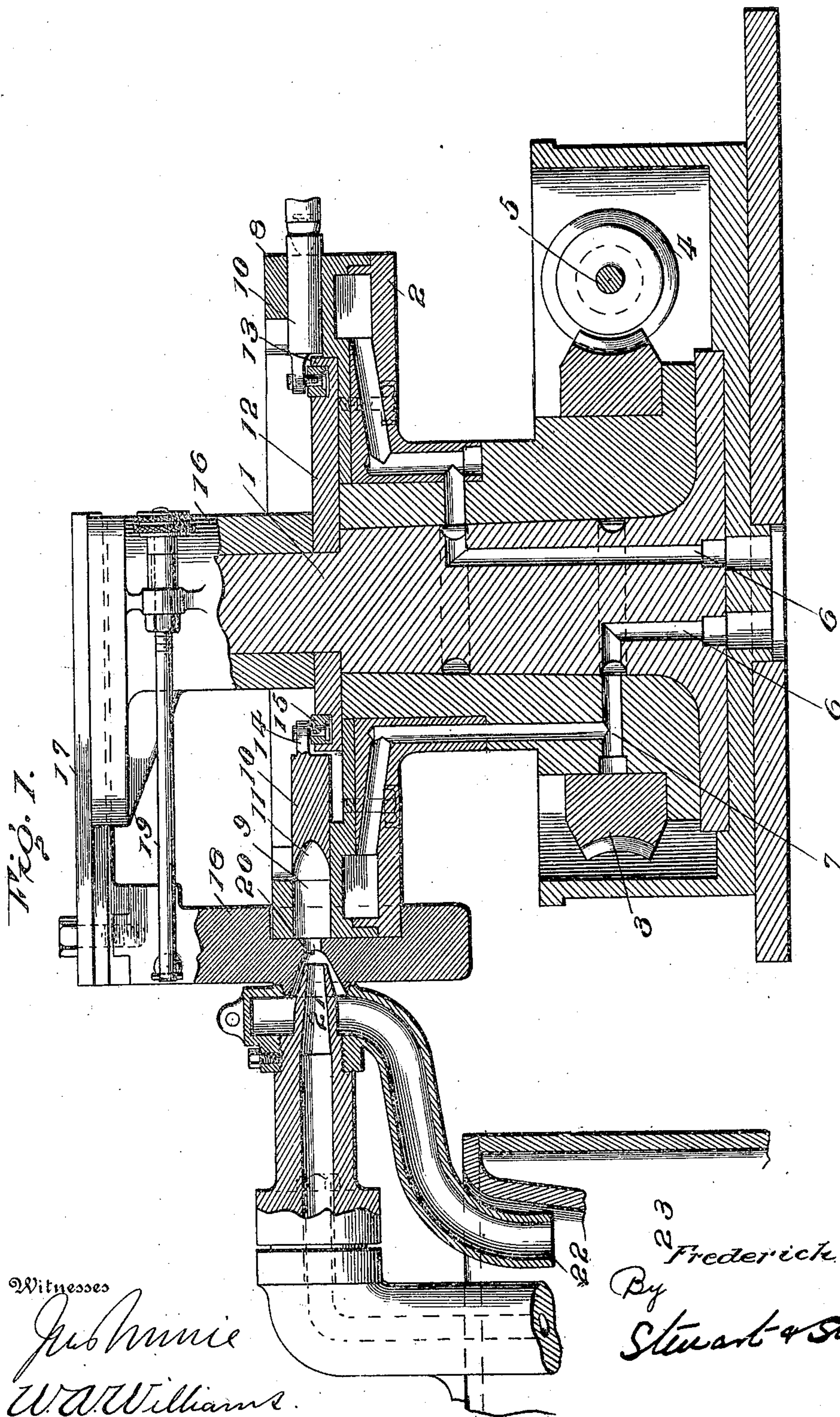
PATENTED JAN. 23, 1906.

F. WICKS.

APPARATUS FOR CASTING PROJECTILES FOR SMALL ARMS.

APPLICATION FILED MAR. 24, 1905.

