

M. J. CHAPLIN.
 RIVETING MACHINE.
 APPLICATION FILED NOV. 18, 1913.

1,144,397.

Patented June 22, 1915.

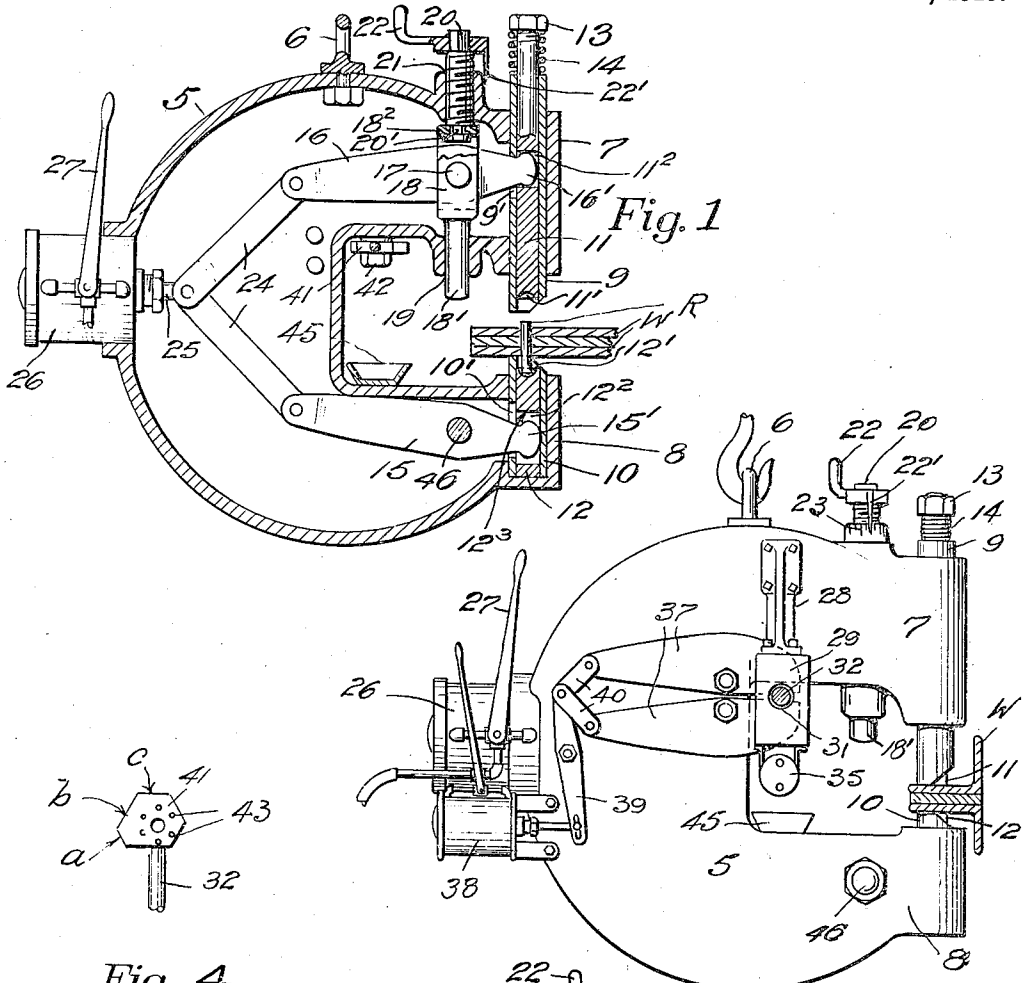


Fig. 1

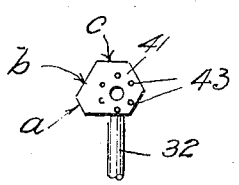


Fig. 4

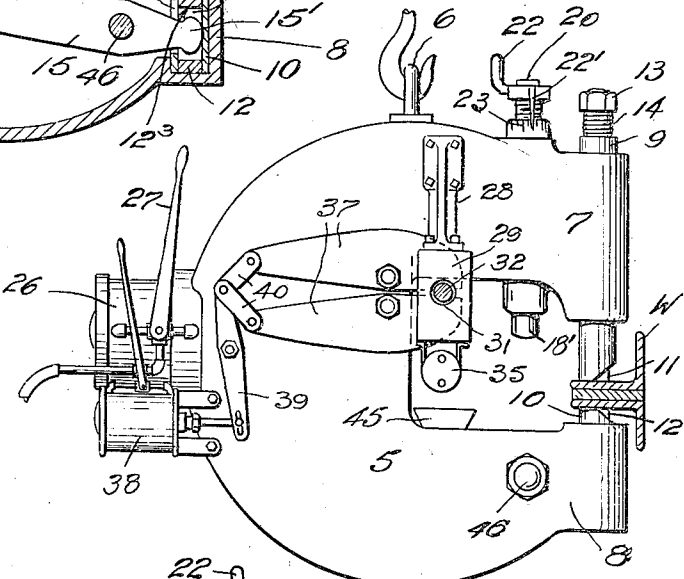


Fig. 2

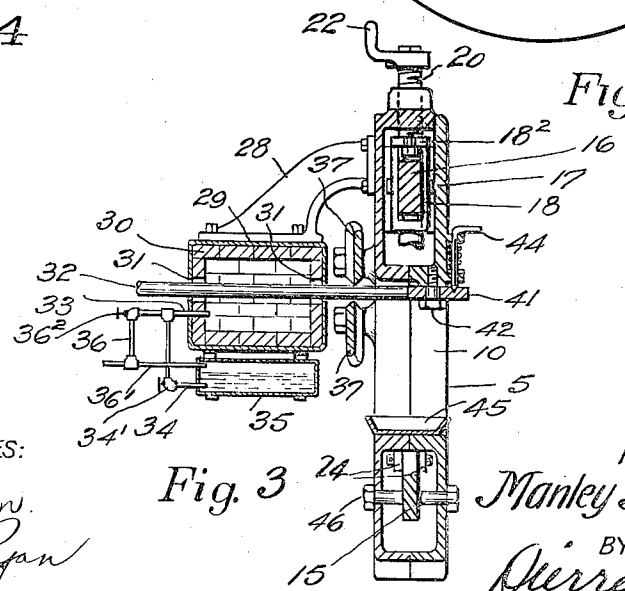


Fig. 3

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MANLEY J. CHAPLIN, OF SEATTLE, WASHINGTON, ASSIGNOR OF ONE-HALF TO FRED C. FURTH, OF SEATTLE, WASHINGTON.

RIVETING-MACHINE.

1,144,297.

Specification of Letters Patent. Patented June 22, 1915.

Application filed November 18, 1913. Serial No. 801,591.

To all whom it may concern:

Be it known that I, MANLEY J. CHAPLIN, a citizen of the United States, residing at Seattle, in the county of King and State of Washington, have invented certain new and useful Improvements in Riveting-Machines, of which the following is a specification.

This invention relates to riveting machines; and its object is the perfecting of machines of this class where rapidity and facility of operation are essential conditions in the economical riveting of structural work on an extensive scale.

The invention is illustrated in the accompanying drawings, wherein—

Figure 1 is a longitudinal vertical section of a machine embodying the present invention. Fig. 2 is a side elevation of the same. Fig. 3 is a transverse vertical section of Figs. 1 and 2. Fig. 4 is a plan view of the adjustable stop for regulating the lengths into which the bar-stock is to be cut.

Referring to the drawings, 5 indicates the frame or casing for a portable riveting machine and, as illustrated, is provided with a swivel eye-bolt 6 whereby the machine is supported.

