No. 816,001. PATENTED MAR. 27, 1906.

J. BRENZINGER.

CAP FLANGING MACHINE.

APPLICATION FILED APR. 29, 1905.

3 SHEETS—SHEET 1.

Fig. 1a

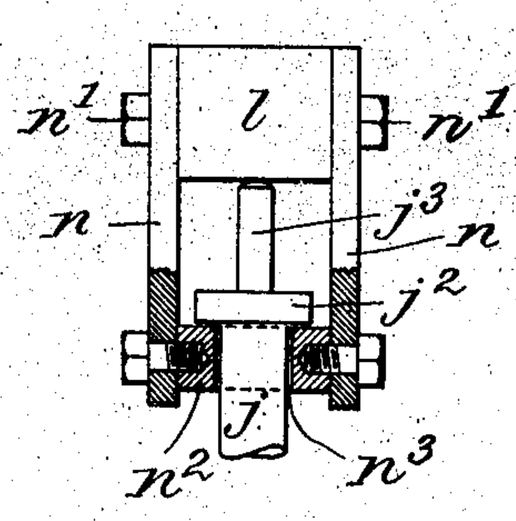
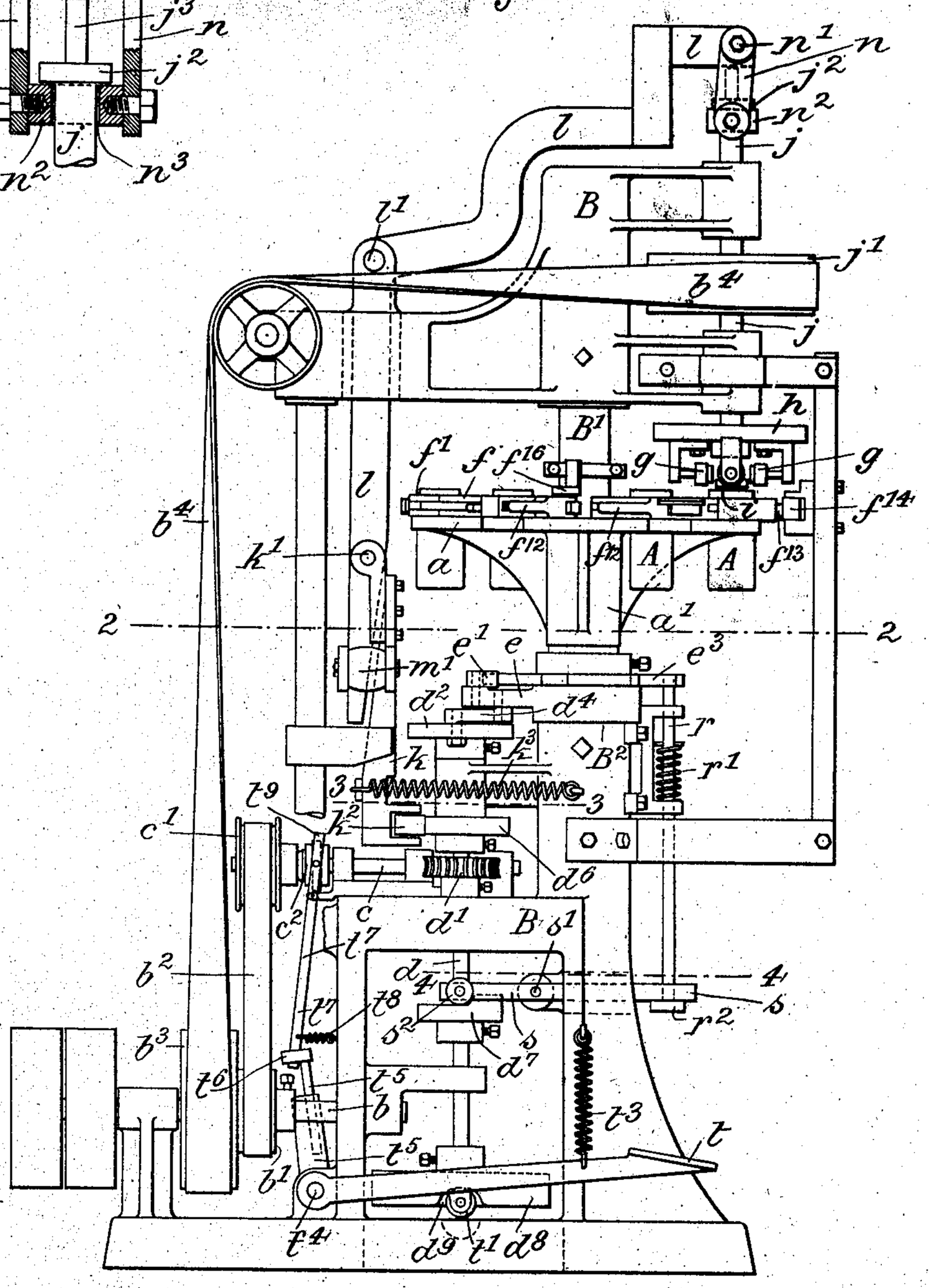