4 SHEETS—SHEET 1.



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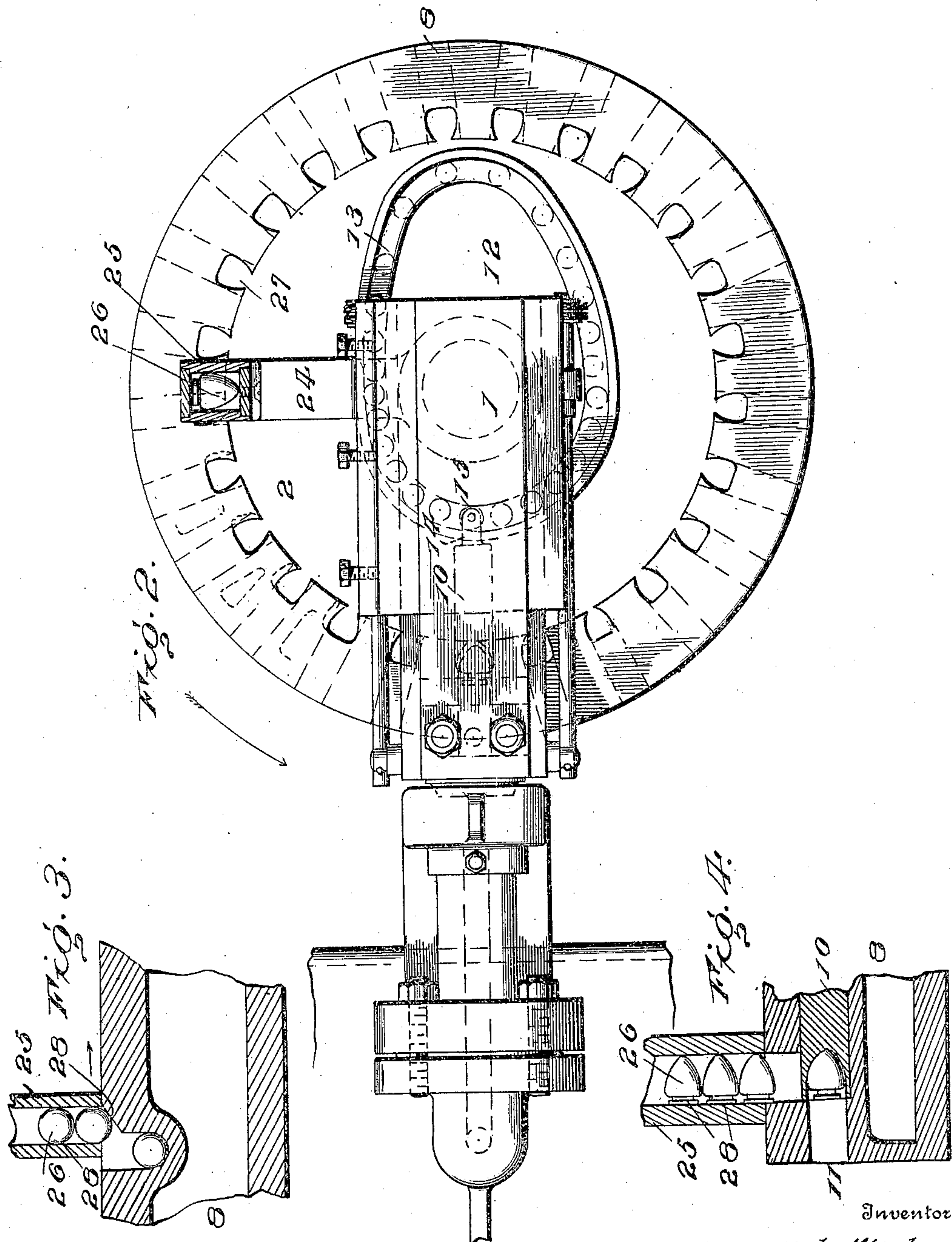
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4 SHEETS—SHEET 2.



