H. J. CHILTON.

BOTTLE HANDLING APPARATUS.

APPLICATION FILED FEB. 6, 1911.

1,043,066.

Patented Nov. 5, 1912.

2 SHEETS—SHEET 1.

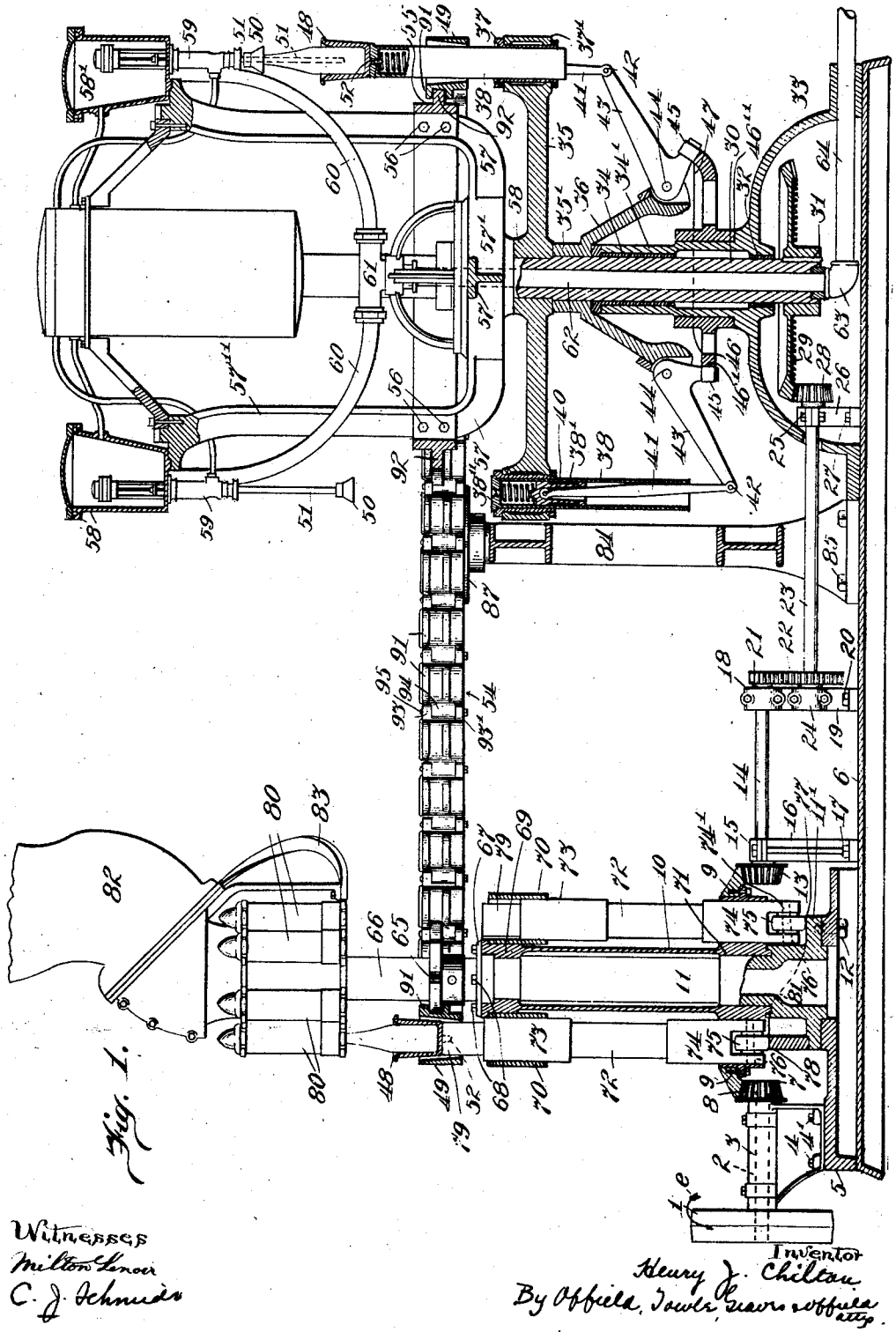

Fig. 1.

