

1,306,232.

Patented June 10, 1919.

2 SHEETS—SHEET 1.

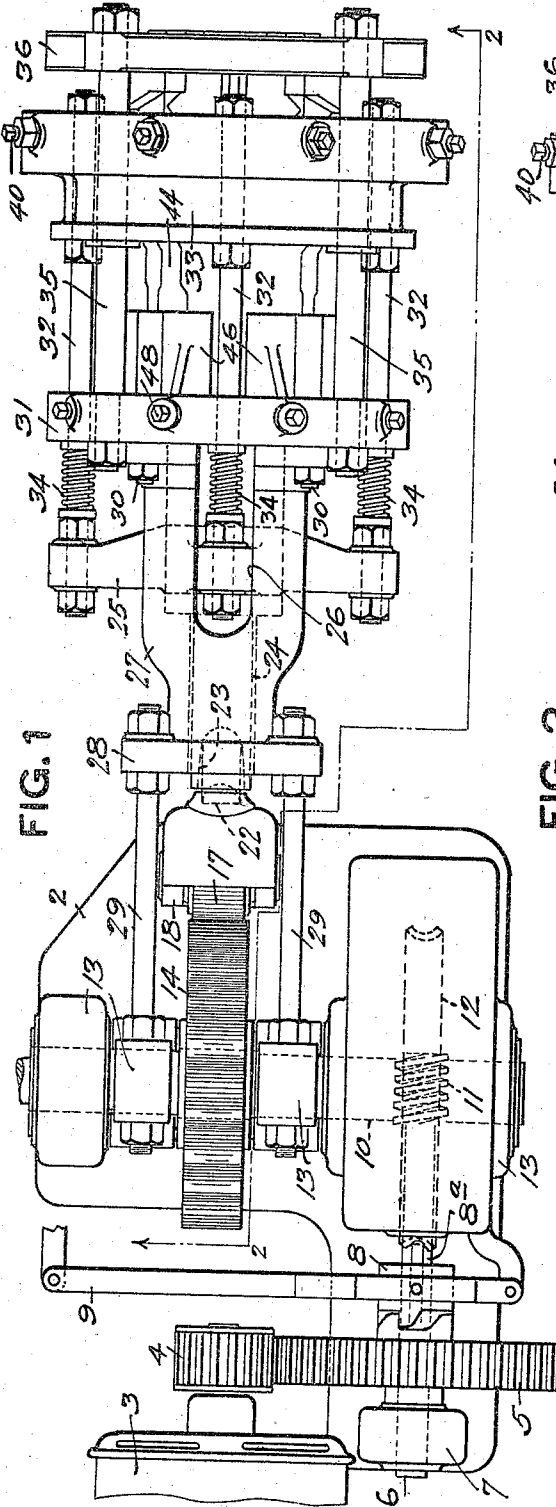


FIG. 1

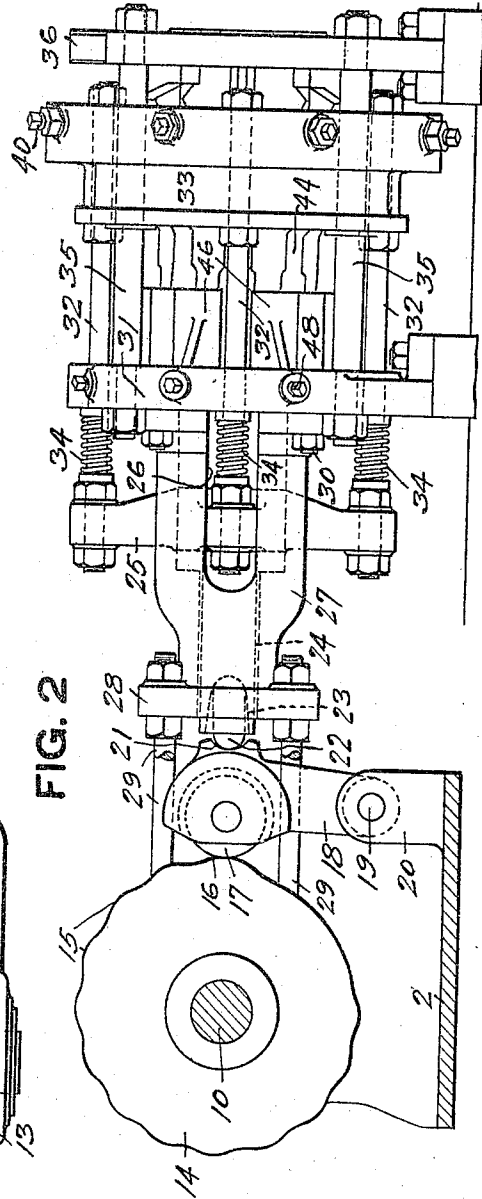


FIG. 2

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SWAGING MACHINE.
APPLICATION FILED JAN. 17, 1918.