Witnesses

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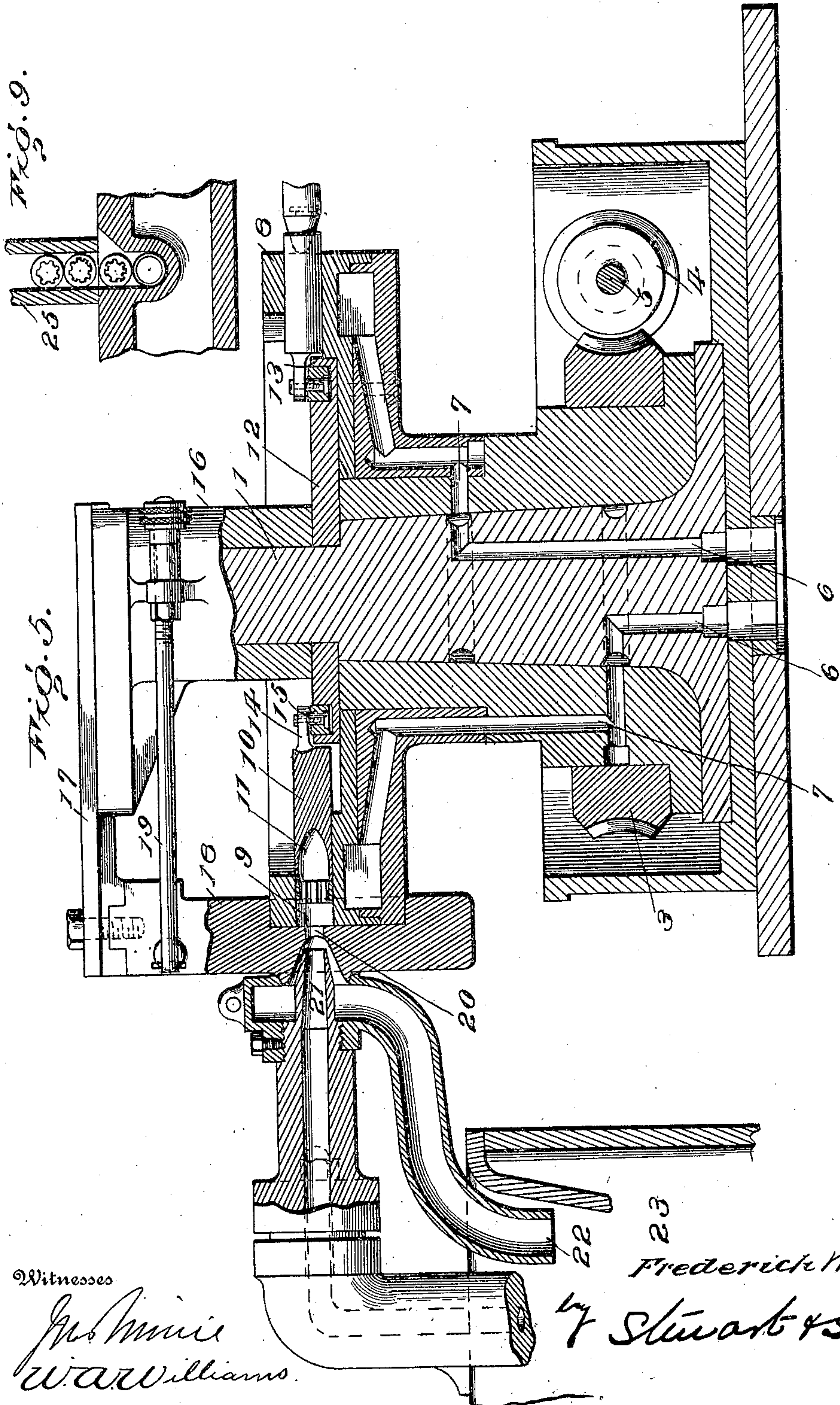
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4 SHEETS-SHEET 3



