

No. 701,640.

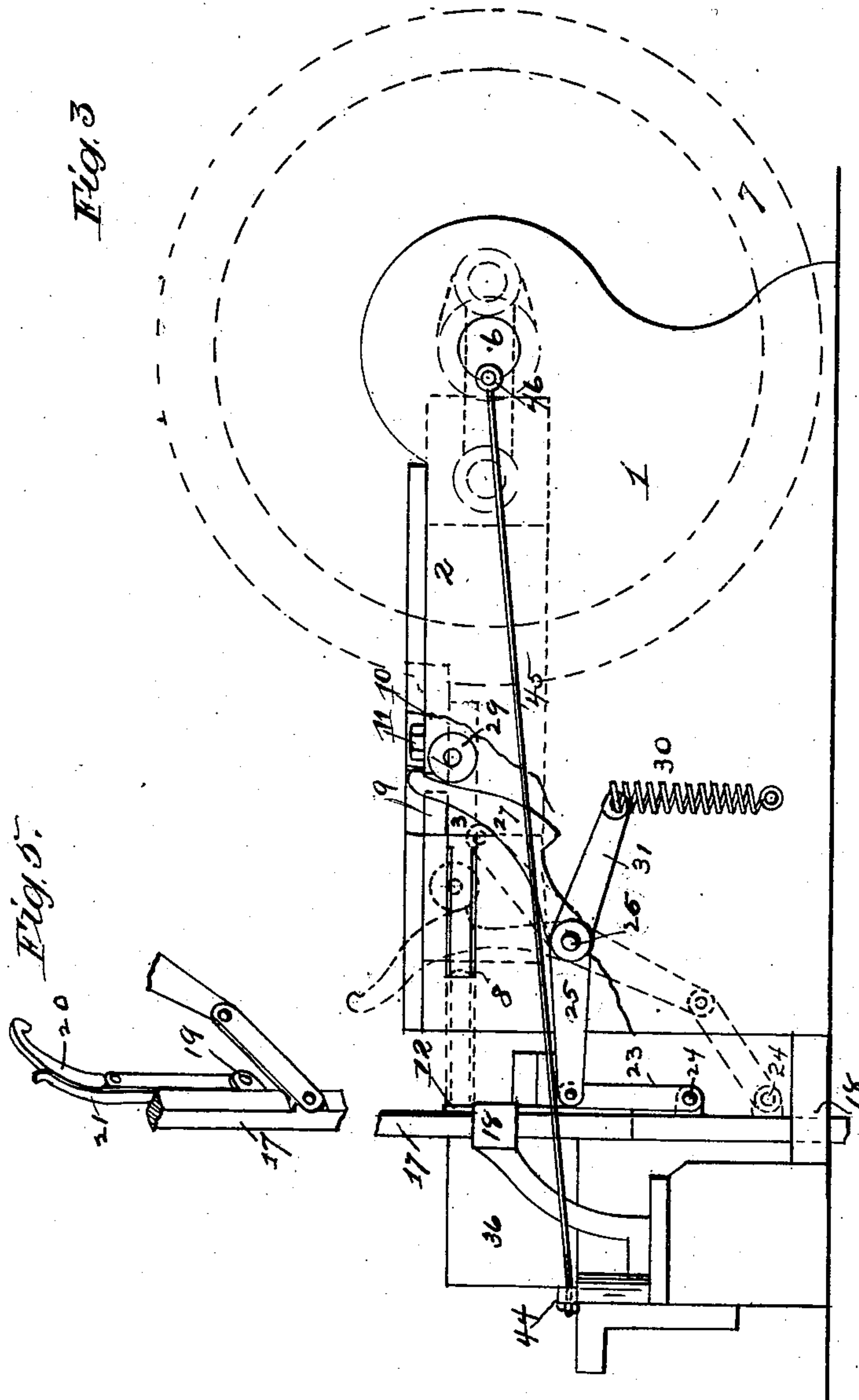
Patented June 3, 1902.

M. T. STANGELAND.  
SOLID DIE RIVET MACHINE.

(Application filed Nov. 13, 1901.)

(No Model.)