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2 SHEETS—SHEET 2.

FIG. 3

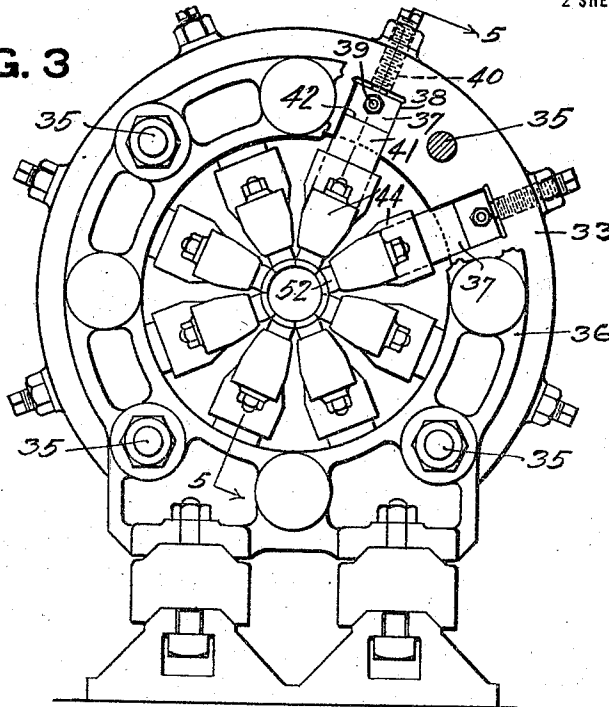


FIG. 4

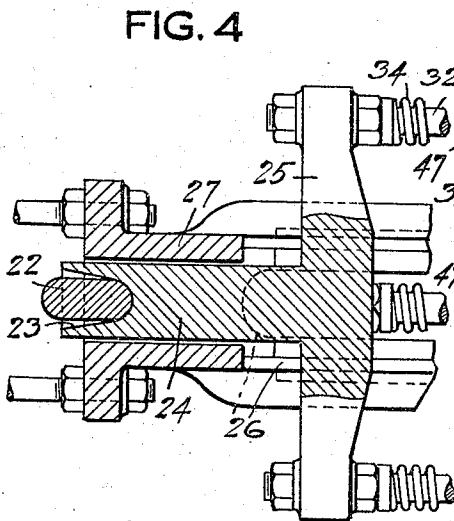
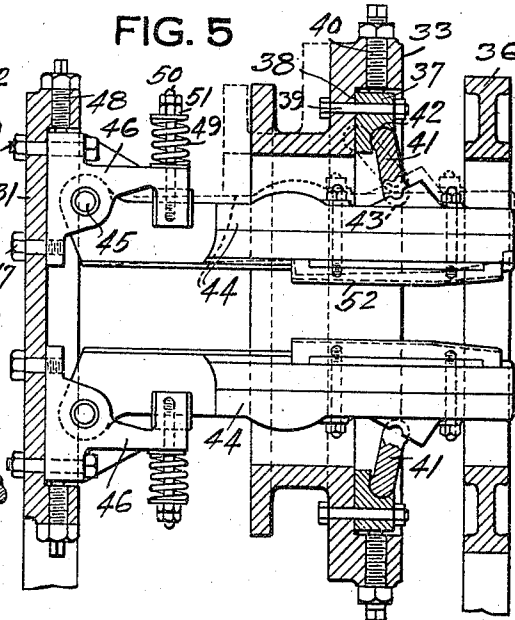


FIG. 5



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UNITED STATES PATENT OFFICE.