Fig. 1.



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3 SHEETS—SHEET 2.

Fig. 2.

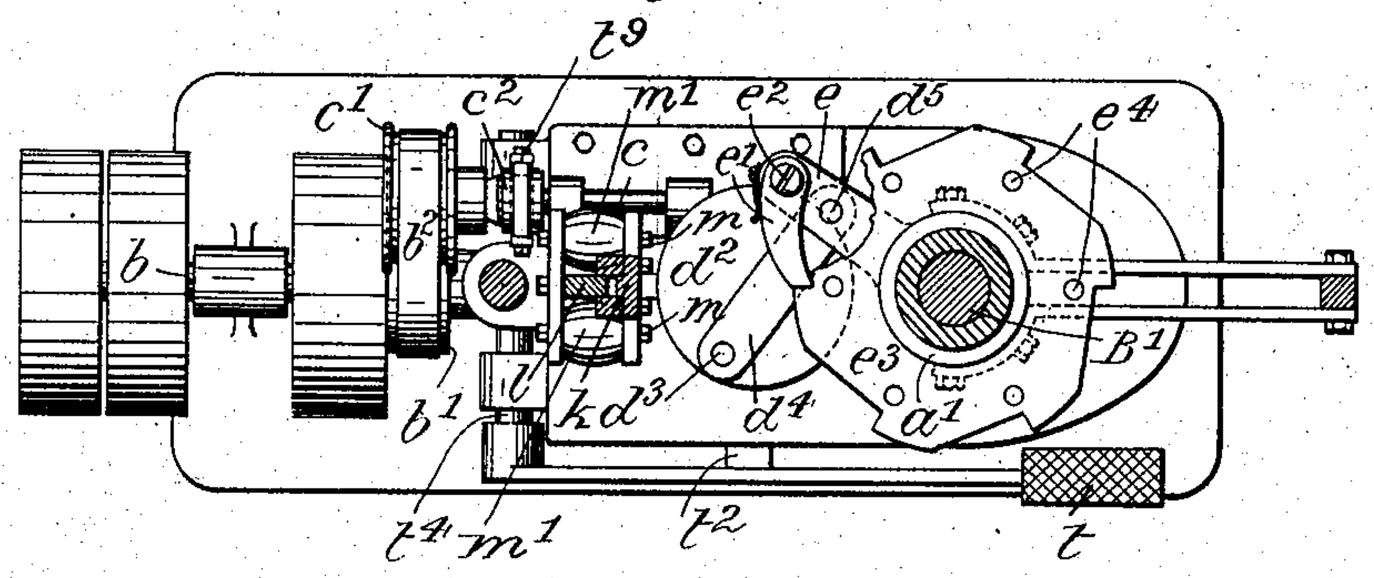
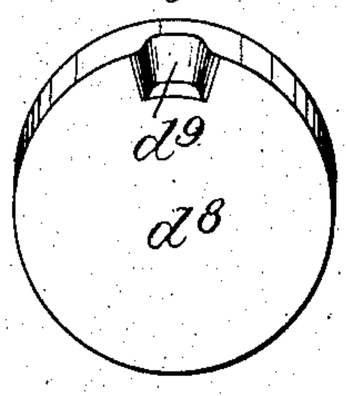


Fig. 5.