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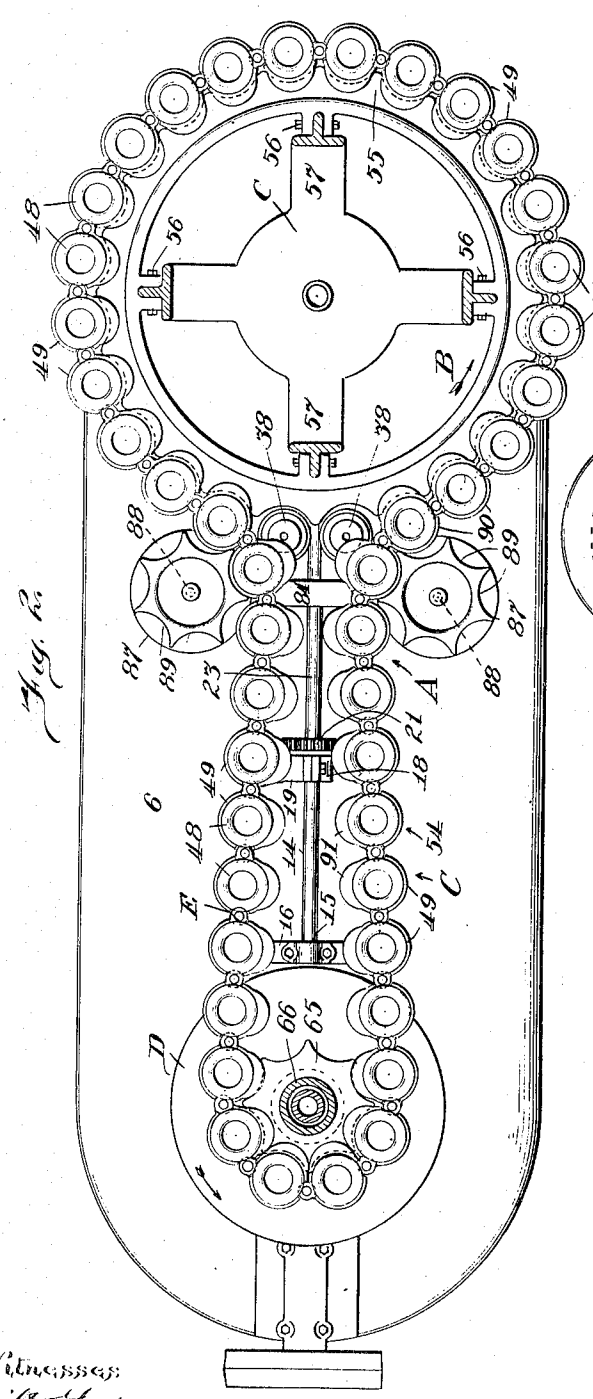

Fig. 2.

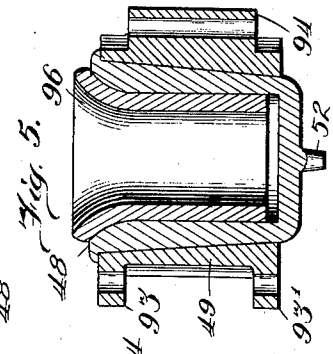

Fig. 5.

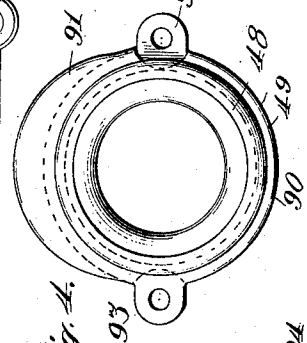

Fig. 4.

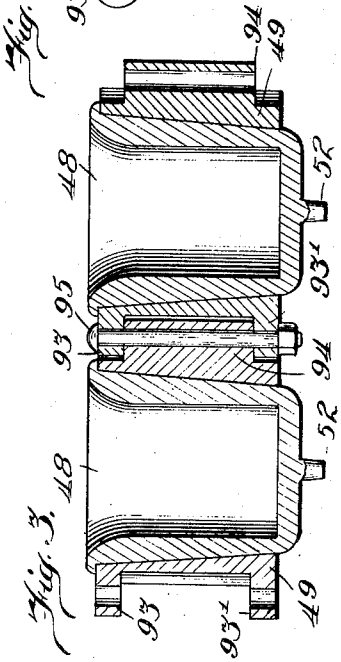

Fig. 3.

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UNITED STATES PATENT OFFICE.

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BOTTLE-HANDLING APPARATUS.

1,043,066. Specification of Letters Patent. Patented Nov. 5, 1912.

Application filed February 6, 1911. Serial No. 606,737.

To all whom it may concern:

Be it known that I, HENRY J. CHILTON, a citizen of the United States, residing in the city of Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Bottle-Handling Apparatus, of which the following is a specification.

This invention relates to improvements in bottle handling apparatus, and refers more particularly to a combined filling and capping machine of the rotary type.

