No. 631,585. Patented Aug. 22, 1899.

A. J. RUDOLPH.

MACHINE FOR FORMING BOTTLE NECKS.

(Application filed Jan. 11, 1899.)

(No Model.) 2 Sheets—Sheet 1.

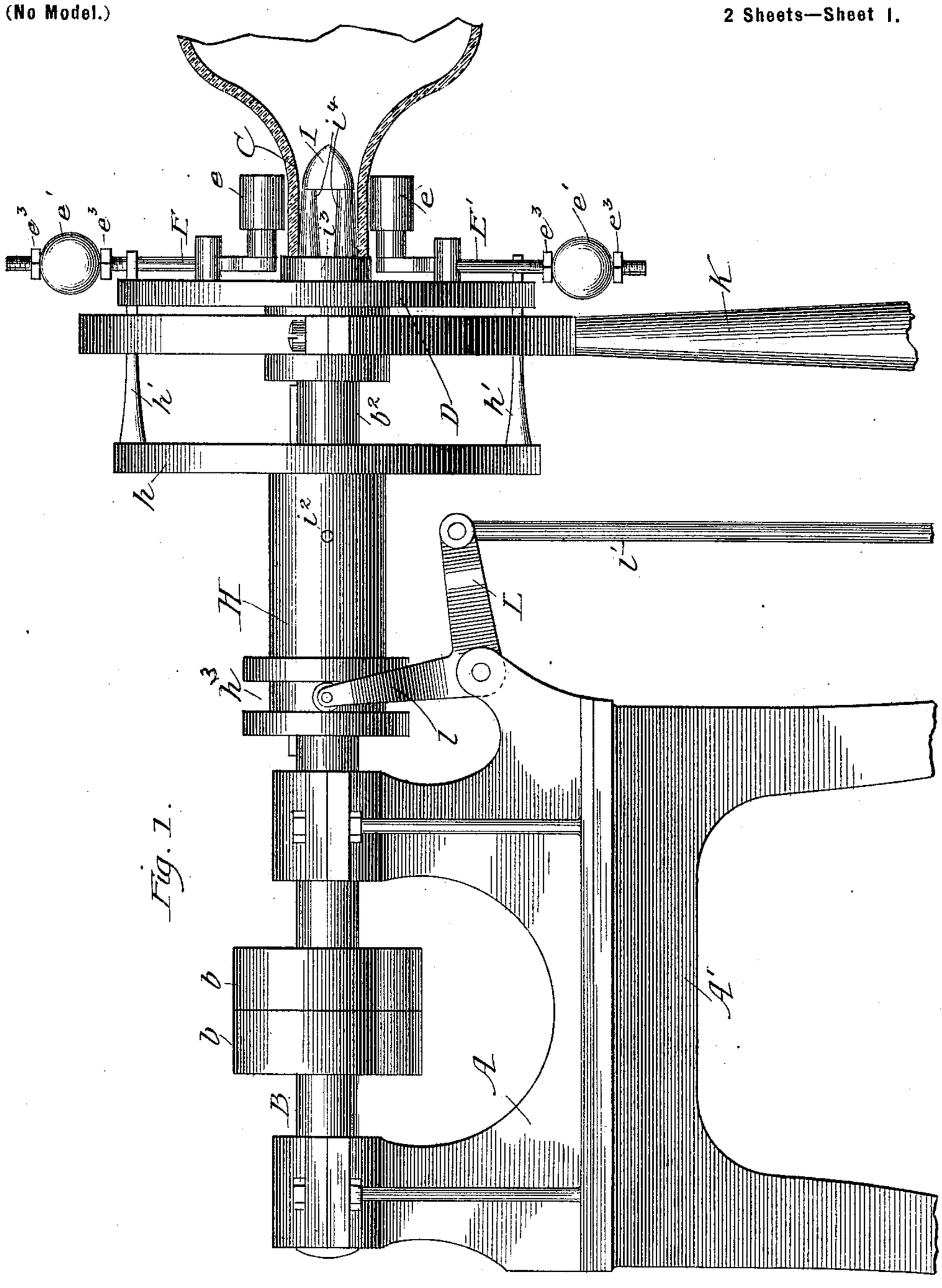

Fig. 1.

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(No Model.) 2 Sheets—Sheet 2.

Fig. 3.