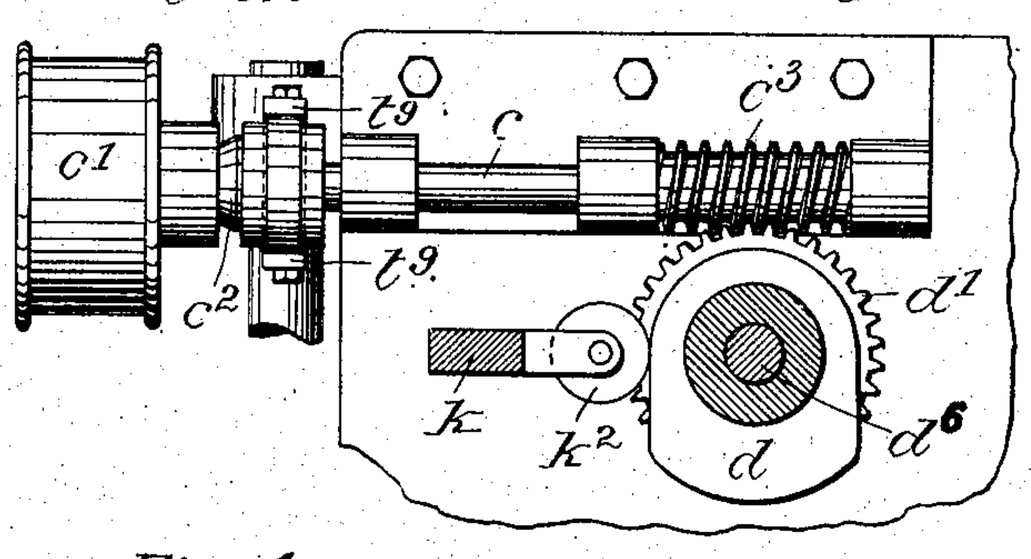


Fig. 3.

Fig. 4.

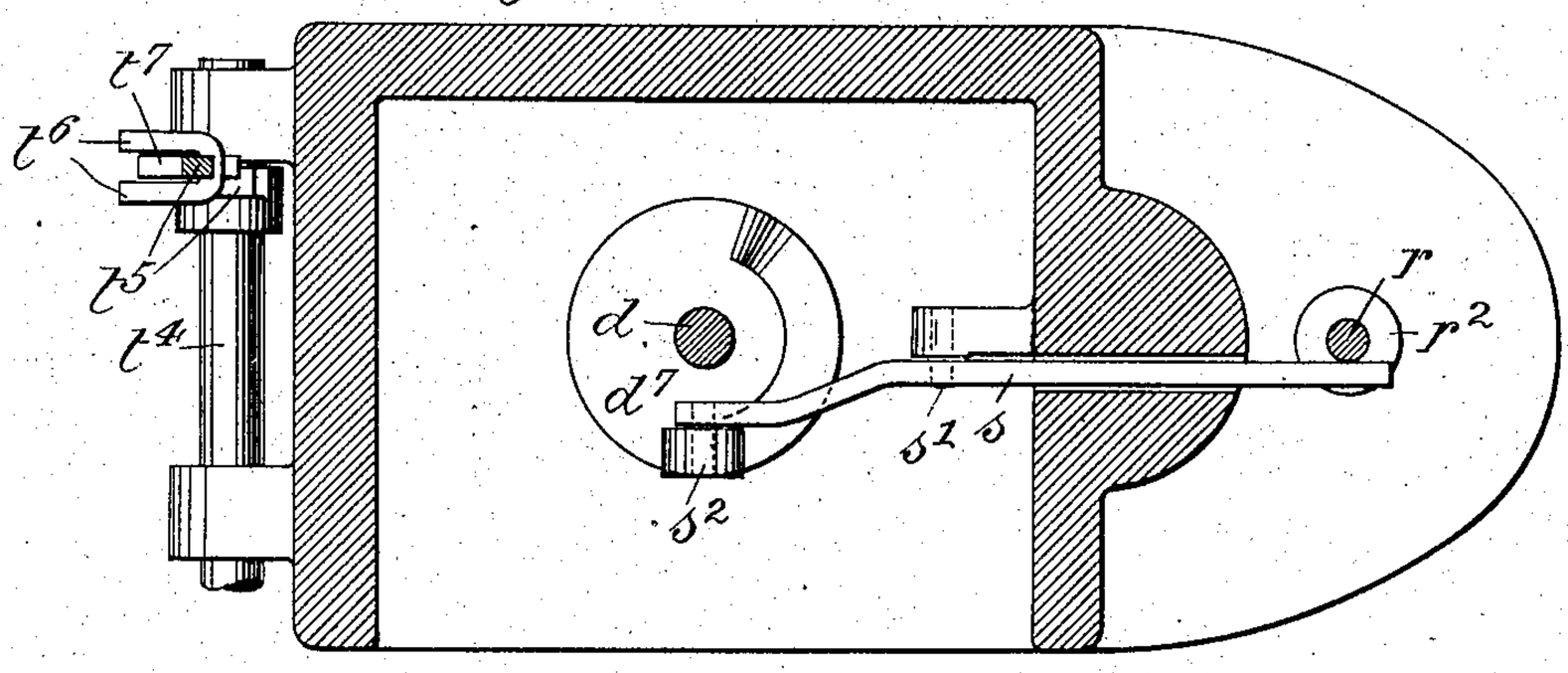


Fig. 11.

