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W. H. VAN SICKEL.

PNEUMATIC RIVETER.

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FIG. 1.

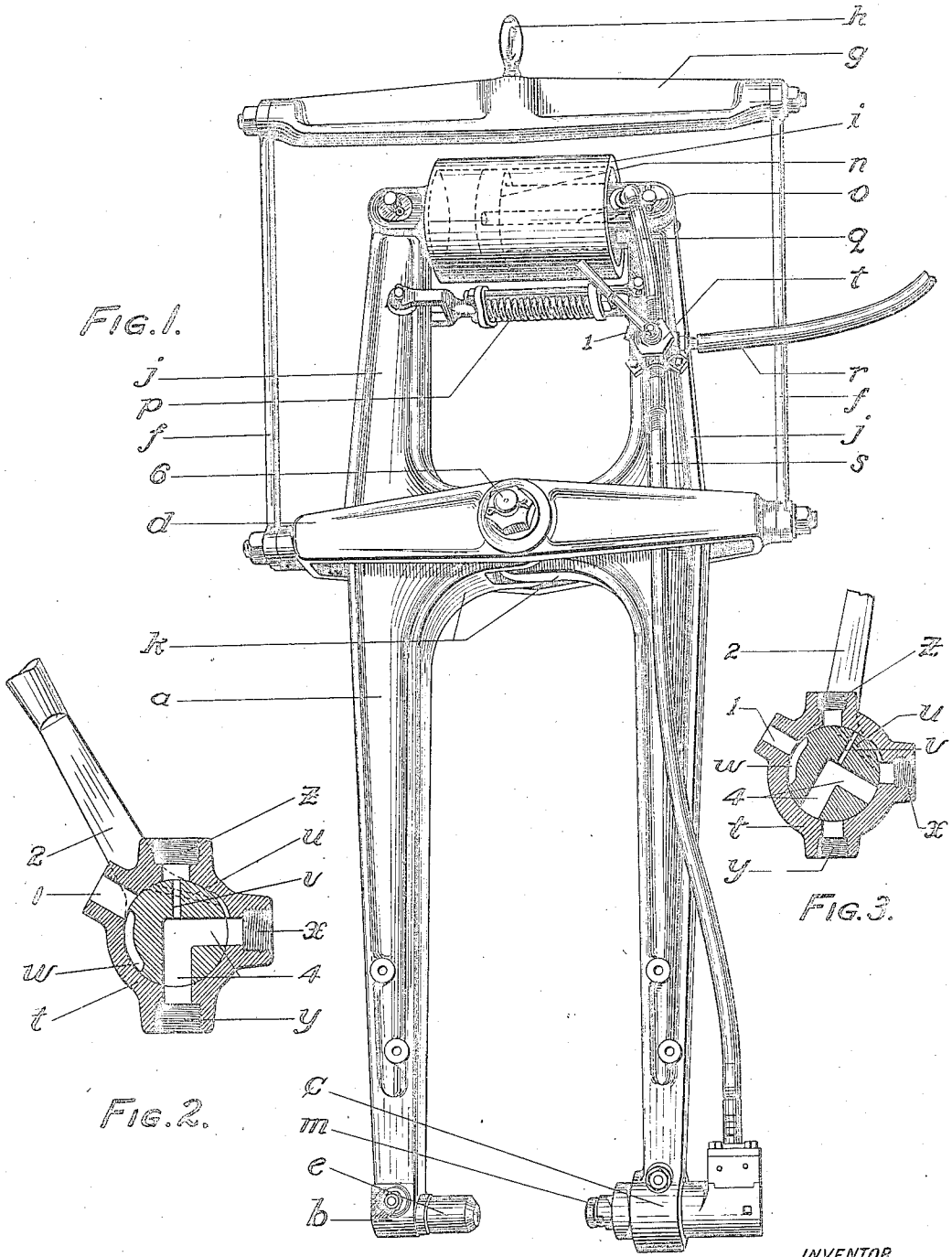


FIG. 2.

FIG. 3.

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PNEUMATIC RIVETER.

No. 890,108. Specification of Letters Patent. Patented June 9, 1908.

Application filed April 7, 1906. Serial No. 310,422.