Among the salient objects of the invention is to provide a construction in which the bottles are first filled in a suitable filling machine, preferably of the rotary type, and are then automatically conveyed to a capping machine, preferably of similar type, in which they are also automatically capped; to provide a construction which eliminates the necessity of any manual labor in conveying the bottles from the filling to the capping devices; to provide a construction in which the bottles are automatically and successively moved in alinement with the filling and capping devices by means of a traveling conveyer; to provide in a construction of the character referred to means for supporting the bottles against lateral displacement during the operations of capping and filling, and at the same time affording a better contacting surface for the actuating plungers which raise and lower the bottles; and in general to provide an improved construction of the character referred to.

The invention consists in the matters hereinafter described and more particularly pointed one in the appended claims.

In the drawings—Figure 1 is a view partly in side elevation and partly in vertical section of my invention. Fig. 2 is a plan view of the same with certain parts shown in section. Fig. 3 is an enlarged sectional detail of a portion of the conveyer and bottle holding cups. Fig. 4 is a plan view of the same but showing a removable bushing within the cup. Fig. 5 is a vertical sectional view of Fig. 4.

In the drawings, C designates as a whole the filling machine and D the capping machine. The bottles are conveyed around each of these machines and delivered from the filling machine to the capping machine by means of an endless conveyer designated as a whole E. Upon the base frame of the machine is mounted a drive shaft 2, to the upper end of which is rigidly attached a main drive pulley 1 which is driven by any suitable source of power in the direction shown by the arrow *e*. This shaft 2 is journaled in the bearing 3 carried by brackets 4 secured to the base 5 by means of bolts 4′. The base 5 is mounted upon a suitable main base 6, as shown. The opposite end of the shaft 2 carries a pinion 7 meshing with a gear 8 secured by tap bolts 9 to the rotating standard 10 of the capping machine. The standard 10 of this frame is journaled in the upright stationary post 11 which extends through the standard 10. The lower part of the post 11 is provided with a horizontally extending flange 11′ by which it is secured to the base 5 by means of bolts 12. The annular gear 8 in turn drives a shaft 14 through a pinion 13 carried by this shaft. The latter is journaled in bearings 15 and 18 carried respectively by brackets 16 and 19 mounted upon the base 6, and secured thereto by bolts 17 and 20. Upon the other end of the shaft 14 is mounted a pinion 21 which meshes with a similar pinion 22 carried by a parallel counter-shaft 23. One end of this shaft is journaled in a bearing 24 formed in the bracket 19, while the opposite end of the shaft is rotatably seated in a similar bearing 25 carried by the standard 26. The latter is secured to the base 6 by means of tap bolts 27. The right hand end of the shaft 23 is similarly provided with a bevel pinion 28 which drives a relatively large annular gear 29. This gear 29 is keyed by means of a feather 31 to a hollow drive shaft 30 which forms the main driving shaft of the filling mechanism. This drive shaft extends vertically through a stationary standard 34′. The latter forms the main supporting standard of the filling mechanism and is provided at its lower end with an enlarged base 33 which rests upon the floor 6 of the machine. The lower end of the drive shaft 30 is rotatably seated in a bearing 32 secured to the standard 34′ and at its upper end is similarly journaled in a bushing 34 secured to the upper end of the standard 34′. To the upper end of the vertical shaft 30 is rigidly secured a plunger bracket 35 which rests upon a sleeve 35′ carried by the upper end of the stationary standard 34′. This sleeve 35′ is provided with a downwardly flaring extension 36

forming a support for bell-crank members hereinafter described.

The outer end of the bracket 35 is provided with a series of circumferentially extending seats 37′ in which are seated bushings 37 to receive the plungers 38 of the filling mechanism. Each of these plungers 38 is preferably hollow, as shown in Fig. 1, and is provided interiorly with a movably supported cap member 38′, to which is pivotally connected, as shown at 40, a rod 41. The lower end of this rod is pivotally connected, as shown at 42, to a bell crank 43. The latter in turn is pivoted to the extension 36 of the sleeve 35′ by means of pin 44. The upper end of each plunger 38 is closed, as shown at 38″, and between the top 38″ and the upper end of the cap 38′ is interposed a coiled expansion spring 39 whereby the cap 38′ is yieldably supported. The opposite end of each bell-crank 43 is provided with a roller 45 which rides upon a cam track 46′ carried by the bracket 46 mounted on a shoulder 46″ upon the extension 33 of the main standard. This cam track 46 is so arranged that during a given period of the rotation of the filling machine the rollers 45 will ride upwardly and outwardly, actuating the corresponding bell-cranks and forcing the plungers 38 upwardly. The arrangement is such that as the plungers are forced upwardly they will engage the bottle holders 48 hereinafter described and carry the bottles upwardly into engagement with the filling devices. These filling mechanisms may be of suitable construction, and preferably comprise filling tubes 51, centering mouth pieces 50. The mouth pieces 50 are telescopically mounted on the tubes 51 and operate a valve mechanism not shown, causing the liquid to escape through the tubes while the bottles are held in their uppermost position. The roller 45, as it rides off of the raised portion 47 of the cam track, lowers the plungers 38 back to their original position by means of the bell-cranks, whereupon the bottles are automatically carried out of engagement with the filling mechanisms.