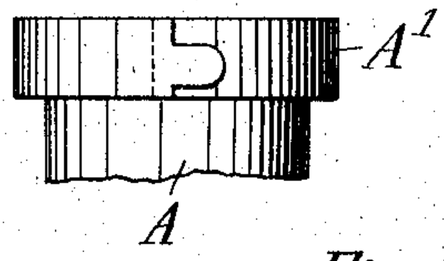


Fig. 13.

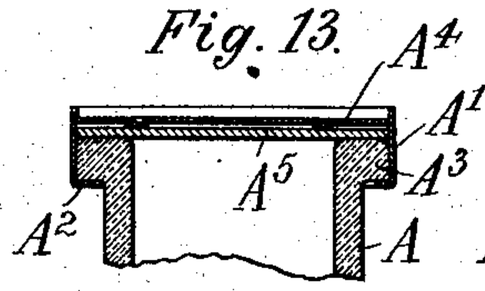


Fig. 14.

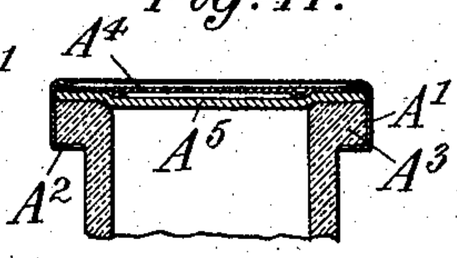
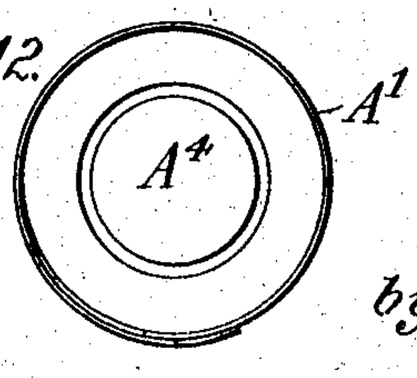


Fig. 12.



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CAP FLANGING MACHINE.

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3 SHEETS—SHEET 3.

Fig. 6.