To all whom it may concern:

Be it known that I, WILBER H. VAN SICKEL, a citizen of the United States, residing at Philadelphia, county of Philadelphia, and State of Pennsylvania, have invented a new and useful Improvement in Pneumatic Riveters, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which form a part of this specification.

The object of my invention is to produce a pneumatic riveting machine, whereby the rivet may be grasped between the riveting tool and the anvil and the riveting tool operated by means of air controlled from a single valve, so that by turning this valve, air is admitted to operate the mechanism to cause the rivet to be gripped between the die and the riveting tool and a further movement admit air to the riveting tool to produce the riveting.

My invention further consists in certain details of construction, which will hereinafter be fully set out.

I will first describe the embodiment of my invention, illustrated in the accompanying drawings and then point out the invention in the claims.

In the drawings: Figure 1 is a front view of my improved riveting machine. Fig. 2 is a sectional view of the controlling valve in one position. Fig. 3 is a sectional view of the valve in another position.

The riveting tool comprises two jaws having the extensions *k*, which are pivotally attached at 6 and between the members of the supporting yoke *d*. This support *d*, by means of the rods *f*, is secured to the bar *g*, which bar *g* has an eye *h*, by which it may be suspended from a hook on any desired support. The lower end *a* of one jaw is provided with the orificed seat *b* for the anvil *e*, while the lower portion *a* of the other jaw is provided with a seat *c* for the pneumatic riveter *m*. The upper end *j* of the first mentioned jaw is pivoted to the cylinder *i*, in which is the piston *n*, which is pivotally attached to the upper portion *j* of the other jaw. The stem of this piston and the head is orificed or provided with a passage *o*, which passage *o* is in connection with a pipe *q*.

r is a pipe leading to the source of compressed air supply, not shown, and *s* is a pipe leading to the pneumatic riveter *m*.

t is a valve at the juncture of the pipes *q*, *r* and *s*. This valve has in it the passages 4, *u* and *v* and the cut-away portion *w*. The valve casing has a port *x* in connection with a pipe *r*; a port *y* in connection with a pipe *s* and a port *z* in connection with a pipe *q*. It also has an exhaust port 1.

2 is an operating handle for the valve.

p is a spring between the upper portions *j* of the jaws, tending to draw the upper ends together and thus spread the lower ends of the jaws.

As may be seen, when air is admitted by the valve *t* to the pipe *q*, the air passes to the back of the head of the piston, reacting between the cylinder and the piston, causing the upper portions of the jaws to spread and the lower portions in which are carried the anvil and the riveter, to be brought together against the rivet. This movement is against the action of the spring *p*, and when the air is exhausted from the cylinder, the spring moves the upper portions of the jaws together, spreading the lower portions.

Taking now the cycle of operation of the valve *t* and starting with the valve in the position it is shown in Fig. 3, in which position air passes from the port *x* through the passage *u*, port *z*, to the cylinder and the lower portion of the jaws will be brought together, grasping the rivet between the die and the pneumatic riveter. A further movement of the valve brings it to the position shown in Fig. 2, in which there is connection between the port *x*, passage 4 to the port *y* and thus through the tube *s* to the pneumatic riveter, and the riveter is operated. The air is still being admitted to the cylinder *i* through the passage *v*, the passages *u* and *v* being so correlated to each other that at the time the passage *u* has become inoperative to connect *x* and *z*, passages *v* and 4 will connect the ports *x* and *z*. In the reverse cycle of the valve, or return movement, as may be seen, air is first cut off from the pneumatic riveter and in the further movement air is cut off from the cylinder, and the cylinder is then connected with the exhaust port 1, through cut away portion *w*. In this last position the spring will spread the lower portion of the jaws. It may thus be seen, by the movement of this valve, not only is air admitted to bring the jaws against the rivet, but also to start the pneumatic riveter, and this is done in a fixed

sequence, so that the pneumatic riveter is operated only after the jaws have been clamped upon the rivet and the pressure by which this is secured is maintained, during the riveting, and only released after the operation of the riveter has been stopped.

The parts are constructed of such weight that the pivot point 6 is the center of gravity of the machine which may thus be supported either vertically or horizontally. If supported horizontally, the machine is connected to its support directly from the yoke *d*, the rods *f* and bar *g*, being omitted.