Referring more particularly to Figs. 3 and 5, it will be noted that upon the lower end of each bottle holder 48 is formed a centering pin or stud 52, which is adapted to register with the opening 53 in the top of the plunger 38. The arrangement just described prevents the bottle holders from lateral displacement when they are raised out of the conveyer cups 49. These conveyer cups 49 are open at either end and of such shape as to accurately hold the cups. Preferably these cups themselves form the links of the conveyer. This conveyer is trained around a sprocket wheel 55 which is rigidly secured by bolts 56 to arms 57 extending radially from the casting 57′, which forms the main frame support of the filling mechanism. This frame support 57′ is carried by the rotary shaft 30 and rests upon the enlarged head portion 58 forming part of the support 35. The outer ends of the arms 57 are provided with vertical extensions 57″ which carry the tank 58′. The filling mechanism is also provided with suitable valves 59 which form no part of the present invention. Liquid is supplied to the filling tank 58′ through pipes 60 which are connected to a main supply pipe 62 through a T-connection 61. This main supply pipe 62 extends through the vertical shaft 30 and is connected to a horizontal supply pipe 64 by connection 63. This chain after being trained around the sprocket of the filling mechanism leads thence to a smaller sprocket 65 rigidly secured to the standard 66 which supports the capping mechanism. The lower end of this standard or post 66 is provided with a flange 67 bolted by means of bolts 68 to a head 69 upon the upper end of the rotary standard 10. To the enlarged head 69 of the rotary member 10 is rigidly secured in any suitable manner an annular series of sleeves or bushings 70. The lower end of the rotary standard 10 is provided with similar bushing 71 in alinement with the bushing 70. These bushings 70 and 71 serve as guides for the plungers 72. The latter are preferably provided at either end with enlarged heads 73 and 74 respectively, which fit closely within the respective bushings 70 and 71. The lower ends of the heads 74 are forked as shown at 74′ in which are journaled rollers 75 on pins 76. These rollers 75 ride upon an annular cam track 77 formed on the flange 11′ of the stationary post 11.

As the capping machine is rotated the cam rollers 75 will ride around this track and as they pass onto the raised portion 78 thereof, will force the plungers 72 upwardly into engagement with the bottle holders 48. The upper end 79 of the plunger 73 is recessed to receive the centering pins 52 of the bottle holders 48. After the rollers 75 have traveled over the raised portion of the track 77 they ride onto the downwardly sloping portion 81, thus carrying the plungers back to their normal position and restoring the bottle holders to their seats in the conveyer. These caps are fed to the cappers 80 through a chute 83 from a stationary hopper 82 in a well known manner. This hopper 82 is held from rotary movement by a part of the frame not shown. The conveyer is centrally supported by means of a standard 84 secured by bolts 85 to the sub-base 6. On the upper portion of the standards 84 are rotatably mounted idler sprocket wheels 87 pivotally secured to pins 88 mounted in the standard 84. The sprockets 89 of the sprocket wheels

87 engage the outer sides 90 of the cups 49 of the conveyer chain.

In Fig. 4 is shown in detail plan view one of the conveyer cups 49; each conveyer cup being provided with radially outstanding flanges 91, which in passing around the sprocket wheel 55 straddle the rib 92 thereon. At the right hand side of Fig. 1 these parts are shown in section, and in Fig. 2 in plan; the purpose of this construction being to hold the conveyer cups against vertical movement. The cups 49 which form the links of the chain are provided with lugs 93, 93′ which interfit with lugs 94 carried by the adjacent cup, these lugs being pivotally secured by means of bolts 95. Each cup is obviously provided with the spaced apart lugs 93, 93′ and the interfitting lug 94. In order that the machine may be accommodated to bottles of various sizes, the bottle holders 48 may be provided with removable bushing 96 for smaller bottles.