2 Sheets—Sheet 2.



Witnesses  
Ruby M. Brown  
Geo. O. Willet

Inventor  
Martin J. Stangeland  
by M. M. Monroe  
Attorney

No. 701,640.

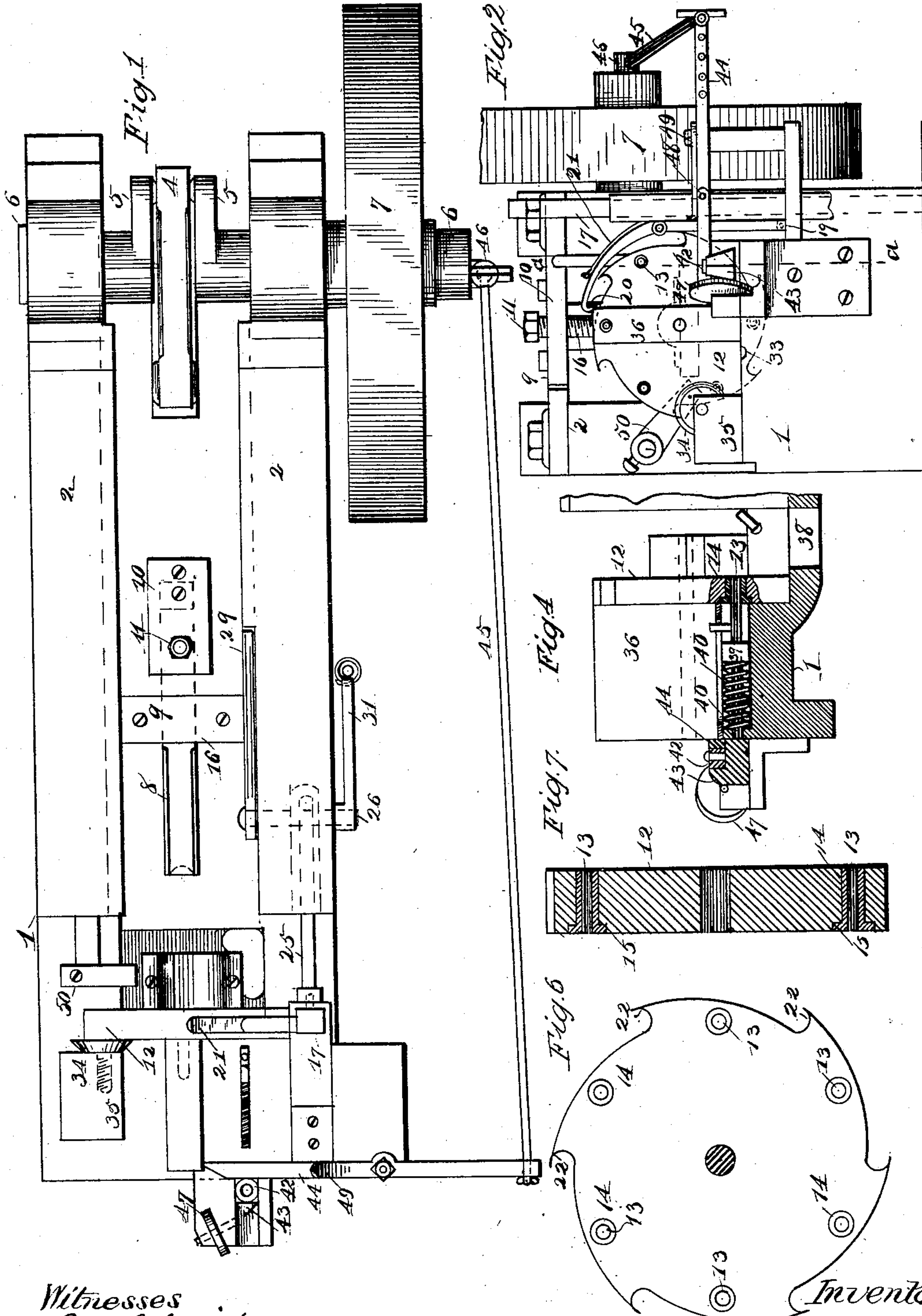
Patented June 3, 1902.

