(No Model.)

C. G. BARTH & W. L. CLARK.

FLANGING MACHINE.

No. 459,345. Patented Sept. 8, 1891.

FIG. 1.

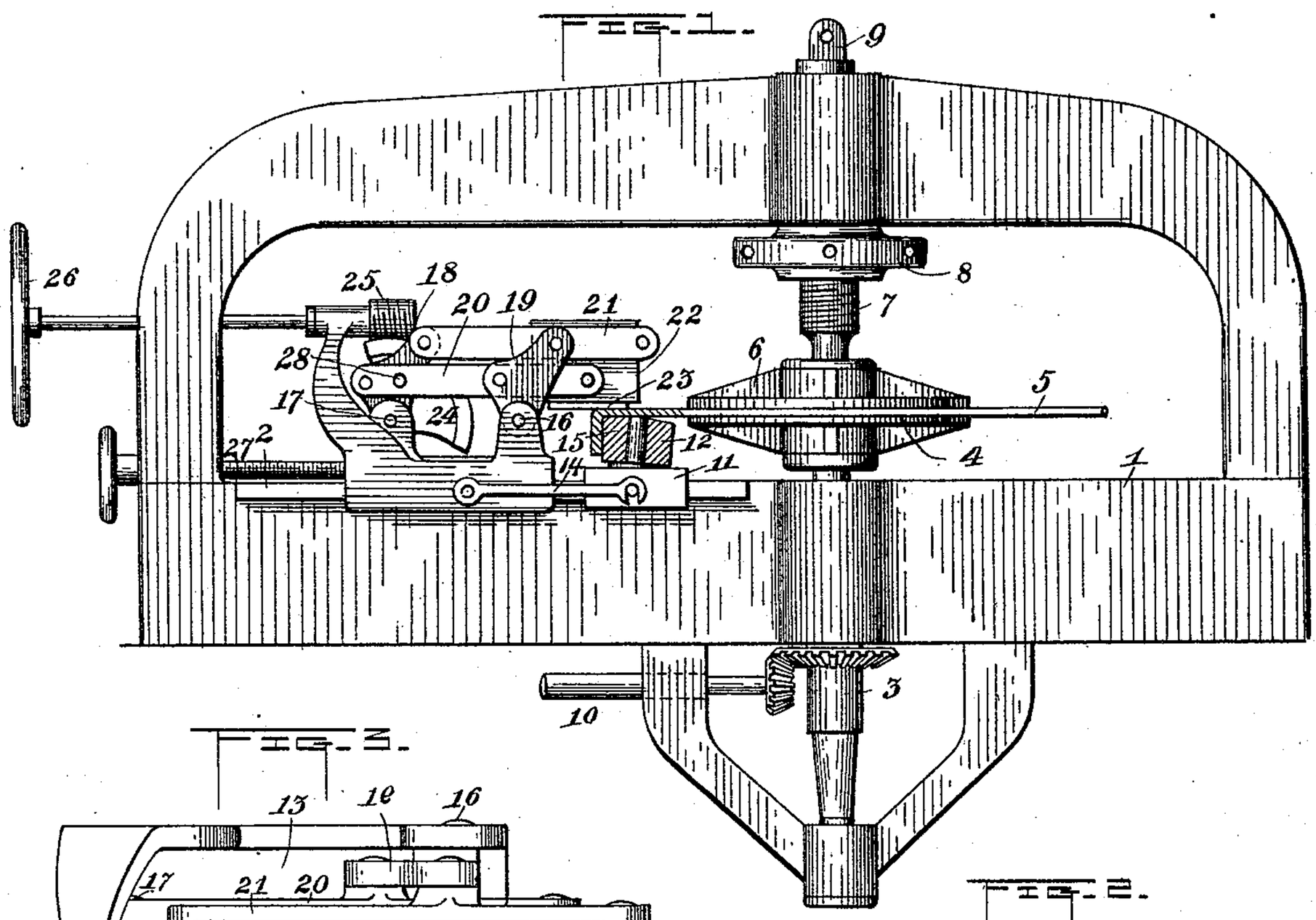


FIG. 3.