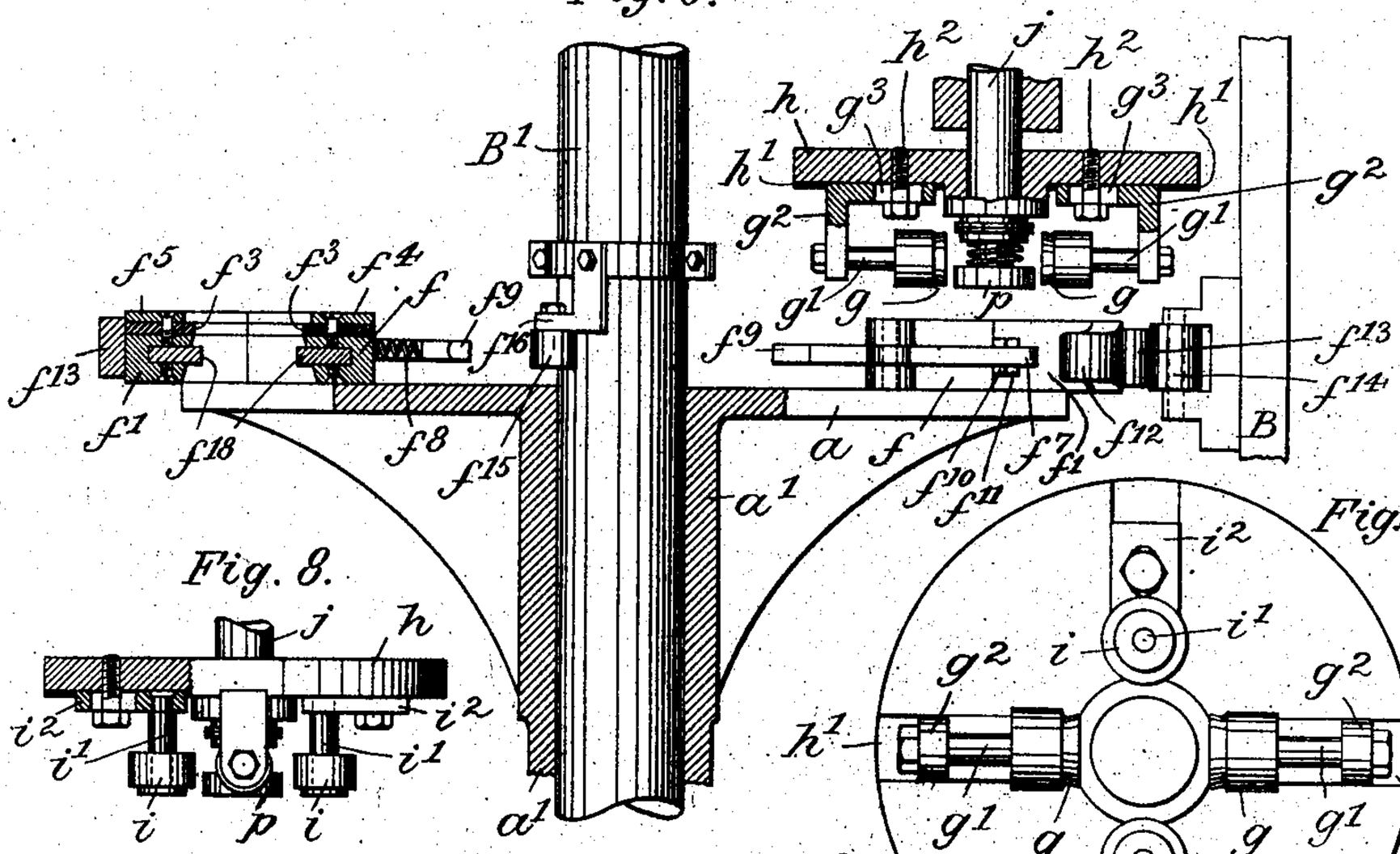

Fig. 8.

Fig. 9.

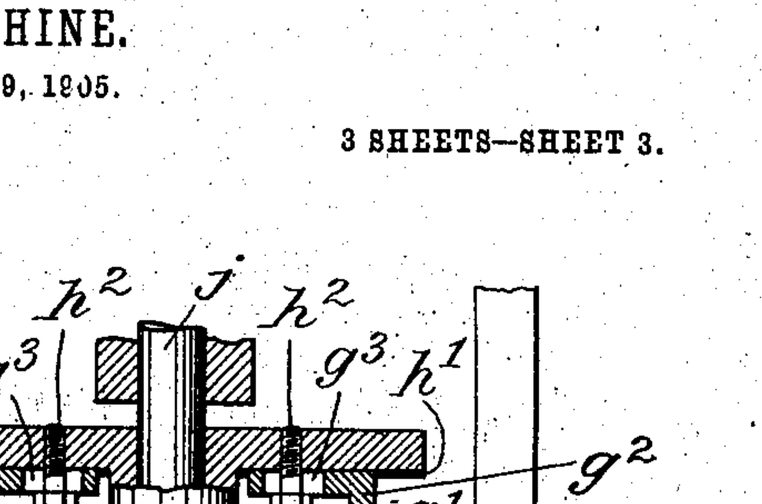

Fig. 7.

Fig. 10.

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UNITED STATES PATENT OFFICE.

JULIUS BRENZINGER, OF MOUNT VERNON, NEW YORK, ASSIGNOR TO THE MAX AMS MACHINE CO., OF MOUNT VERNON, NEW YORK, A CORPORATION OF NEW YORK.

CAP-FLANGING MACHINE.

No. 816,001. Specification of Letters Patent. Patented March 27, 1906.

Application filed April 29, 1905. Serial No. 258,036.

To all whom it may concern:

Be it known that I, JULIUS BRENZINGER, a citizen of the United States, residing at Mount Vernon, Westchester county, State of New York, have invented new and useful Improvements in Cap-Flanging Machines, of which the following is a specification.

