Dec. 6, 1932. P. H. LANGE 1,890,039

SHAPING AND FLANGING MACHINE

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Fig. 1

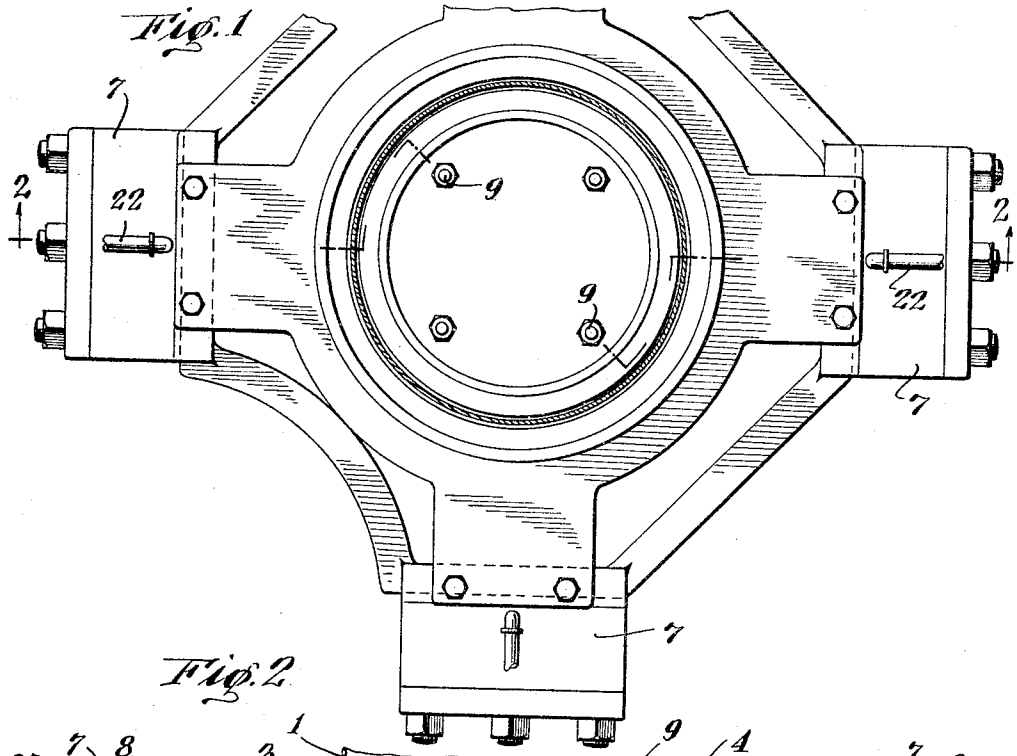
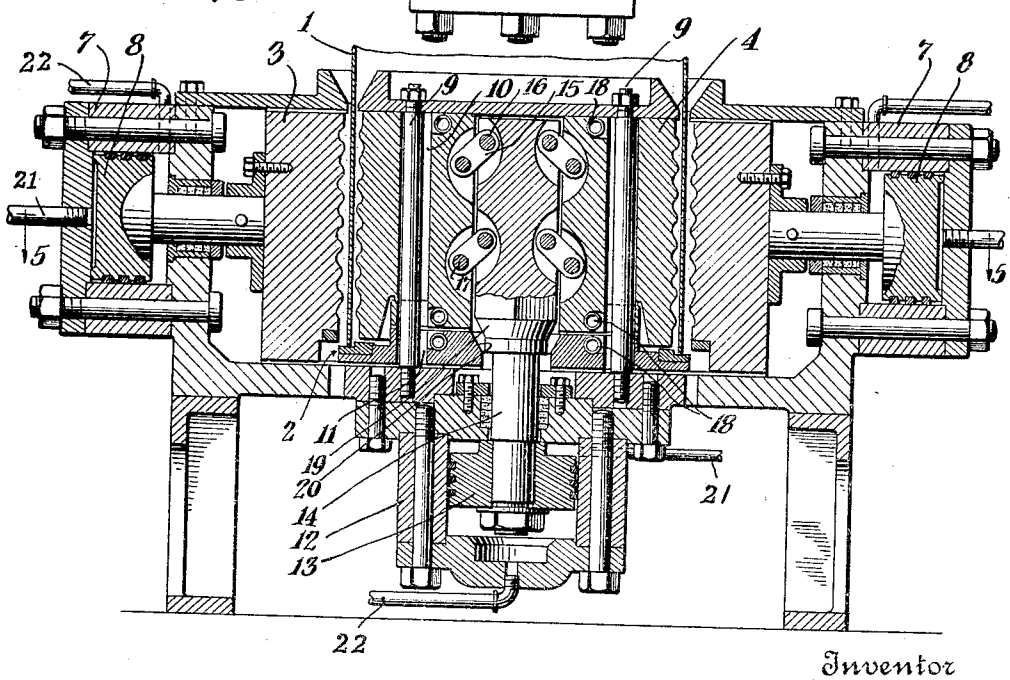