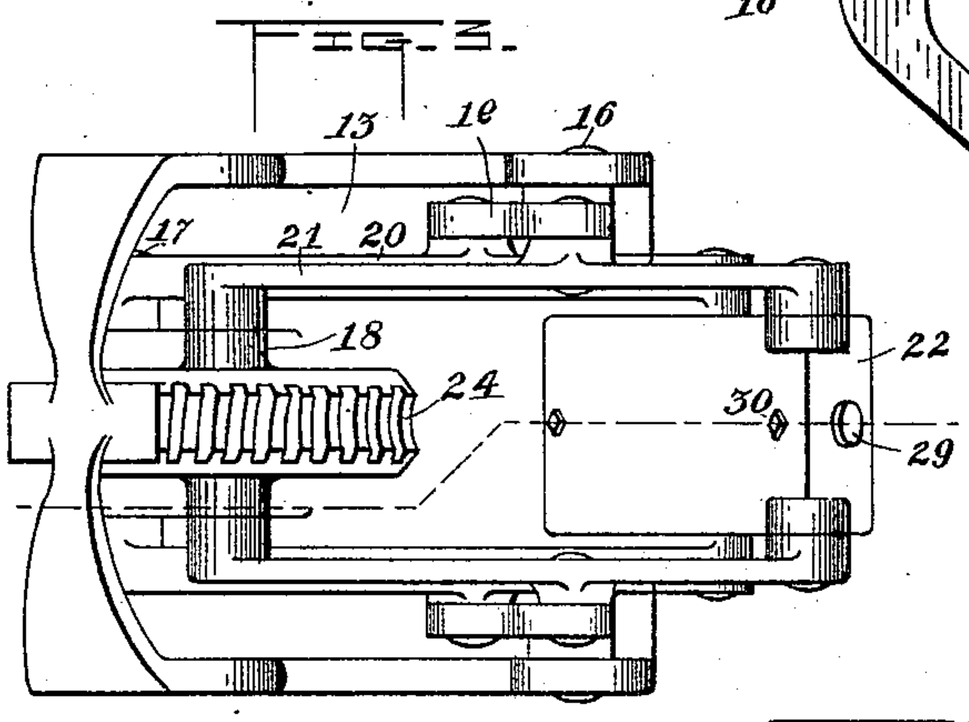


FIG. 2.

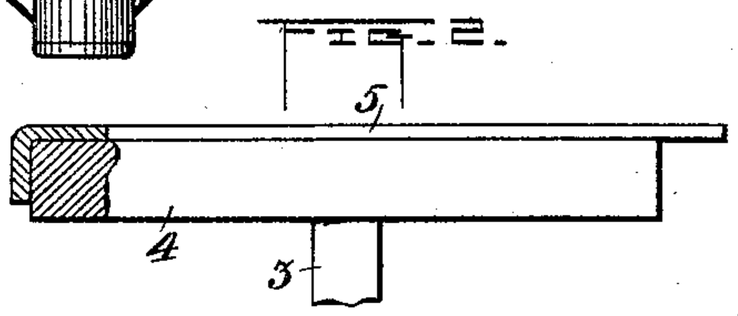
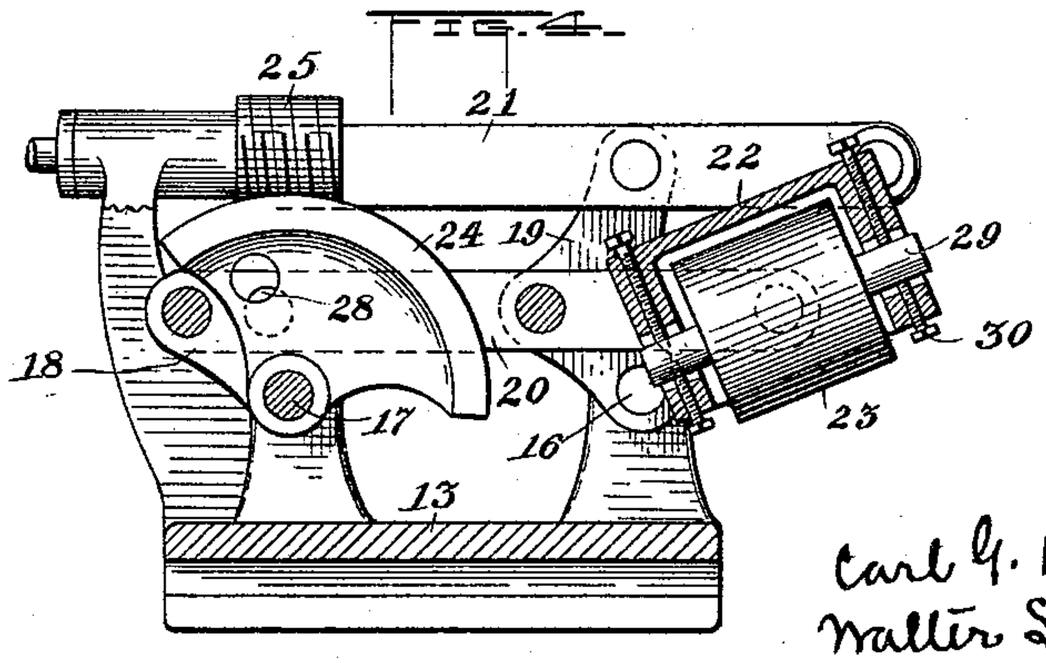


FIG. 4.