The casing is formed with forwardly protruding jaws 7 and 8 which are disposed in spaced relations to afford a gap therebetween. Said jaws are bored to accommodate axially alined upper and lower tubular bushings 9 and 10 for the dies 11 and 12 which are provided with recesses 11¹ and 12¹ on the opposing ends. The die 11 extends for a distance above the top of the associated bushing 9 and has its upper end screw-threaded to receive a nut 13. A spring 14 is interposed between said nut and the bushing 9 and tends to push the latter downwardly with respect to the die 11.

15 represents a lever fulcrumed to a pin 46 rigidly secured to the casing and having one of its arms, 15¹, extending through a slot 10¹ provided in bushing 10 into a slot 12² provided in the die 12. The depth of the die-slot is greater than that of the lever-arm 15¹ and is disposed relatively to such arm so that the latter will have a certain amount of upward movement before engaging

against the top 12³ of the die to elevate the same.

16 is a lever fulcrumed to a pin 17 and has one arm 16¹ extending through a slot 9¹ of bushing 9 into a slot 11² of die 11. 55

The slot 11² is of substantially the same depth as that of the portion of the lever-arm 16¹ which extends thereinto.

The pin 17 is carried in a housing 18 having a depending stud 18¹ which is fitted for vertical movements in a guide hole 19 provided in the casing. 60

20 is a screw engaging in a threaded hole 21 in the casing. The upper member 18² of said housing is provided with a slot to receive the neck 20¹ of said screw and whereby said housing member is engaged between the screw-shoulders at the end of the neck, thus connecting the housing to the screw for vertical movements. 70

22 is a crank-handle secured to the upper end of the screw for rotating the same, and 22¹ is a finger provided on the handle for designating the circular movement of the screw with reference to the index marks 23 provided on the casing. 75

The levers 15 and 16 are operated through the medium of toggle links 24 from the piston-rod 25 of a suitable motor or power cylinder 26 which is actuated by a fluid, 80 such as steam or compressed air. The cylinder 26 is rigidly connected to or formed integral with the machine casing 5.