Fig. 2



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Fig. 3

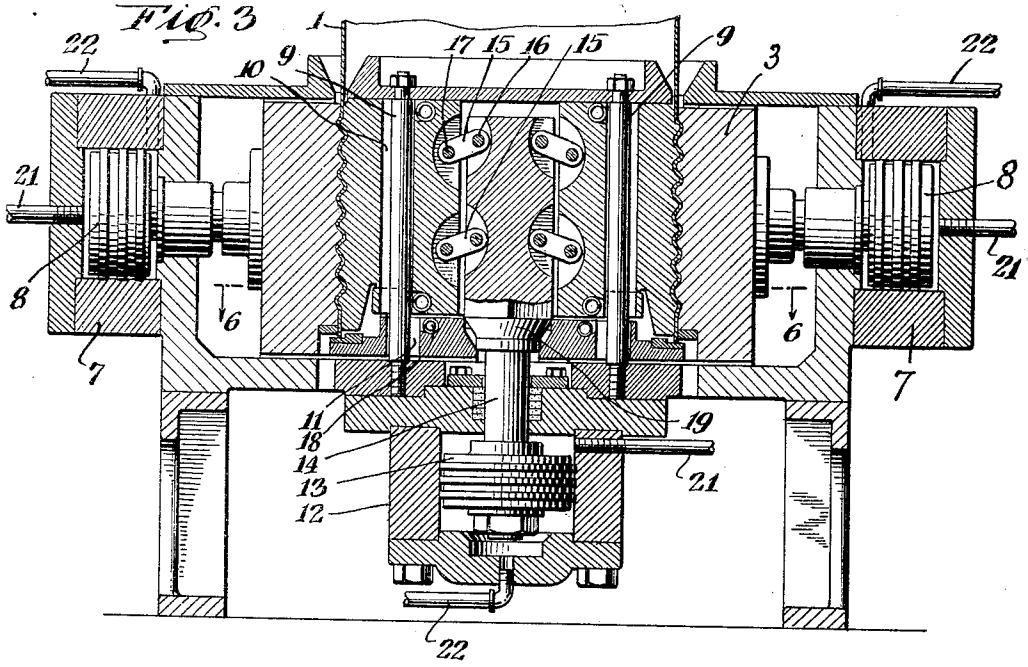
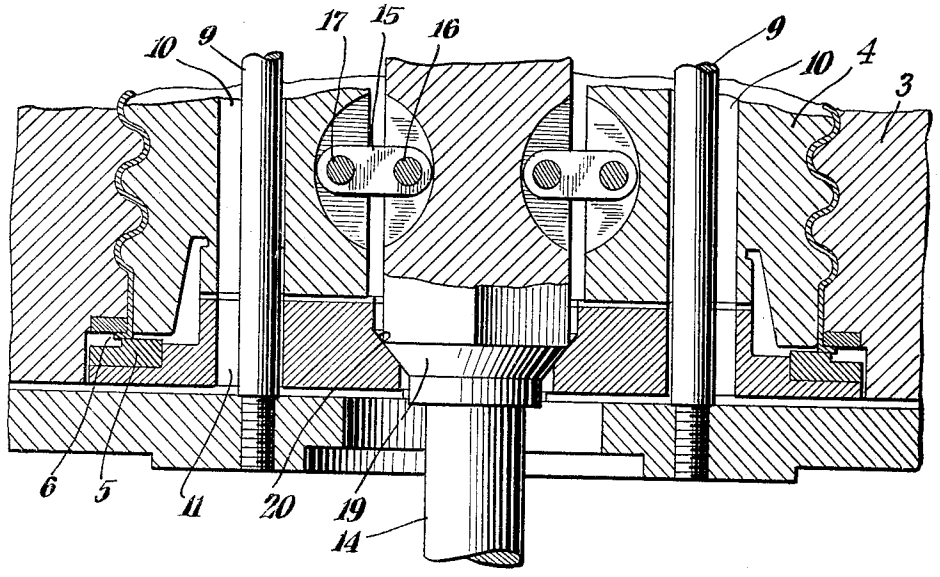


