(No Model.) 3 Sheets—Sheet 1.

S. B. SMALLWOOD.

BOTTLE CORKING MACHINE.

No. 523,015. Patented July 17, 1894.

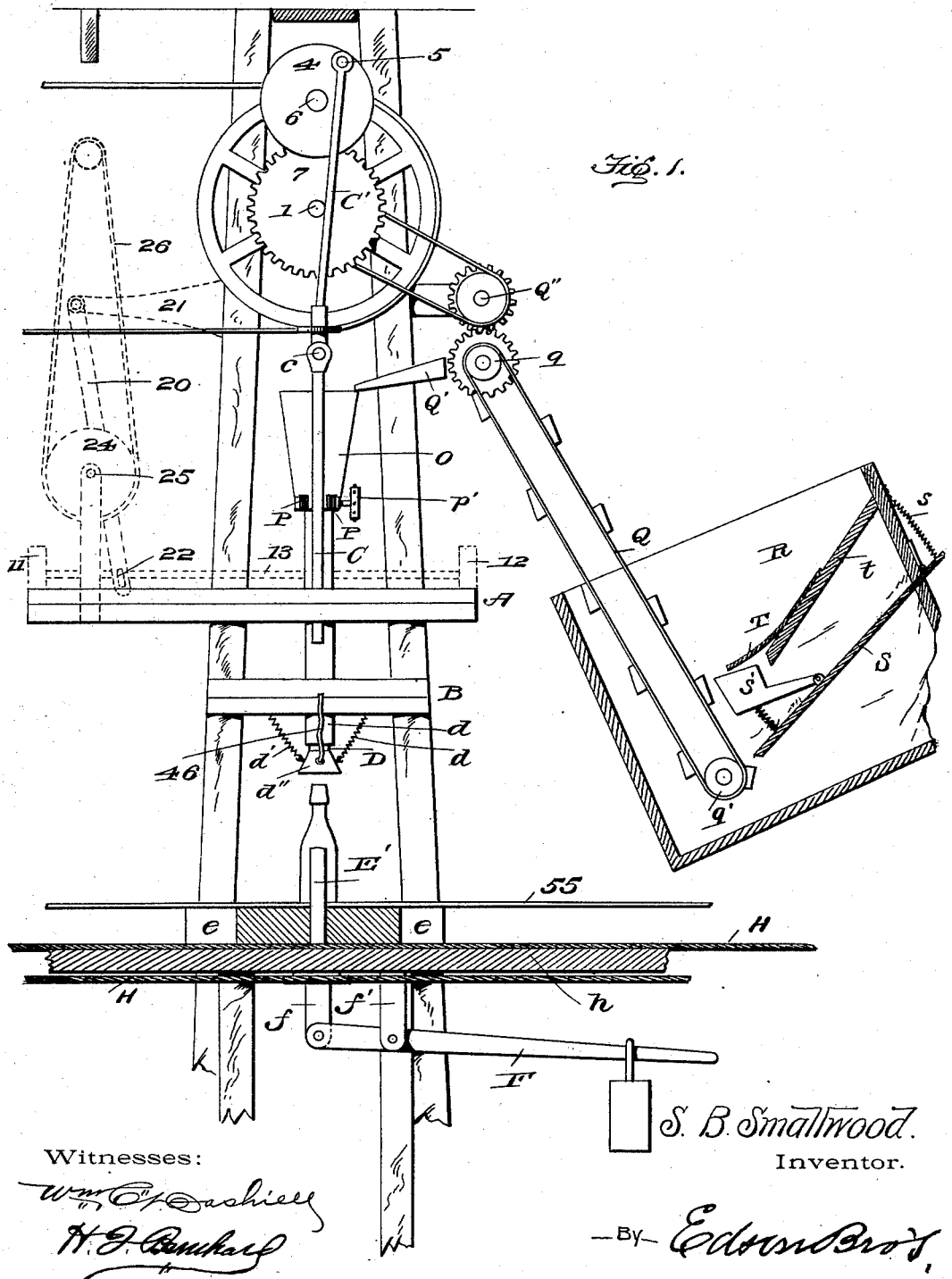

Fig. 1.

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(No Model.) 3 Sheets—Sheet 2.

S. B. SMALLWOOD.

BOTTLE CORKING MACHINE.

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Fig. 2.