This invention relates to a machine for attaching a cap to a bottle, jar, or other receptacle, and thereby closing the latter. The cap consists, essentially, of a resilient band having a lower flange that engages below the head of the bottle and of a disk or cover which rests upon the mouth of the same and is surrounded by the band. Thus by upsetting the upper edge of the band against the cover the two component parts of the cap are united and the bottle is closed.

The machine consists, essentially, of a table or support from which the bottles are adapted to be suspended and which presents them to a set of rotatory flanging-rollers. These rollers upon descending engage the band above referred to and upset the same against the cover to close the bottle. By suspending the bottles from the support during the flanging operation the working pressure is taken up by the comparatively heavy heads of the bottles and not by their bodies, so that breakage is avoided.

In the accompanying drawings, Figure 1 is a side elevation of my improved cap-flanging machine; Fig. 1ª, a detail of the yoke; Fig. 2, a horizontal section on line 2 2, Fig. 1; Fig. 3, an enlarged horizontal section on line 3 3, Fig. 1; Fig. 4, a similar section on line 4 4, Fig. 1; Fig. 5, a perspective view of the clutch-operating disk; Fig. 6, a vertical section, partly in elevation, of the feed-table and flanging-head; Fig. 7, a plan of the feed-table; Fig. 8, a front view, partly in section, of the flanging-head; Fig. 9, a bottom view thereof; Fig. 10, a detail of the chuck; Fig. 11, a side view of the bottle-head, showing the cap before being flanged; Fig. 12, a plan thereof; Fig. 13, a vertical section of Fig. 11; and Fig. 14, a vertical section through the head, showing the cap after being flanged.

The letter A indicates the bottle or other receptacle to be closed.

A′ is the band that embraces the mouth of the bottle, projects above the same, and has a lower flange A^2, which engages underneath the head A^3. The band A′ incloses and extends above a cover A^4 and also, if desired, a packing A^5, that is placed upon the bottle. The machine upsets the upwardly-projecting section of band A′, Fig. 13, against the cover A^4, Fig. 14, to unite the two component parts A′ A^4 of the cap, and thus seal the bottle.

B indicates the frame of the machine, having a fixed shaft or standard B′, that is embraced by the hub a' of a rotatory feed table or support a, the hub resting upon an offset B^2 of frame B. The bottles A to be closed are adapted to be suspended by their heads from table a, which presents them successively to the flanging-head hereinafter described. Means are provided for imparting an intermittent rotatory movement to the table, the relative arrangement of the parts being such that the table is at rest while the flanging-rollers act to close the bottle.

The means for imparting intermittent rotatory movement to the table a are as follows: In suitable bearings of frame B turns the driving-shaft b, which by pulley b' and belt b^2 rotates a pulley c', loose on worm-shaft c, to which it is adapted to be coupled by a clutch c^2. The worm c^3 of shaft c intergears with a worm-wheel d', fast on an upright shaft d, that also carries a crank-disk d^2. To the latter is fulcrumed at d^3 a link d^4, pivoted at d^5 to a lever e, which is loosely mounted upon hub a', Fig. 2. A spring-influenced pawl e', pivoted to lever e at e^2, is adapted to engage the teeth of a ratchet-disk e^3, clamped to hub a'. Thus each rotation of shaft d will by pawl e' advance disk e^3 for the distance of one tooth, the disk being at rest when the pawl recedes. In this way the desired intermittent rotatory movement is imparted to disk e^3, and consequently to table a.

The bottles A to be closed are suspended from table a in the following manner: The table is provided with a series of peripheral notches, the number of which corresponds to the number of teeth on disk e^3. At each notch there is mounted upon the disk the fixed member f of a clamp, to which the movable member or jaw f' is hinged at f^2. The clamp f f' when closed is adapted to embrace the neck of the bottle A, which is thus suspended therefrom by its head A^3. This head is supported upon inwardly-projecting fiber gaskets f^3, which are secured to the

clamp by top plates f^4 f^5. To member f is pivoted at f^6 a hook or catch f^7, influenced by a spring f^8 and having a tailpiece f^9. The hook f^7 is designed to engage either one of a pair of keepers f^{10} f^{11} on jaw f'. The attendant after fitting the bottle in position swings jaw f' inward by a handle f^{12}, so that the hook f^7 falls behind first keeper f^{10}. As the table a now advances a projection f^{13} on jaw f' encounters a roller f^{14}, journaled in frame B, and forces jaw f' inward to such an extent that the hook f^7 falls behind the second keeper f^{11}. In this way the clamp is tightly closed without unnecessarily taxing the strength of the attendant. After the flanging operation has been completed and the closed bottles are again carried within reach of the operator the tail f^9 encounters a roller f^{15}, journaled in an arm f^{16}, clamped to fixed shaft B'. The roller will thus open hook f^7 to disengage keeper f^{11} and permit jaw f' to be thrown open by springs f^{17}. The bottle, being thus released, will drop upon a suitable chute. (Not shown.) The members $f f'$ are of such a size that they will not press laterally against the bottle, any rotation of the latter during the flanging operation being prevented by inwardly-projecting elastic buffers f^{18}.