Fig. 4



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Fig. 5

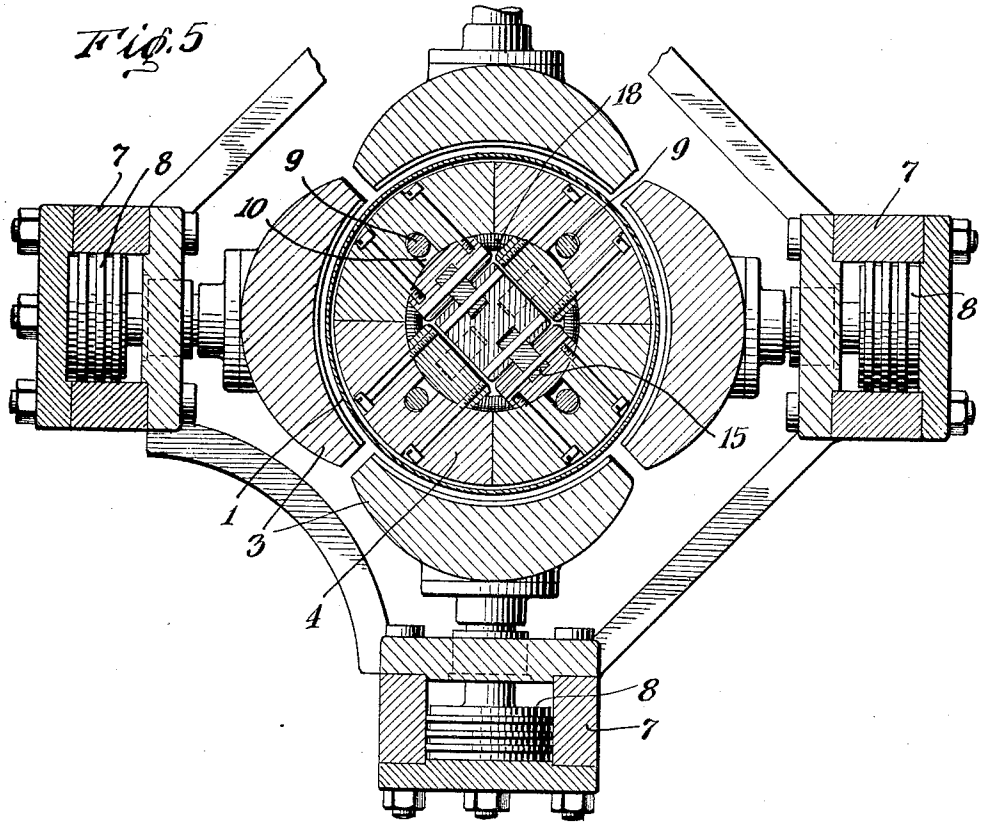
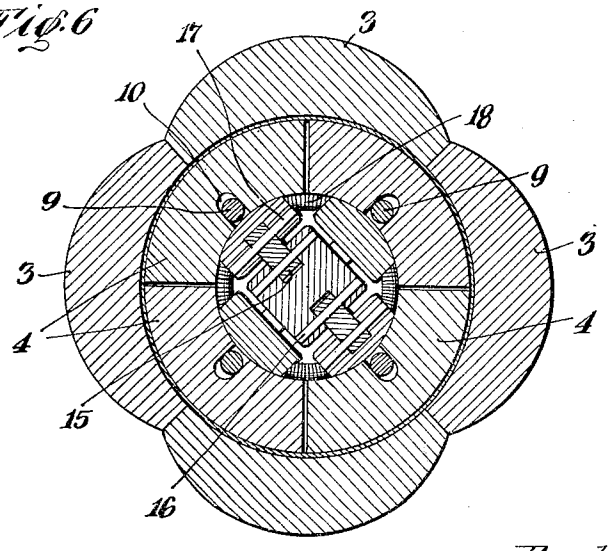