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SWAGING-MACHINE.

1,306,232.

Specification of Letters Patent.

Patented June 10, 1919.

Application filed January 17, 1918. Serial No. 212,183.

To all whom it may concern:

Be it known that I, ROBERT W. RUTH, a citizen of the United States, and resident of Belle Vernon, in the county of Fayette, and State of Pennsylvania, have invented a new and useful Improvement in Swaging-Machines, and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to swaging machines.

The object of my invention is to provide a swaging machine which is strong and durable in construction and by which the swaging action is accomplished by a gradual squeezing or pressing action, as distinguished from the ordinary swaging machines now in use in which the article to be swaged is inserted between rapidly-reciprocating dies, whose operation is attended with a great noise and severe jarring action, which is not only nerve-racking to those in the vicinity of such a machine, but is very severe on the wear and tear due to this jolting and jarring action of the parts.

In the accompanying drawings, Figure 1 is a plan view of my improved machine; Fig. 2 is a section on the line 2—2, Fig. 1; Fig. 3 is an end view; Fig. 4 is a longitudinal section of the wabblor and the cross-head; and Fig. 5 is a section on the line 5—5, Fig. 3.

In the drawings, the numeral 2 designates a suitable bedplate in which the driving mechanism is mounted. A motor 3 has the pinion 4 on its armature shaft meshing with the gear-wheel 5 on the stub-shaft 6 mounted in suitable bearings 7. A suitable clutch 8, keyed on the shaft 8^a, is operated by the lever 9 for moving said clutch into and out of engagement with the stub-shaft 6.

The counter-shaft 10 is driven by the worm 11, on the shaft 8^a, meshing with the worm-wheel 12 mounted on said shaft 10. The shaft 10 is mounted in suitable bearings 13.

Mounted on the shaft 10 is the cam-disks 14 with cams 15 formed on its periphery. The cams 15 gradually increase in size, reaching a maximum at 16 to provide for the gradually increased movement of the swaging dies, as more fully hereinafter set forth.

The periphery of the cam-disk 14 engages the idle roller 17 mounted on the rocker-arm 18 which is pivoted at 19 to the support 20. This rocker-arm 18 has the seat 21 to receive the wabblor 22.

This wabblor 22 fits in the recess 23 formed in the end of the plunger portion 24 of the cross-head 25. This cross-head 25 is of the spider form having four arms, which arms pass through openings 26 formed in the guide-frame 27. The guide-frame 27 has the flange 28, the bolts 29 passing through said flange are connected to the bearings 13. The opposite end of said guide-frame 27 is connected by the bolts 30 to the stationary frame 31. In this manner, the guide-frame 27 is securely held in place and acts as a guide for the cross-head 25 and the plunger portion 24.

The cross-head 25 is connected up by bolts 32 to the toggle-ring 33.

Mounted on the bolts 32 and interposed between the cross-head 25 and the stationary frame 31 are the springs 34.

The guide-rods 35 connect the stationary frame 31 with the stationary-frame 36 and said guide-rods pass through openings in the toggle-ring 33, and form guides for said toggle-ring as it moves back and forth in the manner more fully hereinafter set forth.

The toggle-ring 33 has the blocks 37 fitting in seats 38 and held in place by the bolts 39. Adjusting screws 40 are provided for adjusting the position of the blocks 37. These blocks 37 are arranged radially around the toggle-ring 33, and toggles 41 fit into seats 42 in said blocks 37, and the other ends of said toggle engage seats 43 in the swaging-jaws 44.

These jaws 44 are pivoted at their inner ends by the pins 45 to the brackets 46 secured to the stationary frame 31 by bolts 47. Adjusting screws 48 are provided for adjusting the position of the brackets 46.

Springs 49 on the bolts 50 are interposed between the nuts 51 on said bolts and the brackets 46, the inner ends of said bolts being secured into the swaging-jaws 44. These springs act to return the jaws to normal position after they have been advanced in the swaging operation.

Suitable swaging-dies 52 are bolted or otherwise secured to the swaging-jaws 44, said swaging-dies varying in shape according to the shape to be given to the article to be swaged.