Witnesses

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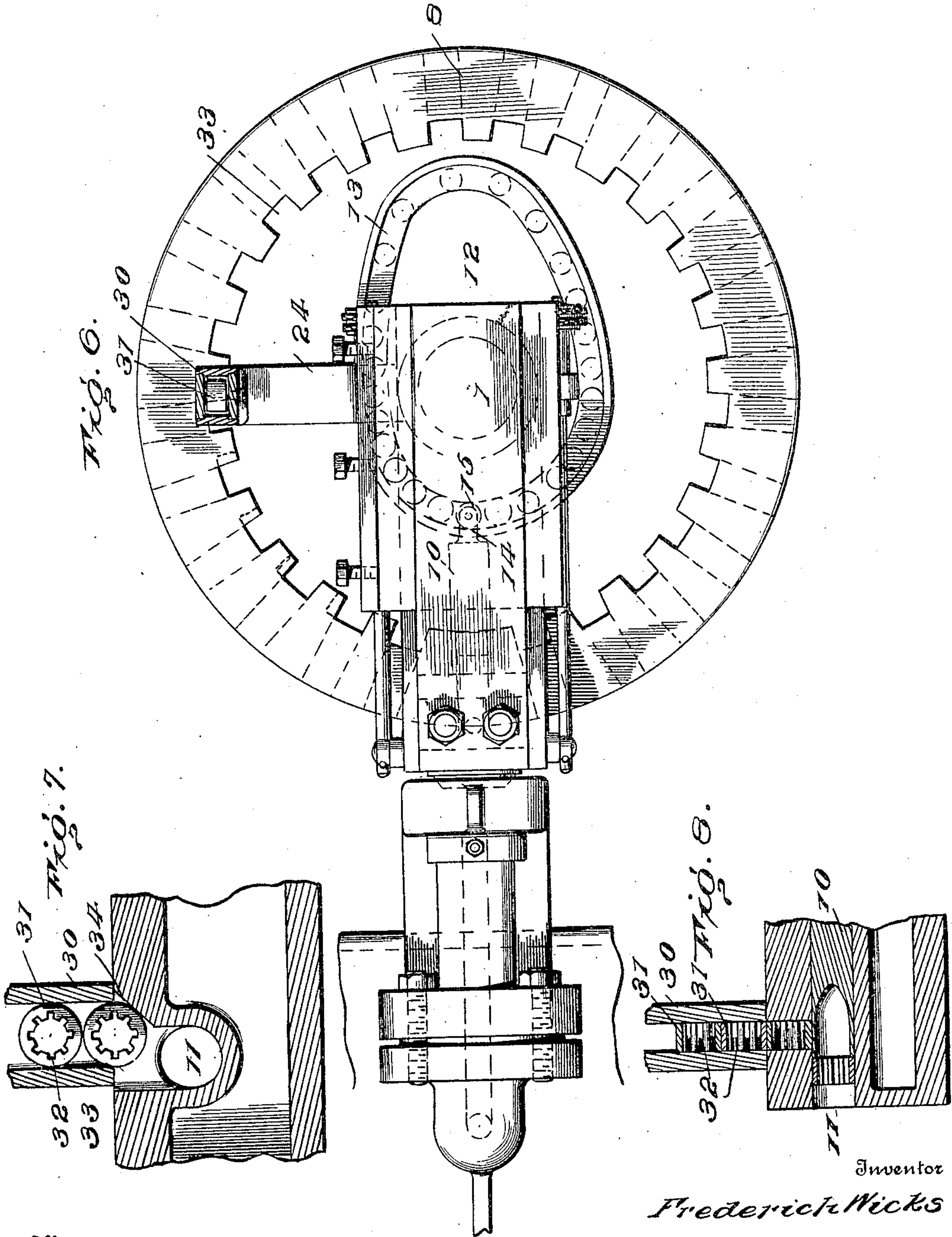
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APPLICATION FILED MAR. 24, 1905.

4 SHEETS—SHEET 4.



Witnesses

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UNITED STATES PATENT OFFICE.

FREDERICK WICKS, OF ESHER, ENGLAND.

APPARATUS FOR CASTING PROJECTILES FOR SMALL-ARMS.

No. 810,832.

Specification of Letters Patent.

Patented Jan. 23, 1906.

Original application filed October 22, 1902, Serial No. 128,295. Divided and this application filed March 24, 1905. Serial No. 251,877.

To all whom it may concern:

Be it known that I, FREDERICK WICKS, a subject of the King of Great Britain and Ireland, residing at Halfway Lodge, Esher, in the county of Surrey, England, have invented certain new and useful Improvements in Apparatus for Casting Projectiles for Small-Arms, of which the following is a specification, for which I have obtained patents in Great Britain, dated October 4, 1902, No. 21,645; in Canada, dated February 2, 1904, No. 85,224; in Victoria, dated September 29, 1903, No. 20,978; in France, dated September 3, 1903, No. 337,869; in Belgium, dated September 3, 1903, No. 172,363; in Italy, dated September 30, 1903, No. 190, Vol. 177, and in Spain, dated October 21, 1903, No. 32,459, and have applied for patents in Australia, dated March 23, 1904, No. 25; in Germany, dated September 3, 1903, No. 21,104, and in Switzerland, dated September 3, 1903, No. 33,140.