In Fig. 7, X' indicates the position of the clamp when partly closed around the inserted bottle. X^2 shows the clamp completely closed, the bottle being here acted upon by the flanging-rollers. At X^3 X^4 X^5 are shown successive positions to which the bottles are carried, while X^6 shows the clamp open with the bottle discharged.

The means for flanging the bottle-cap consist of a suitable number of flanging-rollers g, which are so profiled as to turn the projecting end of band A', Fig. 13, inward and against cover A^4, Fig. 14. The rollers g turn on shafts g', carried by bent hangers g^2, which are secured to a rotatable and vertically-movable flanging-head h. The hangers g^2 are adjustable in radial grooves h' of head h by means of slots g^3 and set-screws h^2, so that the flanging-rollers may be properly set. Intermediate the rollers g there may be secured to head h guide-rollers i, turning on arbors i', which are carried by the radially-adjustable slides i^2, Figs. 8 and 9. The head h is mounted upon an upright shaft j, carrying fast pulley j', that receives continuous rotatory movment from a pulley b^3 on shaft b by belt b^4. The shaft j is vertically or axially movable to first lower head h and bring rollers g into engagement with the cap and to then raise the rollers off the cap.

The means for imparting the axial movement to shaft j are as follows: Shaft d carries a cam d^6, adapted to oscillate a lever k, fulcrumed at k' to an elbow-lever l. Lever k has a roller k^2, which is drawn against cam d^6 by a spring k^3. A yielding connection is formed between the levers k l by means of pins m passing therethrough and carrying elastic buffers m', which are interposed between the levers. This yielding connection permits the rollers g to adjust themselves to slight variations in the height of the bottle-heads. To the upper arm of lever l is fulcrumed at n' a yoke n, the lower member or cross-piece n^2 of which is perforated at n^3. Through the perforated member n^2 passes the upper end of shaft j, which is provided above perforation n^3 with a collar j^2 and a pin j^3. Each complete rotation of shaft d will cause an oscillation of lever l on its fulcrum l', so that when its upper arm descends it will by bearing upon pin j^3 lower shaft j, and consequently head h and rollers g. When such upper arm rises, the shaft j will be lifted by the engagement of member n^2 with collar j^2. The machine is so timed that the engagement of the rollers g with the cap takes place while table a is at rest. The shaft j projects beneath head h, and into its lower socketed end is fitted a pin o, having head o', Fig. 10. This pin is embraced by the sleeve p' of a chuck p, which is made to bear upon cover A^4 by spring p^2. The chuck p is recessed at p^3 to receive head o', which thus holds the chuck to the pin. Interposed between spring p^2 and shaft j is a ball-race q. Upon the descent of shaft j the chuck p, which is centered between rollers g, engages cover A^4 in advance of the engagement of band A' by the rollers. The chuck will thus press the cover tightly against the bottle-head and the latter against its seat f^3 of clamp $f f'$ in advance and during the flanging operation. The ball-bearing meanwhile permits the chuck p to remain stationary through its frictional contact with cover A^4, while shaft j is free to rotate axially.

It is desirable to provide means for positively locking the table a against rotation while the flanging rotation is going on. Such means are shown to consist of a series of perforations e^4 in ratchet-disk e^3, Fig. 2, one perforation being provided for each tooth of the disk. The perforations e^4 are successively engaged by a vertically-movable bolt r, influenced by a spring r' and having a lower head r^2. Against this head bears one arm of a cam-lever s, fulcrumed at s' and carrying on its other arm a cam-roller s^2. The latter engages a cam d^7, fitted on shaft d. It will be seen that by the above-described mechanism the bolt will be alternately raised and lowered during each rotation of shaft d, so as to first lock and then release disk e^3, and consequently table a.