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FLANGING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 459,345, dated September 8, 1891.

Application filed June 4, 1891. Serial No. 395,121. (No model.)

To all whom it may concern:

Be it known that we, CARL G. BARTH and WALTER L. CLARK, of Philadelphia, Philadelphia county, Pennsylvania, have invented certain new and useful Improvements in Flanging-Machines, of which the following is a specification.

This invention pertains to improvements in flanging-machines designed for use by boiler-makers and other sheet-metal workers. There is a class of flanging-machines in which the plate to be flanged is revolved upon an axis at right angles to its surface, with its edge projecting over an anvil-roller, or, as an equivalent, over the edge of a rotating former-table, a spinning-roller acting on the projecting edge of the metal and, as the roller shifts its position, flanging the projected metal over the anvil-roller or former-table.

Our invention relates to improvements in the general system for supporting and moving the spinning-roller to produce the proper folding of the metal over the anvil element.

Our improvements will be readily understood from the following description, taken in connection with the accompanying drawings, in which—

Figure 1 is a front elevation of a flanging-machine exemplifying our improvements, the anvil-roller and the plate thereat appearing in vertical section; Fig. 2, a front elevation of table and plate, part vertical section, illustrating the table as serving also as the anvil element when a separate anvil-roller is not employed; Fig. 3, a plan of the mechanism which supports and moves the spinning-roller, and Fig. 4 a vertical longitudinal section of that mechanism.

In the drawings, 1 indicates the bed-plate of the machine; 2, a slideway thereon; 3, a vertical spindle journaled in the bed-plate and projecting above the same and adapted to be rotated by power through any suitable driving mechanism; 4, a disk-like table secured upon the upper end of the spindle and adapted to support and rotate the plate to be flanged; 5, the plate to be flanged, resting concentrically upon the table; 6, a pressure-plate on top of the plate to be flanged, clamping the plate to the table, so as to insure that the plate will turn with the table; 7, a pressure-screw over the axis of the pressure-plate, the pressure-plate being hung upon a journal at the lower end of this screw; 8, a capstan-nut on the pressure-screw abutting against the frame-arch of the machine and serving as a means for exerting the necessary downward pressure on the pressure-plate; 9, an eye in the upper end of the pressure-screw, by means of which the counterbalancing-rig may be attached to lift the screw and pressure-plate when the pressure at the nut is taken off; 10, an exemplifying-shaft through which motion may, if desired, be communicated to the spindle 3 by means of ordinary bevel-gearing; 11, a saddle sliding on the slideway 2 radial to the axis of the table, this saddle being hereinafter denominated the "anvil-saddle;" 12, the anvil-roller journaled on a stud projecting upwardly from the anvil-saddle, the top of this roller being level with the top of the table and the upper peripheral corner of the roller having a segmental contour of such radius as is desired for the inner corner of the flanging to be produced; 13, a main saddle sliding on the slideway outwardly beyond the anvil-saddle; 14, hook-links connecting the two saddles; 15, the center of the contour curve at the corner of the anvil-roller at that point immediately under where the root of the flange is to turn; 16, an axis carried by the main saddle at right angles to the slideway or tangent to a circle whose center is at the axis of the table, this axis 16 being at the same level as the root-corner 15 of the anvil-roller; 17, a second axis or axle carried by the main saddle parallel with axle 16, but outwardly beyond the same, axial points 16 and 17 and radius center 15 being in a common horizontal plane; 18, a lever pivoted at axis 17 and having two pivots, one farther outward radially and farther in angular advance than the other; 19, a similar lever pivoted at axis 16 and having two pivots identical as to radius and angular advance with those of lever 18, both of these levers being in pairs as an incident to proper rigidity of construction; 20, a lever pivoted at its heel to

the inner pivot of lever 18 and pivoted at an intermediate point in its length to the inner pivot of lever 19 and projecting toward the table to a pivot located in the same plane as its other two pivots; 21, a similar identical lever pivoted to the outer pivots of levers 18 and 19, all the corresponding pivot distances of these two levers 20 and 21 being accurately identical; 22, a box-like housing having two pairs of trunnion-pivots engaged by the forward ends of levers 20 and 21; 23, the spinning-roller journaled in this housing, the axis of this roller, no matter what its position of movement, being at right angles to the pivot-axis of the lever system just described; 24, a worm-wheel segment fast with lever 18, being either formed with that lever or fast on the same pivot-shaft with it; 25, a worm engaging this segment; 26, a hand-wheel on the shaft of this worm, the shaft being journaled in a bearing carried by the main saddle; 27, a screw journaled in the bed-plate and adapted to serve in adjusting the main saddle on the bed-plate; 28, holes through lever 20 and lever 18, these holes coinciding when the parts are in a certain position of movement; 29, the shaft on which the spinning-roller is journaled, the roller being in the exemplification loose on the shaft, while the shaft is clamped in the housing 22; and 30, screws in the housing for adjusting this shaft to and from the anvil-roller, the housing where the shaft engages it being slotted to permit of the adjusting movement of the shaft.