M. T. STANGELAND.  
SOLID DIE RIVET MACHINE.

(Application filed Nov. 13, 1901.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses  
Percy E. Murrell  
Harry B. Sawyer

Inventor  
Martin T. Stangeland  
by Wm. M. Monroe  
Attorney



# UNITED STATES PATENT OFFICE.

MARTIN T. STANGELAND, OF CLEVELAND, OHIO.

## SOLID-DIE RIVET-MACHINE.

SPECIFICATION forming part of Letters Patent No. 701,640, dated June 3, 1902.

Application filed November 13, 1901. Serial No. 82,145. (No model.)

*To all whom it may concern:*

Be it known that I, MARTIN T. STANGELAND, a citizen of Norway, and a resident of Cleveland, county of Cuyahoga, State of Ohio, have  
5 invented certain new and useful Improvements in Solid-Die Rivet-Machines, of which I hereby declare the following to be a full, clear, and exact description, such as will enable others skilled in the art to which it ap-  
10 pertains to make and use the same.

My invention relates to improvements in solid-die machinery for making rivets; and the objects of the invention are to provide means for heading and forming rivets with-  
15 out the objectionable longitudinal fin which is unavoidable in the use of longitudinally-divided dies.

My invention consists in the combination and arrangement of the mechanical devices  
20 for cutting off the blank, for holding and for heading the same, and various details of construction, as hereinafter described, shown in the accompanying drawings, and specifically pointed out in the claims.

25 In the accompanying drawings, Figure 1 is a plan view of the complete machine. Fig. 2 is a front view thereof. Fig. 3 is a side elevation of the same, portions of the bed-plate being broken away to show the detail  
30 construction. Fig. 4 is a longitudinal section, enlarged, through the rotary holder and rivet-removing device on line *a a*, Fig. 2. Fig. 5 is a perspective view of the reciprocating bar and spring-actuated hook which ro-  
35 tates the rivet-holder. Fig. 6 is a side view of the rotary holder or die-head, and Fig. 7 is a central section of same.

In the views, 1 is the bed-plate, provided with guides 2, between which reciprocates the  
40 plunger-head 3, actuated by means of the connecting-rod 4 and crank and crank-shaft 5 and 6. A fly-wheel or fly band-wheel 7 is secured to the outer end of this shaft to give the required momentum to the plunger and  
45 head.

8 is the heading-tool, which is secured to the plunger-head by means of the plates 9 and 10 and set-screw 11.

50 12 is the rotary die-head, which consists of a disk in which are drilled openings 13 to receive and carry the rivet to the heading-tool and in which the rivet is held while the head

is being formed. These openings are preferably formed in thimbles 14, which are flanged at 15 for attachment to the disk. These thim- 55  
bles are made of hard material and of any length necessary, so that the rivets can be as long or short as may be desired. It will be seen that the heading-tool can be set into the plunger-head in the recess 16 as far as re- 60  
quired to accommodate itself to the length of the rivet. The disk is rotated to bring fresh blanks in turn to the header by means of the following device: 17 is a bar vertically recip- 65  
rocating in guides 18. To this bar is pivoted at 19 the hinged hook 20, under continual pressure of the spring 21, which throws it forward so as to engage each projection 22 upon the periphery of the die-head 12 in turn and ro- 70  
tate the head to bring a fresh rivet-blank before the heading-tool. This disk is required to remain stationary while the heading-tool is doing its work, for the reason that the hook should remain quiescent during that period and become active for the purpose of rotat- 75  
ing the disk through another segment as soon as the header is removed. This I accomplish by means of the link 23, pivoted at 24 at one end to the bar and at the other end to the extrem- 80  
ity of the rock-arm 25, mounted upon the rock-shaft 26 in the bed-plate. This shaft is actuated by means of the cam-shaped arm 27, which engages the roller 29 upon the plunger 3 and is moved forward by the roller as the plunger advances. The rock-shaft is returned by 85  
means of the spring 30, attached to the rock-arm 31 and to the bed-plate. It will be seen that as the cam-arm 27 is moved forward the rock-arm 25 will move downward and through the connecting-link 23 will force the bar 17 90  
down until the arm and link are straightened into alinement, when the hook will have pulled the disk over, so as to present the blank rivet to the header. Here it must remain until provided with a head. Hence as 95  
the arm 25 proceeds downward the link and arm form an angle on the other side of the pivotal centers 24 and 26 of the link and rock-shaft, as seen in the dotted lines in Fig. 3, without moving the bar 17 until the arm rises 100  
and the arm and link resume the position upon the other side of the straight line connecting the pivotal centers 24 and 26. The link soon assumes the vertical position and