The operation of my improved swaging machine is as follows:

Rotary movement is imparted to the cam-disk 14 by throwing the clutch 8 into driving engagement with the power-shaft, and

as said cam-disk rotates, the cams 15 engage in succession the roller 17 and through the rocker-arm 18 impart a longitudinal movement to the cross-head 25 and likewise to the toggle-ring 33 connected thereto. The article to be swaged, having been properly heated,—and let it be supposed that in this case the article consists of a short tubular section which is to be swaged by the dies 52,—is inserted between the dies, and as the toggle-ring 33 is advanced by the movement of the cross-head 25, the toggles 41 acting on the swaging-jaws 44 will move said jaws inwardly and the swaging-dies will be forced against the article held in position therein. As stated above, the cams 15 of the cam-disk 14 gradually increase in size so that the inward movement of the swaging-jaws is slightly greater each time said toggle-ring advances, and the swaging action takes place gradually by a squeezing or a pressing action until the maximum cam 16 engages the roller 17 and the greatest movement is imparted to the swaging-jaws when the swaging action is completed.

By this means for causing successively progressive radial movement to the dies, the swaging is accomplished by a gradual squeezing or pressing action, and the swaging takes place without the awful din and clatter which is present in the swaging machines ordinarily employed where there is a quick reciprocating action of the swaging-dies; and furthermore, by my improved machine, wear and tear on the parts is reduced to a minimum due to the fact that there is none of the chattering or racking action such as is present in machines of the reciprocating type.

It will be apparent that the adjustments may be quickly made for taking care of different sized articles to be swaged for the amount of swaging to be done to any article, and that the dies may be readily changed to impart different sizes, shapes or tapers to the articles to be swaged.

What I claim is:

1. In a swaging-machine, the combination of radially-arranged movable swaging-dies, and means for causing successively progressive radial movement to said dies.

2. In a swaging-machine, the combination of radially-arranged movable swaging-dies, toggle-mechanism connected to said dies, and means for operating said toggle-mechanism whereby successively progressive radial movement is imparted to said dies.

3. In a swaging-machine, the combination of radially-arranged movable swaging-dies,

a toggle-ring, toggles interposed between said ring and said dies, and means for moving said toggle ring whereby successively progressive radial movement is imparted to said dies.

4. In a swaging-machine, the combination of radially-arranged movable swaging-dies, a spring-actuated toggle-ring, toggles interposed between said ring and said dies, and means for moving said toggle ring whereby successively progressive radial movement is imparted to said dies.

5. In a swaging-machine, the combination of radially-arranged movable swaging-dies, a toggle-ring, toggles interposed between said ring and said dies, a cross-head connected to said toggle-ring, and means for moving said cross-head whereby successively progressive radial movement is imparted to said dies.

6. In a swaging-machine, the combination of radially-arranged movable swaging-dies, a toggle-ring, toggles interposed between said ring and said dies, a rotary cam-disk having cams progressively-increasing in size, and connections from said cam to said toggle-ring whereby successively progressive radial movement is imparted to said dies.

7. In a swaging-machine, the combination of radially-arranged movable swaging-dies, a toggle-ring, toggles interposed between said ring and said dies, a cross-head connected to said toggle-ring, a cam-disk having gradually-increasing cams, connections between said cam-ring and said cross-head, whereby successively progressive radial movement is imparted to said dies.

8. In a swaging-machine, the combination with radially-arranged movable swaging-dies, a toggle-ring, toggles interposed between said ring and said dies, a cross-head connected to said toggle-ring, a plunger portion on said cross-head having a seat therein, a wobbler engaging said seat, a rocker-arm engaging said wobbler, and a cam-disk having cams progressively increasing in radius engaging said rocker-arm.

9. In a swaging-machine, the combination of radially-arranged, pivotally-mounted, spring-actuated swaging-dies, and means for causing successively progressive radial movement to said dies.

In testimony whereof I the said ROBERT W. RUTH, have hereunto set my hand.

ROBERT W. RUTH.

Witnesses:

ROBT. D. TOTTEN,
JOHN F. WILL.