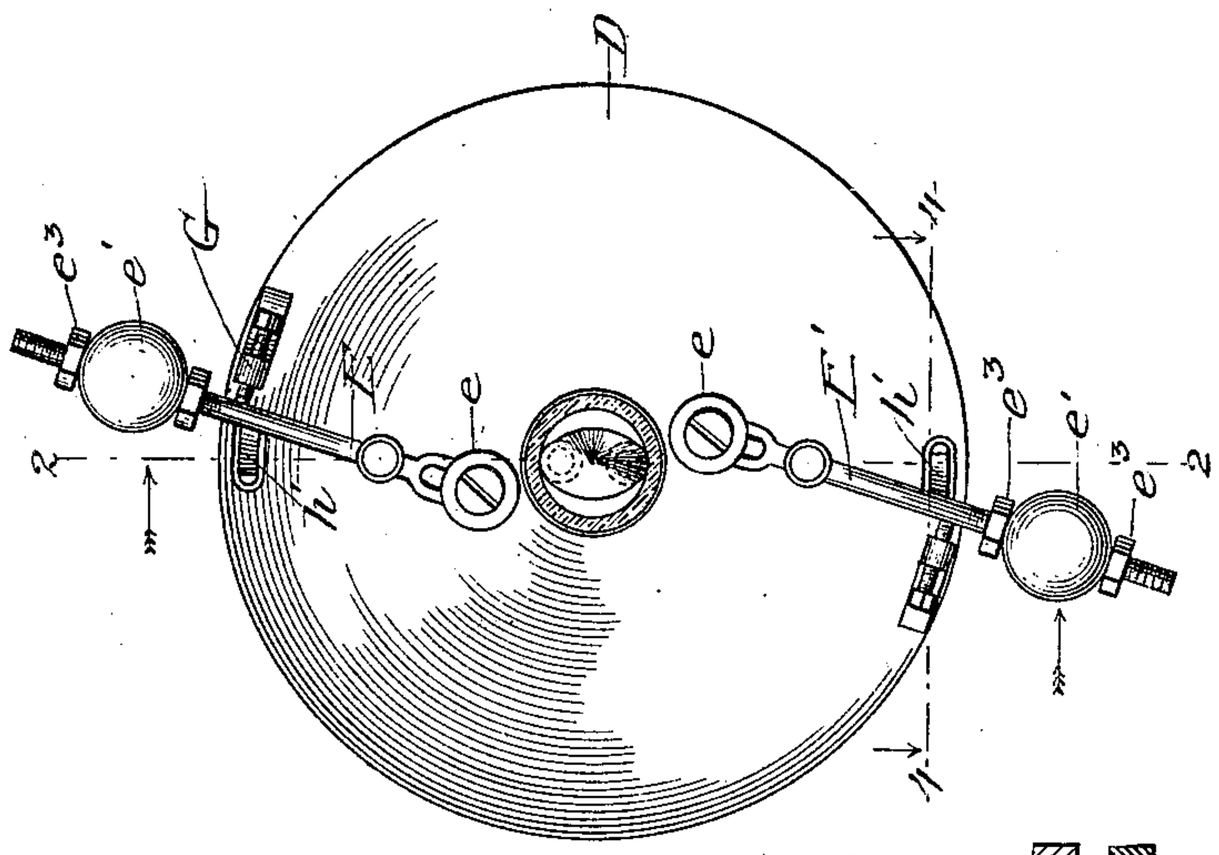

Fig. 4.

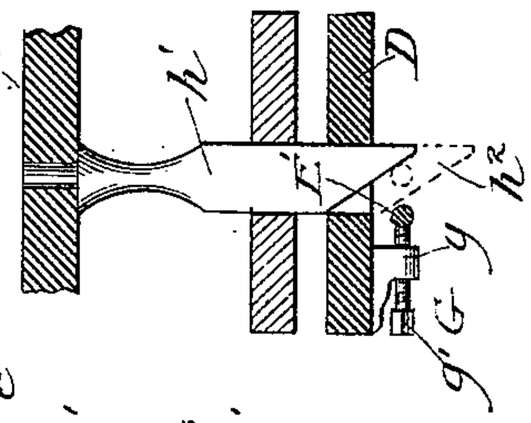

Fig. 2.

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UNITED STATES PATENT OFFICE.

ALEXANDER J. RUDOLPH, OF CHICAGO, ILLINOIS.

MACHINE FOR FORMING BOTTLE-NECKS.

SPECIFICATION forming part of Letters Patent No. 631,585, dated August 22, 1899.

Application filed January 11, 1899. Serial No. 701,833. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER J. RUDOLPH, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Machines for Forming Bottle-Necks, of which the following is a specification.

The invention relates to that class of machines which are provided with mechanism adapted to contact the neck of a bottle while it is in a heated or ductile condition and size and shape the exterior and interior surfaces of the same.

The object of the invention is to provide a simple, economical, and efficient machine for sizing and forming or shaping bottle-necks; and the invention consists in the features, combinations, and details of construction hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a side elevation of one form of machine constructed in accordance with my improvements; Fig. 2, a sectional elevation of a portion of the machine, taken on the line 2 of Fig. 3, looking in the direction of the arrow; Fig. 3, a front elevation of a portion of the mechanism shown in Fig. 2; and Fig. 4, a sectional view of a portion of the mechanism, taken on the line 4 of Fig. 3, looking in the direction of the arrow.

In constructing a machine in accordance with my improvements I use a head-stock A of the desired size, shape, and strength to hold the operative and other mechanisms in position for use, and which may be mounted upon a bench or standard A′. In this head-stock is mounted a rotatable mandrel or spindle B, provided with tight and loose pulleys *b* and *b*′ for the purpose of transmitting power and motion to the rotatable mandrel.