My invention relates to an apparatus for casting projectiles for small-arms.

The present application is a division of my application, Serial No. 128,295, filed October 22, 1902.

In the form of my invention shown in this application the molds are formed in a mold-wheel, one of the ends of the molds being formed by a radially-movable plunger by which the projectile after it has been cast is ejected. The molds carried by the mold-wheel move past a nozzle formed in a shield, the shield closing the open ends of the molds, where a jet of molten metal is injected into the molds. Preferably and as shown I provide my machine with a magazine from which a hardened portion composed of copper, nickel, steel, or other suitable material may be fed into the machine. This hardened portion may either form the point of the projectile or the rifling-band.

Referring to the drawings, wherein I show one form of my invention and wherein like reference-numerals are used to designate the same part wherever it occurs, Figure 1 is a vertical sectional view, partly in elevation, showing one form of my apparatus. Fig. 2 is a plan view thereof. Fig. 3 is a detail sectional view of a part of the mold-wheel and the magazine for the heads, showing how the heads are fed into the mold. Fig. 4 is a view similar to Fig. 3, but taken at right angles thereto. Fig. 5 is a vertical sectional view,

partly in elevation, of a modified form of my invention. Fig. 6 is a plan view of Fig. 5. Fig. 7 is a detail sectional view of a part of the mold-wheel and the magazine for the hardened jackets, showing how the jackets are fed into the mold. Fig. 8 is a sectional view similar to Fig. 7, but taken at right angles thereto. Fig. 9 is a view similar to Fig. 7, but showing the position of the parts when the mold is directly under the magazine.

1 is a vertical shaft on which the mold-wheel 2 revolves. The mold-wheel is provided with a suitable gear 3, with which meshes the worm 4, carried by the shaft 5, driven from any suitable source of power.

6 represents passages bored in the shaft 1 for the circulation of cooling-water through the passages 7 in the mold-wheel.

The construction thus far described is substantially the same as that shown and described in my Patent No. 618,926, patented February 7, 1899.

The wheel 2 is provided with an upwardly-extending portion 8, through which extend a series of openings or bores 9, which are radial to the wheel. Sliding in each of these openings or holes is a plunger which, preferably, is formed with a concave inner end 11, the shape of this concavity corresponding to the shape of the head of the projectile to be formed.

12 is a disk fast to the shaft 1, and in the upper face of this disk is cut a cam-groove 13 of a shape best shown in Fig. 2. Each of the plungers is provided with a projection 14, carrying a wheel 15, running in the cam-groove 13. By this construction it will be seen that as the wheel revolves around the shaft 1 the plungers will by the shape of the cam 13 be moved in and out in the bores 9.

16 is an upright frame carried by the shaft 1, and on the top of this upright is mounted a slide 17, adapted to slide horizontally upon the upright 16. From the slide 17 the shield 18 projects downwardly in front of the periphery of the mold-wheel.

19 represents adjusting-screws, by means of which the shield can be brought into proper position relative to the periphery of the mold-wheel. In the center of the shield 18 I provide an orifice 20, in line with the openings 9 in the mold-wheel, and into this orifice projects a nozzle 21, coming from a pump. Preferably this pump is of the type shown in my patent dated March 5, 1901, No. 669,405.

22 is a duct by which the surplus metal delivered by the pump through the nozzle 21 is returned to the melting-pot 23.