Having now fully described my invention, what I claim and desire to protect by Letters Patent is:

1. In a riveting machine, in combination, jaws pivoted together intermediate of their length, a pneumatic riveter carried by the lower portion of one jaw, an anvil carried by the lower portion of the other jaw, a pressure device for operating said jaws, there being passages, one from the source of pressure supply, another to the jaw-operating device, and another to the riveter, a valve casing in which said passages terminate, a valve in said casing controlling the connection between the pressure supply and the riveter and jaw-operating device, means whereby the valve in its movement in one direction first connects the jaw-operating device with the pressure supply passage and then connects the riveter passage with the pressure supply, and means to maintain connection between the pressure supply and the said jaw-operating device during connection between the pressure supply and the riveter.

2. In a machine of the character described, the combination with the pivoted jaws, the riveter and the jaw-operating device, there being passages, one to the riveter, another to the jaw-operating device and another from the pressure supply, of a valve casing in which said passages terminate, a valve in said casing, having passages adapted in the movement of the valve to first connect the pressure supply with the jaw-operating device passage and then to connect the said jaw-operating device passage and riveter passage with the pressure supply.

3. In a machine of the character described, the combination with the pivoted jaws, the riveter and the jaw-operating device, there being passages one to the riveter, another to the jaw-operating device and another from the pressure supply, of a valve casing in which said passages terminate, said valve casing having an exhaust, a valve in said casing having passages adapted in the movement of the valve in one direction to first connect the pressure supply with the jaw-operating device passage and then to connect the jaw-operating device passage and riveter passage with the pressure supply and in the movement in the other direction to connect the jaw-operating device passage with the exhaust.

4. In a machine of the character described, in combination with the jaws pivoted together, intermediate of their length, and carrying at their lower ends, respectively, the riveter and the anvil, of a cylinder between said jaws above said pivot and connected to one of said jaws, a piston pivoted to the other jaw, there being passages one from said cylinder, another passage from said riveter, and another from pressure supply, a valve casing in which said passages terminate, a valve in said casing adapted, in its movement, to successively connect said pressure supply with the cylinder passage and simultaneously with the riveter passage and the cylinder passage.

5. In a machine of the character described, in combination with the jaws, pivoted together intermediate of their length, and carrying at their lower ends, respectively, the riveter and the anvil, of a cylinder between said jaws, above said pivot, and connected to one of said jaws, a piston pivoted to the other jaw, there being passages, one from said cylinder, another from said riveter, and another from source of pressure supply, a valve casing in which said passages terminate, said valve casing having an exhaust, a valve in said casing adapted in the movement in one direction, to successively connect said pressure supply passage with the cylinder passage and with the riveter passage, and in the other direction to successively cut off connection between the pressure supply passage and the riveter passage and the cylinder passage and connect the cylinder passage with the exhaust.

6. In a riveting machine, in combination, two jaws, a supporting yoke, extensions from said jaws pivoted together and to the supporting yoke central of its length, an anvil and riveter connected respectively to the lower ends of said jaws and jaw-operating mechanism connected to the upper portion of said jaws.

7. In a riveting machine, in combination, two jaws, a supporting yoke, extensions from the said jaws pivoted together and to and between the members of the supporting yoke central of its length, an anvil and riveter connected respectively to the lower ends of said jaws and jaw-operating mechanism connected to the upper portion of said jaws.

8. In a riveting machine, in combination, two jaws, a supporting yoke, extensions from the said jaws pivoted together and to the supporting yoke central of its length, a rod secured to each end of the supporting yoke, and a bar to which the other end of said rods are secured, an anvil and riveter connected respectively to the lower ends of said jaws and jaw-operating mechanism connected to the upper portion of said jaws.

9. In a riveting machine, in combination, two jaws, a supporting yoke, extensions from the said jaws pivoted together and to and between the members of the supporting yoke, central of its length, a rod secured to each end of the supporting yoke, and a bar to which the other end of said rods are secured, an anvil and riveter connected respectively to the lower ends of said jaws and jaw-operating mechanism connected to the upper portion of said jaws.

In testimony of which invention, I have hereunto set may hand, at Philadelphia, on this 5th day of April, 1906.

WILBER H. VAN SICKEL.

Witnesses:
M. M. HAMILTON,
E. E. WALL.