27 represents the handle for operating a three-way valve for admitting the power agent to either end of the cylinder, as required. 85

Included in the invention are devices for heating a bar of iron or steel and cutting the same into predetermined lengths for rivets; to which end I secure to, and at one side of the casing, as by bracket 28, (Fig. 3) a furnace comprising a shell 29 which is lined with fire-brick 30, or an equivalent. Apertures 31 are formed in opposite sides of the furnace so that a metal bar, as 32, may be progressively moved therethrough when properly heated by the fire obtaining within the furnace from a gas or oil-burner. 95

As illustrated, the burner nozzle 33 is con- 100

ected by an oil supply pipe 34 with an oil reservoir 35 and also with a steam or compressed air supply-pipe 36 whereby the oil is jetted into the furnace in the well-known manner. The pipe 36, moreover, has a branch 36¹ extending into the reservoir to furnish sufficient pressure therein to feed the oil to said nozzle. By adjusting valves 34¹ and 36² on the respective pipes, the proper proportions of steam and oil may be regulated to produce the requisite heat within the furnace.

37 represent a pair of shear members for cutting the bar as it is progressively pushed from the furnace. Said shear members are operated from a power cylinder 38 through the medium of a lever 39 and toggle links 40. Said shear members are positioned intermediate the furnace and a gage device consisting of a polygonal plate 41 which is rotatably mounted upon a pin 42 secured to the machine casing. The axis of the plate's rotation is arranged with respect to the plate edges so that the latter, when turned toward the shears, will be at selected distances from the shears as, say, one, two, three, etc. inches for the respective edges *a*, *b*, *c*, etc.

43 represents spaced holes provided in the plate 41 for a spring-pressed latch 44 which is employed in securing the plate in set position.

The operation of the invention is as follows: A bar 32 is inserted in the furnace and subjected to the heat produced from the furnace until the bar is at a suitable temperature. The bar is shoved to protrude the end thereof beyond the furnace and against the previously adjusted gage-plate 41. The shears are then actuated through the agency of the power cylinder 38 and the mechanical connections 39 and 40 with the shear members 37, to cut off a piece of the bar which falls into a receptacle or pan 45 provided therefor. The operator then inserts such piece of the bar into the holes for the rivet provided in the work *W*, Figs. 1 and 2, when such holes are in alinement with each other and with the axis of the die 12. Under such conditions, the work is juxtaposed with the lower bushing 10 and the bar-piece *R* will be supported in the recess 12¹ of the die. The operator then manipulates the handle 27 so as to admit the power medium at the rear end of cylinder 26 resulting in the piston-rod being urged forwardly to force the knuckle of the toggle elements 24 forwardly, which actuates the levers 15 and 16 to cause the dies 11 and 12 and the associated bushings 9 and 10 to approach each other.

More particularly, the die 11 and bushing 9 are primarily moved downwardly until the bushing is brought against the work,

whereupon the work is clamped between the upper and lower bushings.

The levers 15 and 16 continuing their travel then move the dies to engage the ends of the piece *R*, to head the same at both ends. The spring 14 yields to the independent movement of the die 11 and also to a relatively small upward movement of the bushing 10 as the riveting of the piece *R* upon the work is being finished. When completed, the handle 27 is operated to effect the opening of the dies for the removal of the work.

The invention is of simple and strong construction and it is thought that it will prove to be of extreme usefulness in many operations about a shop or at the place of erection of bridges or other structures.

Having described my invention, what I claim, is—

1. In a machine of the class described, in combination, a machine frame, levers pivoted in said frame, toggle links each pivoted at one end to one of said levers and at its other end to the piston rod of a power cylinder, a pair of dies operated by said levers, and bushings therefor mounted for independent reciprocatory movements in the frame, whereby the work is first clamped between the bushings, and the dies are subsequently influenced to effect the heading of a bolt therebetween.

2. In a machine of the class described, the combination with the machine frame, of a pair of dies, bushings for the respective dies and axially movable in the frame, yielding connection between one of the dies and the associated bushing, and power-driven means engageable with the dies for operating both the dies and the bushings thereof.

3. In a machine of the class described, in combination, a machine frame, a pair of axially alined bushings mounted in said frame for endwise movements, dies having recessed ends mounted in the respective bushings, a pair of levers pivoted in said frame intermediate their ends, toggle links respectively pivoted at one end to said levers and at their other ends to the piston rod of a power cylinder, slots in said dies, and bushings for the reception of the free ends of said levers whereby said dies and bushings are given an endwise motion to first clamp the work between the bushings and to subsequently actuate the dies to produce heads on both ends of a bolt which is inserted within a hole provided in the work.

4. In a machine of the class described, a pair of axially alined riveting dies having recesses in the opposing ends thereof, a bushing for each die, a spring connection between one of said dies and the associated bushing, and power-actuated means adapted

to actuate said bushings to clamp the work therebetween and subsequently cause the dies to become operative to produce heads on both ends of a bolt extending through such
5 work.

5. In a machine of the class described, the combination with the machine frame, bushings mounted therein, a rivet-heading die in each of said bushings, levers for suc-
10 cessively actuating said bushings and dies,

an adjustable fulcrum support for one of said levers, a power cylinder, and operative connections including a pair of toggle elements for actuating said levers.

Signed at Seattle, Wash., this 6th day of 15
Nov., 1913.

MANLEY J. CHAPLIN.

Witnesses:

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HORACE BARNES.