For the purpose of sizing and forming the neck of a bottle C a disk or similar element D is provided and mounted upon the tubular extension b^2 of the rotatable mandrel, so as to rotate therewith. Upon this disk are two centrifugal levers E and E′, pivotally secured thereto, so as to oscillate in a plane coincident therewith, and carrying at their inner ends forming-rolls *e*, which are rotatably mounted thereon and which when brought into contact with the bottle-neck give unto the exterior surface thereof the desired size and shape. The outer ends of these centrifugal levers are provided with weights *e*′, adjustably secured thereto by means of a set of lock-nuts e^3, the whole being so constructed and arranged that as the disk is rotated the weights are by centrifugal force vibrated outwardly to oscillate the lever and carry the forming rolls inwardly into contact with the bottle-neck. In order to limit the movements of these centrifugal levers, stop mechanism G is provided, which consists of brackets *g* and set-screws *g*′, adapted to be contacted by the centrifugal levers and limit the position thereof and also provide for the requisite size of the bottle-neck.

To assist in forcing and holding the centrifugal levers against the stop mechanism an operating-sleeve H is provided, which has a shoulder or similar element *h*, secured thereto, provided with two cam-shaped projecting rods *h*′, which extend out from the face thereof, so that as the operating-sleeve is moved forwardly the cam-surfaces h^2 of these projecting rods contact the centrifugal levers and force them over and hold them against the stop mechanism, thus assisting in the operation of the forming-rolls, so as to size and shape the exterior of the bottle-neck. The backward movement of the operating-sleeve during the non-rotation of the rotatable mandrel permits the centrifugal levers to be operated, so as to withdraw the rolls from the bottle-neck.

To shape the interior of the bottle-neck and assist in the forming of the lip thereof, a forming-plug I is provided, having a cylindrical portion *i* inserted in the axial opening of the tubular extension of the rotatable mandrel and which is provided with an elongated slot *i*′ in one portion thereof, through which a pin i^2 is passed, said pin being inserted in the operating-sleeve, so that as the operating-sleeve approaches the forward limit of its motion it pushes the forming-plug forwardly, so that its shoulder i^3 may contact the bottle-lip and curl up the same, so that it can be operated upon by the forming-rolls. The forming-plug is preferably provided with two longitudinal rolls i^4, adapted to contact the interior of the bottle-neck and size and shape the same.

To assist in holding the parts in the desired position, a standard K is provided, in which is rotatably mounted a supporting-disk *k*, having perforations through which the cam projections *h'* are passed.

To move the operating-sleeve backwardly and forwardly, a bell-crank lever L is provided, which has a yoke portion *l*, engaging with an annular groove h^3 in the operating-sleeve. A connecting-rod *l'* is provided, which may be secured to a treadle or similar element (not shown) for the purpose of moving the bell-crank lever.

I claim—

1. In a machine of the class described, the combination of a rotatable mandrel, a disk or similar element mounted thereon so as to rotate therewith, and forming-roll mechanism pivotally mounted on the disk and arranged to be operated toward or from the center of the disk by centrifugal force and size and shape the interior of the bottle-neck, substantially as described.

2. In mechanisms of the class described, the combination of a rotatable mandrel, a disk or similar element mounted thereon so as to be rotated thereby, lever mechanism pivotally secured to the disk so as to oscillate in a plane coincident with the plane of rotation of the disk and provided with forming-rolls arranged to be moved toward or from the center by centrifugal force when the disk is rotated, substantially as described.

3. In a machine of the class described, the combination of a rotatable mandrel, a disk or similar element mounted thereon so as to be rotated thereby, two levers pivotally secured to the face of the disk so as to oscillate in a plane coincident with the plane of rotation of the disk, a forming-roll secured to the inner end of each lever, and a weight secured at or near the outer end of each lever and arranged so as to operate the forming-rolls by centrifugal force when the disk is rotated, substantially as described.

4. In a machine of the class described, the combination of a rotatable mandrel, a disk or similar element mounted thereon so as to be rotated thereby, two levers pivotally secured to the face of the disk so as to oscillate in a plane coincident with the plane of rotation of the disk, forming-rolls secured to the inner end of each lever, a weight secured at or near the outer end of each lever and arranged so as to operate the forming-rolls by centrifugal force when the disk is rotated, and stop mechanism to limit the movement of the pivotal levers in one direction, substantially as described.

5. In a machine of the class described, the combination of a rotatable mandrel, a disk or similar element mounted upon the mandrel so as to be rotated thereby, a lever or levers pivotally secured to the face of the disk so as to oscillate in a plane coincident with the rotation thereof, a forming-roll on the inner end of each lever, a weight on the outer end of each lever, stop mechanism to limit the movement of the levers in one direction, and means for forcing and holding the levers in engagement with the stop mechanism, substantially as described.

6. In a machine of the class described, the combination of a rotatable mandrel, a disk or similar element mounted upon the mandrel so as to be rotated thereby, a lever or levers pivotally secured to the face of the disk so as to oscillate in a plane coincident with the rotation thereof, a forming-roll on the inner end of each lever, a weight on the outer end of each lever, stop mechanism to limit the movement of the levers in one direction, an operating-sleeve provided with forwardly-projecting pins *h'* arranged to contact the pivoted levers and force and hold the same against the stop mechanism, substantially as described.

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Witnesses:
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