the hook is in position to engage another one of the projections of the die-head. The relative movements of the die-head and plunger or heading-tool can be varied by altering the position of the roller upon the bed-plate. At 33 a slight groove is made in the bed-plate in which the metal rod from which the rivet-blanks are cut is fed to the opening 13 in the heading-die. As the die rotates this rod comes into contact with the disk cutter 34, pivoted upon an adjacent block 35 and between this block and the die-head, and the portion composing the blank from which the rivet is afterward formed is cut off from the rod as the head rotates. A stop-bar or gage 50 is adjustably secured behind the die to regulate the length of the rivets. When the blank reaches the center line of the heading-tool, it also comes opposite the solid anvil-block 36, in which the die-head is pivoted, and the header advances on the other side to upset the projecting extremity of the blank. In turn the finished rivet is thrown out by means of a forcible thrust from the spring-actuated releasing-pin 37, which at the right moment is released and pushes out the rivet, which falls into an opening 38 in the bed-plate. This pin is seen more clearly in Fig. 4, where it is seen to be provided with a shoulder 39, against which and against the end 40 of the guiding-groove the spring 41 rests. The outer extremity of the pin is provided with a vertical roller 42, and beyond it is an inclined surface 43. This roller is engaged by a rock-arm 44, which is pivoted upon the bed-plate, and by means of a link 45 is connected with the crank-pin 46 upon the extremity of the main shaft. This crank, link, and arm will therefore pull out the releasing-pin, and when the pin has been withdrawn to its full extent a disk 47 will engage the extremity of the arm, which is hinged at 48 for this purpose, and the arm will become disconnected from the roller and the pin will dart forward. A spring 49 returns the arm to its position behind the roller when the crank returns the arm, and the incline 43 leads the arm freely over the roller.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a machine for the purpose described, the combination with a rotary die-head a spring-actuated hook arranged to engage said

die-head, and a reciprocating plunger and heading-tool, of means for operatively connecting the reciprocating plunger with the hook, comprising a vertically-reciprocating bar to which the hook is pivoted, a roller on the plunger, a rock-shaft in the bed-plate, a rock-arm on said shaft, a link connecting said rock-arm and vertical bar, a cam-shaped arm on the rock-shaft arranged to engage the said roller on the plunger and a spring-actuated arm on the rock-shaft, substantially as described.

2. An actuating device for the rotary heading-die, comprising a spring-actuated hook arranged to engage the periphery of the die-head at regular intervals, in combination with means for actuating said hook to rotate said head at regular intervals, consisting of a plunger, a cam-arm engaging said plunger, a rock-shaft on which said cam-arm is mounted, a rock-arm on said shaft, a vertical bar to which said hook is pivoted, and a link connecting said bar and rock-arm, and a return-spring for the rock-shaft, substantially as described.

3. In a solid-die machine for heading-blanks, the combination with a rotary die-head, a reciprocating heading-tool and crank and crank-shaft therefor, of means for ejecting the finished blank or product, consisting of a spring-actuated pin, a pivoted arm arranged to engage said pin and withdraw it from the die-head, and operatively connected with the crank-shaft, and means for releasing the said arm from engagement with the pin when the pin has been withdrawn to its greatest extent, substantially as described.

4. In combination with the die-head, and actuating crank-shaft, of a solid-die machine, means for discharging the perfected blank from the head, consisting of a spring-actuated pin, a roller on said pin, a pivoted arm engaging said roller, a link connecting said arm with a pin upon the crank-shaft, and means for releasing said arm when the pin has been withdrawn from the head, consisting of a roller-disk pivoted in the path of the arm, substantially as described.

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

MARTIN T. STANGELAND.

Witnesses:

WM. M. MONROE,  
GEO. O. WILLET.