The operation of the machine is apparent from the foregoing description and need not be described in detail. It will be noted, however, that the parts are so inter-connected that the filling and capping devices are rotated synchronously with the bottle holding conveyer. The bottles are at all times maintained in proper centered position.

The invention is not limited to the details of construction shown except as set forth in the appended claims.

I claim as my invention:

1. In a bottle handling apparatus, the combination with a rotary filling machine, of a rotary capping machine, an endless conveyer chain extending around said machines and rotating therewith, and bottle holders detachably seated in said chain.

2. In a bottle handling apparatus, the combination with a rotary filling machine, of a rotary capping machine, an endless conveyer chain extending around said machines and rotating therewith, bottle holders detachably seated in said chain and adapted to carry and support the bottles, and means for vertically reciprocating said bottle holders.

3. In a bottle handling apparatus, the combination with a rotary filling machine, of a rotary capping machine, a conveyer extending around said machines and rotating therewith, bottle holders carried by said conveyer, and adapted to carry and support the bottles, and reciprocatory mechanism for automatically carrying said bottles into adjustment respectively with the filling and capping mechanisms, and means for operating said parts synchronously.

4. In a bottle handling apparatus, the combination with a rotary filling machine, of a rotary capping machine, conveyer mechanism for automatically carrying the bottles from the filling machine to the capping machine, bottle holders carried by the conveyer for supporting and carrying the bottles and reciprocatory mechanism for automatically forcing the bottles out of the conveyer into engagement with the respective filling and capping mechanisms, said parts being operated in properly timed relation.

5. In a bottle handling apparatus, the combination with a rotary filling machine, of a rotary capping machine, an endless conveyer extending around said machines and traveling therewith, bottle holders detachably mounted in said conveyer, reciprocatory plungers associated with each machine and adapted to force the bottle holders out of the conveyer at predetermined intervals in the travel of the conveyer, and means for operating said parts in properly timed relation.

6. In a bottle handling apparatus, the combination with a rotary filling machine, of a rotary capping machine, an endless conveyer extending around said machines and traveling therewith, the links of said conveyer forming bottle holding cups, and means for automatically forcing the bottles out of the conveyer into operative engagement with the filling and capping mechanisms, said parts being operated synchronously.

7. In a bottle handling apparatus, the combination with a rotary filling machine, of a rotary capping machine, a conveyer extending around said machines and traveling therewith, the links of said conveyer forming bottle holding cups, bottle holders detachably seated in said cups, and means for automatically forcing the bottle holders out of said cups to carry the bottles into operative engagement with the filling and capping mechanisms respectively.

8. In a bottle handling apparatus, the combination with vertically extending members rotating each around its own axis, an endless conveyer chain trained around said rotary members and moving in a horizontal plane, means for moving the bottles out of the conveyer at predetermined intervals in the travel of the latter, and means for operating said parts in properly timed relation.

9. In a bottle handling apparatus, the combination with a rotary filling machine, a rotary capping machine, an endless conveyer extending around said machines, bottle supporting devices carried by the conveyer and detachably seated therein and adapted to hold the bottles, and means for reciprocating said bottle supporting devices vertically during predetermined points in the travel of the conveyer around said filling and capping machines.

10. In a bottle handling apparatus, the combination with a rotary filling machine, of a rotary capping machine, a conveyer

traveling around said machines, bottle holders carried by the conveyer and adapted to hold and support the bottles, and means for vertically shifting said bottles upwardly into operative position relative to the filling and capping machines at predetermined points in the travel of the conveyer.

11. In a bottle handling apparatus, the combination with a rotary filling machine, of a rotary capping machine, an endless conveyer extending around said machines and adapted to support and carry bottles, reciprocatory mechanism for shifting the bottles into operative engagement with the filling and capping machines, a common driving member and operative connections between the conveyer and filling and capping machines and said common driving member whereby said parts are operated synchronously.

12. In a bottle handling apparatus, the combination with filling mechanism, capping mechanism, a conveyer traveling around said mechanisms, bottle supporting devices detachably seated in said conveyer and means for reciprocating said bottle supporting devices vertically at predeterminate points on the passage of the conveyer around said capping and filling mechanisms.

13. In a bottle handling apparatus, the combination with filling mechanism, of capping mechanism, a conveyer traveling around said mechanisms, a length of said conveyer forming bottle holding cups, bottle holders detachably seated in said cups and means for automatically forcing the bottle holders out of said cups to carry the bottles into operative engagement with the filling and capping mechanisms.

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