In the form of my invention shown in Figs. 1 to 4, inclusive, the mechanism is shown by which the projectile is provided with head 26, of steel or similar material. 24 is a bracket extending out from the side of the upright frame 16. Mounted on the end of this bracket is a magazine 25, adapted to contain the hardened heads 26. The portion 8 of the wheel 2 which is above each of the openings 9 is cut away at 27, as best shown in Fig. 2. These cut-away portions are of such a shape as to allow a head to drop from the magazine into an opening 9 in the mold when the opening passes beneath the magazine. In order to insure the delivery of a single head into each opening, I cut away one side of each cut-away portion at 28. The side which is cut away is the side which first comes under the magazine as the wheel rotates. The groove in the cam 13 will properly position the head so that the piston forming the mold for the head of the bullet will be withdrawn beyond the opening at the bottom of the magazine and toward the center of the mold-wheel, so as to permit the head to drop down into the mold in front of the piston and thereafter be pushed forward in the mold toward the periphery, so that as the molds come in front of the nozzle the heads will be in proper position. The molten metal flows around the neck 28 of the head and will, when the metal cools and hardens, secure the head firmly to the projectile, so that it becomes practically an integral part of the projectile. The mold continues to rotate and carries the projectile around until it is ejected under the influence of the cam 13.

Referring now to Figs. 5 to 9, inclusive, the general construction of the parts is the same as that heretofore described, the difference being that the magazine which is carried by the bracket 24 is of a slightly different shape from the magazine which is adapted to contain the hardened heads and the openings through which the jackets are fed into the molds is of a slightly different shape from the openings through which the heads are fed into the molds. Referring specifically to Figs. 6 to 9, inclusive, 30 is a magazine mounted on the bracket 24, which is adapted to contain hardened jackets 31. These jackets or rifling-bands are in the form of rings and on the interior are provided with the projections 32, by which they are firmly secured to the projectile and prevented from rotating upon the projectile. 33 represents the openings above each mold through which the rifling-bands or jackets are fed in the manner previously described in connection with the feeding of the heads, the openings 33 being each provided with the inclined portion 34. The operation in this form of device is precisely the same

as that previously described in connection with the form of construction shown in Figs. 1 to 4 except that when the ejector 10 moves forward it pushes the rifling-bands ahead of it into position, as shown in the left-hand side of Fig. 5.

Having thus described my invention, what I believe to be new, and desire to secure by Letters Patent, is—

1. In an apparatus for casting projectiles which are provided with a hardened portion, the combination with a series of movable molds each adapted to form a projectile, means for injecting molten metal into the molds, means to move the molds into casting position, and means to feed the hardened portion of a projectile to each mold before it reaches its casting position.

2. In an apparatus for casting projectiles which are provided with a hardened portion, the combination with a rotating wheel provided with a series of molds in its periphery, means for injecting molten metal into the molds, means to move the molds successively into casting position, and means to feed the hardened portion of a projectile to each mold before it reaches its casting position.

3. In an apparatus for casting projectiles which are provided with a hardened portion, the combination with a series of molds each provided with a plunger which forms a part of the mold, means for injecting molten metal into the molds, means to move the molds successively into casting position, means to feed the hardened portion of the projectile to each mold before it reaches its casting position, and means to move the plungers to eject the cast projectiles.

4. In an apparatus for casting projectiles which are provided with a hardened portion, the combination with a rotating wheel provided with a series of molds in its periphery, each mold being provided with a plunger which forms a part of the mold, means for injecting molten metal into the molds, means to move the molds successively into casting position, means to feed the hardened portion of a projectile to each mold before it reaches its casting position, and means to move the plungers to eject the cast projectiles.

5. In an apparatus for casting projectiles which are provided with a hardened portion, the combination with a series of movable molds each adapted to form a projectile, of means to inject molten metal into the molds, means to move the molds successively into casting position, a magazine adapted to contain the hardened portions of the projectiles, the magazine being so located that the molds are brought successively thereunder during their movement to the casting position and an opening in the top of each mold whereby as the molds are brought under the magazine a hardened portion will be delivered into each mold.

6. In an apparatus for casting projectiles
which are provided with a hardened portion,
the combination with a rotating wheel pro-
vided with a series of molds in its periphery,
5 means for injecting molten metal into the
molds, means to move the molds successively
into casting position, a magazine adapted to
contain the hardened portions of the projec-
tiles, the magazine being so located that the
10 molds are brought successively thereunder
during their movement to the casting position

and an opening in the top of each mold where-
by as the molds are brought under the maga-
zine a hardened portion will be delivered into
each mold.

In testimony whereof I have signed my name
to this specification in the presence of two sub-
scribing witnesses.

FREDERICK WICKS.

Witnesses:

LESLIE G. WHEELER,
WALTER E. ROCHE.