As has already been stated, the pawl-and-ratchet mechanism e' e^3 imparts an intermittent rotatory movement to table a. The periods of rest of the table are utilized by the attendant to suspend a new bottle from the table. It is desirable that these periods of

rest may be prolonged, if so desired, so that the operator may have his own time for securing each bottle in position. Means are therefore provided for automatically stopping the shaft d upon each complete rotation and for restarting it whenever desired. These means are shown to consist of a disk d^8, Fig. 5, carried by shaft d and having notch d^9. The latter is adapted to be engaged by a roller t', journaled to an arm t^2 of a treadle t, which is influenced by a spring t^3. Treadle t is fast on a rock-shaft t^4, carrying a lever t^5, which has a forked end t^6. The fork grasps the lower end of a shipping-lever t^7, influenced by a spring t^8 and embracing with its upper forked end t^9 the clutch c^2. By depressing treadle t clutch c^2 will couple pulley c' to worm-shaft c, and thus start the rotation of shaft d. As the shaft rotates the roller t' will ride along the solid section of disk d^8 to maintain the coupling in its closed position. When the shaft d has completed a full rotation, roller t' will by spring t^3 be drawn into notch d^9 to raise treadle t, open clutch c^2, and stop shaft d. In this way the table a will be arrested and the flanging-rollers will be held in their raised position until the treadle t is again depressed by the operator.

What I claim is—

1. A cap-flanging machine provided with flanging-rollers, and means for suspending a bottle by its head beneath said rollers, substantially as specified.

2. A cap-flanging machine provided with flanging-rollers, means for suspending a bottle by its head beneath said rollers, and means for imparting intermittent movement to the suspending means, substantially as specified.

3. A cap-flanging machine provided with a head, flanging-rollers carried thereby, means for imparting a rotatory and vertical movement to the head, and means for suspending a bottle beneath the head, substantially as specified.

4. A cap-flanging machine provided with a head, flanging-rollers carried thereby, means for imparting a rotatory and vertical movement to the head, a chuck centered between the rollers, and means for suspending a bottle beneath the head, substantially as specified.

5. A cap-flanging machine provided with a spring-influenced chuck, a head independently rotatable from said chuck, flanging-rollers carried by the head, and means for suspending a bottle beneath the head, substantially as specified.

6. A cap-flanging machine provided with a cam, an elbow-lever actuated thereby, an interposed yielding connection, a rotatable and axially-movable shaft operatively connected to the elbow-lever, flanging-rollers operatively connected to the shaft, and means for suspending a bottle by its head beneath said rollers, substantially as specified.

7. A cap-flanging machine provided with flanging-rollers, an intermittently-rotatable feed-table, and means for suspending bottles from said table, substantially as specified.

8. A cap-flanging machine provided with flanging-rollers, an intermittently-rotatable feed-table, means for locking the table during its periods of rest, and means for suspending bottles from said table, substantially as specified.

9. A cap-flanging machine provided with flanging-rollers, a notched feed-table, and a movable jaw hinged to said table, substantially as specified.

10. A cap-flanging machine provided with flanging-rollers, a notched feed-table, a movable jaw hinged thereto, and a catch for closing the jaw, substantially as specified.

11. A cap-flanging machine provided with flanging-rollers, a notched feed-table, a movable jaw hinged thereto, a pair of keepers on the jaw, and a catch adapted to successively engage the keepers, substantially as specified.

12. A cap-flanging machine provided with flanging-rollers, a notched feed-table, a movable jaw hinged thereto, a roller for closing the jaw, a pair of keepers on the jaw, and a catch adapted to successively engage the keepers, substantially as specified.

13. A cap-flanging machine provided with flanging-rollers, a notched feed-table, a movable spring-influenced jaw hinged thereto, a keeper on the jaw, a catch having a tailpiece and adapted to engage the keeper, and a roller adapted to engage the tailpiece, substantially as specified.

14. A cap-flanging machine provided with flanging-rollers, a notched feed-table, a clamp secured thereto, and buffers secured to the clamp, substantially as specified.

15. A cap-flanging machine provided with an intermittently-rotatable feed-table, a clamp for suspending a bottle therefrom, a rotatable and vertically-movable head above the table, flanging-rollers journaled in the head, and a chuck centered between the rollers, substantially as specified.

Signed by me at New York city, (Manhattan,) New York, this 28th day of April, 1905.

JULIUS BRENZINGER.

Witnesses:

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FRANK V. BRIESEN.