In Fig. 1 it is seen that the axis of the spinning-roller is horizontal, the lower periphery of the roller bearing on the plate 5 just over the anvil-roller. If worm 25 be turned in the proper direction, levers 18 and 19 will swing to the left simultaneously, and simultaneously the trunnion-pivots of the housing of the spinning-roller will swing to the left in arcs whose center is at radius center 15. It follows that during the course of this swinging motion the spinning-roller may have had its axis turned from the horizontal to the vertical position, and that during the entire movement the lower surface of the spinning-roller will have remained constantly tangent to a circle struck from radius center 15. This circle will be the outer contour circle of the completed flanging. It will be observed that the effect of the action is, as plate 5 is forcibly rotated, that the spinning-roller folds the projecting metal of the plate down over the anvil-roller with a truly circular wiping motion. The anvil-roller is to be adjusted along the slideway to have a proper radial position with reference to the center of the table, this adjustment being effected in the exemplification by screw 27, which moves both saddles together. The anvil-roller and its saddle may of course be dispensed with in case the flanging is done, as is quite common, over a former-table of proper diameter and stiffness, such former-table being illustrated in Fig. 2.

By unhooking links 14 the main saddle and all the spinning-roller mechanism may be moved back far away from the table to permit the removal or placing of the plate being operated upon. Where the anvil-roller is employed, the plate to be operated upon may be placed on the table, while the main or both saddles are out of the way to the left, and the saddles may then be moved to the right to the proper position, after which the table may be put in motion and the flanging effected. When the flanging is done, the links 14 may be unhooked and the main saddle, &c., moved to the left, permitting the work to be removed. The anvil, saddle, and roller, however, need never be moved, except for purposes of primary adjustment to suit the radius of work in hand. In other words, the operation of the machine, aside from adjustment for radius of plate being worked on, does not require that the anvil-roller shall be capable of being shifted. Where a former-table such as is illustrated in Fig. 2 is employed, changeable or alternative tables of proper diameter take the place of the shifting anvil-roller.

Screws 30 permit the adjustment of the spinning-roller to suit different thicknesses of iron being operated upon. It may be desirable to sometimes freely lift the spinning-roller away from the plate, or, in other words, to open the upper jaw of the system. Holes 28 coincide at a certain position of the system. By removing pivots 16 and putting a pin through holes 28 the entire lever system has become rigidly unified and deprived of all but a single axis of motion—namely, that at 17. Under such conditions if worm 25 be turned in the proper direction the rigid lever system will swing upwardly on pivot 17, and the upper jaw of the system may thus be boldly opened.

We have in the preceding description spoken of lever 18, lever 19, &c. All these levers are in pairs arranged to straddle the central parts, as will be understood from Fig. 3. This is merely a structural feature incident to a desire to secure great stiffness in the parts without excessive bulk and weight. The worm and worm-wheel are to be taken as a mere exemplification of means for forcibly moving the lever system.

We claim as our invention—

1. In a flanging-machine, the combination, substantially as set forth, with devices to support and rotate the plate to be flanged, and a form-corner over which the flange is to be turned, of two pivots in the same plane with said form-corner, an oscillating lever mounted on each of said pivots, two parallel levers pivoted on said first-mentioned levers, a housing pivoted to said parallel levers, a spinning-roller journaled in said housing, and means for oscillating said oscillating levers.

2. In a flanging-machine, the combination, substantially as set forth, with devices to support and rotate the plate, a form-corner

over which the flange is to be turned, and a spinning-roller to turn the flange, of two parallel levers, each having three pivots in a common line, a housing pivoted to one pivot of each of said levers and carrying said roller, two oscillating levers connected with said parallel levers, two pivots located in the plane of said form-corner and supporting said oscillating levers, and means for oscillating said oscillating levers.

3. In a flanging-machine, the combination, substantially as set forth, with devices to carry a plate, a form-corner over which the flange is to be turned, and a spinning-roller, of a housing for the spinning-roller, a pair of parallel levers trunnioned at each side of said housing, two oscillating levers pivoted to each pair of said parallel levers and supported on pivots of oscillation, and means for oscillating said oscillating levers.

4. In a flanging-machine, the combination, substantially as set forth, with devices to carry the plate, a form-corner over which the flange is to be turned, and a spinning-roller, of a housing, levers pivoted to the housing, a shaft for the spinning-roller carried by the housing, and screws for adjusting said shaft in said housing.

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