Fig. 6



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UNITED STATES PATENT OFFICE

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SHAPING AND FLANGING MACHINE

Application filed December 26, 1930. Serial No. 504,984.

This invention relates to machines for shaping and flanging bodies of sheet material, and has for its main object and feature the provision of means of a simple and reliable character for effecting said operation.

In the accompanying drawings the invention is disclosed in a concrete and preferred form in which

Fig. 1 is a plan view of a device embodying the invention;

Fig. 2 is a vertical sectional view substantially on the plane of line 2—2 of Fig. 1, with the jaws shown in open position;

Fig. 3 is a view similar to Fig. 2, with the jaws shown in closed position but before flanging takes place;

Fig. 4 is an enlarged view of parts of Fig. 3 showing the final step of flanging the body of sheet material;

Fig. 5 is a horizontal sectional view substantially on the plane of line 5—5 of Fig. 2; and

Fig. 6 is a sectional view similar to Fig. 5, substantially on the plane of line 6—6 of Fig. 3.

The body 1 of sheet material is supported on its end by supporting means 2 when introduced between contractible outer jaws 3 and expansible inner jaws 4, and it will be understood that by bringing said jaws toward each other the body will be shaped, in this instance corrugated. Also that by moving the supporting means outwardly, ledge 5 will, as indicated in Fig. 4, flange the supported end of the body, as indicated at 6.

The outer jaws are generally segmental-shape, and grouped around them is a plurality of cylinders 7, suitably supported in the framework, each of which cylinders is provided with a fluid-actuated piston 8 that carries an outer jaw. By introducing fluid pressure in one side or the other of a piston, it will be seen that the jaw carried by it will be moved by direct thrust of said piston.

The inner jaws are slidably mounted on uprights or posts 9 carried by the framework and have elongated slots 10 admitting of outward and inward movement of said jaws with respect to said posts. It will be seen that supporting members 2 are located at the lower end of the inner jaws, and that said members 2 are likewise provided with slots 11 that permit them to be moved with respect to posts 9. It will be seen, however, that supporting members 2 are articulated independently of the inner jaws, and that, in the construction here shown, the supporting members slide on the framework and that the lower ends of the inner jaws slide on the supporting members. 12 indicates a cylinder disposed axially of the body to be shaped or centrally of the machine, and this cylinder contains a piston 13, the shaft 14 of which latter extends up inside the inner jaws. Connecting said shaft and the inner jaws are links 15, each of which is pivotally supported at 16 and 17 on the shaft and an inner jaw respectively. It will now be understood that movement of piston 13 and shaft 14 in response to fluid pressure in one direction will move the inner jaws outwardly and that, upon fluid pressure being exerted in a reverse direction, the inner jaws will move inwardly. It will further be seen that the link connection between the piston shaft and an inner jaw virtually constitutes a toggle, the thrust of which is powerful. Springs as 18 may be employed to assist in retracting the inner jaws and the supporting members. Carried by piston shaft 14 is a cam 19 or a taper surface that coacts with a surface 20 on the supporting means so that, upon engagement of said surfaces, said supporting means, which are in segmental pieces like the inner jaws, will move outwardly. Cylinders 7 and 12 are each provided with two pipes for the admission and exhaust of fluid pressure, said pipes being indicated at 21 and 22.

A body 1 of sheet material is placed in position on the supporting means, and fluid pressure is admitted to all the cylinders 7 and 12, by means of one or more suitable control valves, through pipes 21, fluid on the other side of the pistons being exhausted through 22. The effect of this is to move the inner and outer jaws toward each other to corrugate the body, the continued movement of piston shaft 14, thereafter, acting to move the supporting means to thereafter flange the body and to move the inner and outer jaws

still closer together. The flow of fluid pressure is now reversed and fluid is introduced through pipes 22 and exhausted through 21 thereby reversing the movement and releasing the body.

I claim:

1. In a machine of the character set forth, means to support a body of sheet material on its end, contractible outer jaws and expansible inner jaws to shape the body while so supported, and actuating means operating to expand the inner jaws and thereafter to move the supporting means to flange the supported end of the body by bending it over the outer jaws.

2. In a machine of the character set forth, means to support a body of sheet material on its end, contractible outer jaws and expansible inner jaws to shape the body while so supported, toggles to expand the inner jaws, and cam means to move the supporting means to flange the supported end of the body by bending it over the outer jaws.

3. In a machine of the character set forth, means to support a body of sheet material on its end, contractible outer jaws and expansible inner jaws to shape the body while so supported, toggles to expand the inner jaws, cam means to move the supporting means to flange the supported end of the body by bending it over the outer jaws, and a reciprocatory member to actuate the toggles and the cam means.

4. In a machine of the character set forth, a plurality of inner and a plurality of outer jaws movable toward and away from each other to shape a body of sheet material, a plurality of cylinders and fluid-actuated pistons grouped around the outer jaws to move said jaws by direct thrust of the pistons, a cylinder and fluid-actuated piston arranged axially of the supported body to move all of the inner jaws, and links connecting the piston and inner jaws.

5. In a machine of the character set forth, a plurality of inner and a plurality of outer jaws movable toward and away from each other to shape a body of sheet material, means to support the body on its end while it is being shaped, and means to move the supporting means to flange the supported end of the body.

6. In a machine of the character set forth, a plurality of inner and a plurality of outer jaws movable toward and away from each other to shape a body of sheet material, a plurality of cylinders and fluid-actuated pistons one cylinder and piston for each outer jaw, a cylinder and fluid-actuated piston to move all of the inner jaws, means to support the end of the body while it is being shaped, and means actuated by the piston that moves the inner jaws to move the supporting means to flange the supported end of the body.

7. In a machine of the character set forth, a plurality of inner and a plurality of outer jaws movable toward and away from each other to shape a body of sheet material, a plurality of cylinders and fluid-actuated pistons grouped around the outer jaws to move said jaws by direct thrust of the pistons, a cylinder and fluid-actuated piston arranged axially of the supported body to move all of the inner jaws, means to support the end of the body while it is being shaped, and means actuated by the piston that moves the inner jaws to move the supporting means to flange the supported end of the body.

8. In a machine of the character set forth, a plurality of inner and a plurality of outer jaws movable toward and away from each other to shape a body of sheet material, a plurality of cylinders and fluid-actuated pistons grouped around the outer jaws to move said jaws by direct thrust of the pistons, a cylinder and fluid-actuated piston arranged axially of the supported body to move all of the inner jaws, links connecting the piston and inner jaws, means to support the end of the body while it is being shaped, and means actuated by the piston that moves the inner jaws to move the supporting means to flange the supported end of the body.

Signed at New York, in the county of New York, and State of New York, this 23rd day of December, 1930.

PAUL H. LANGE.