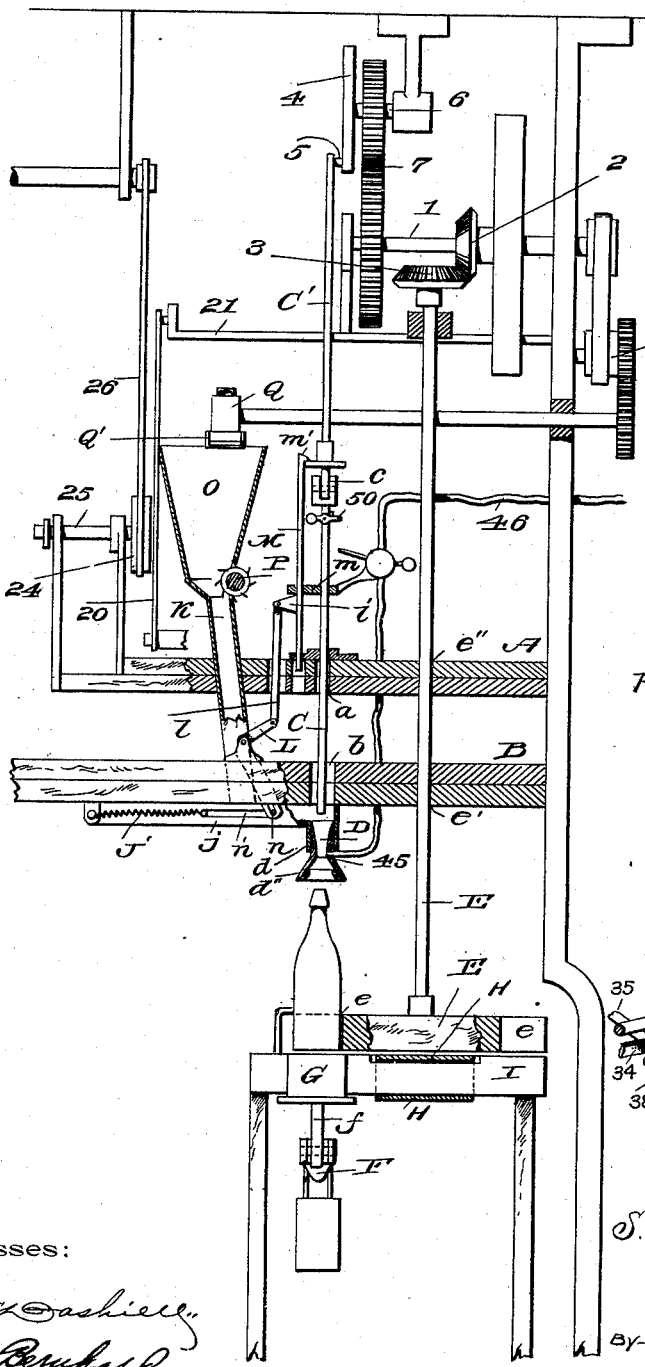


Fig. 10.

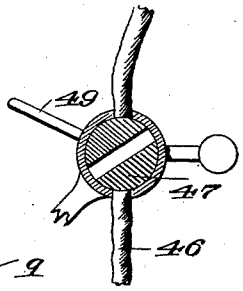


Fig. 11.

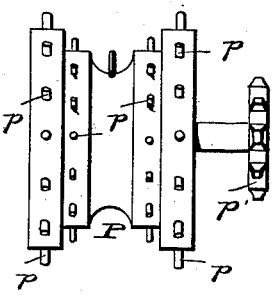
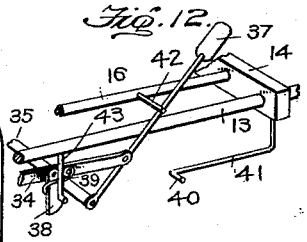


Fig. 12.



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(No Model.) 3 Sheets—Sheet 3.

S. B. SMALLWOOD.

BOTTLE CORKING MACHINE.

No. 523,015. Patented July 17, 1894.

Fig. 6.

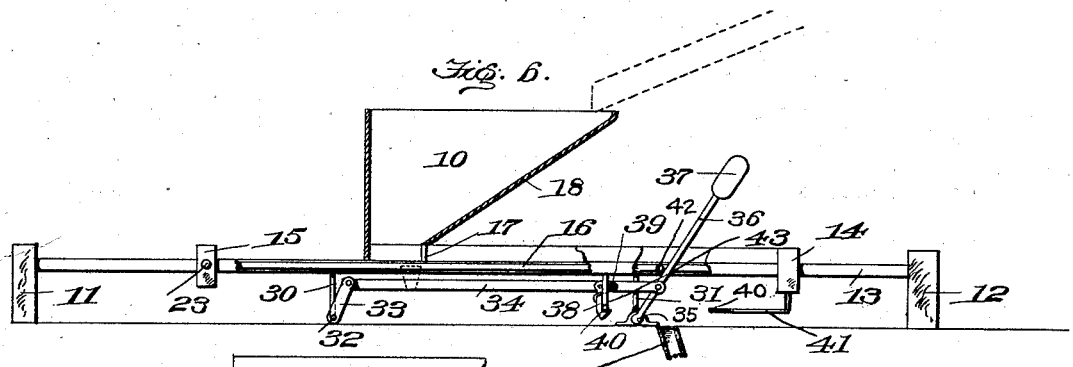


Fig. 7.

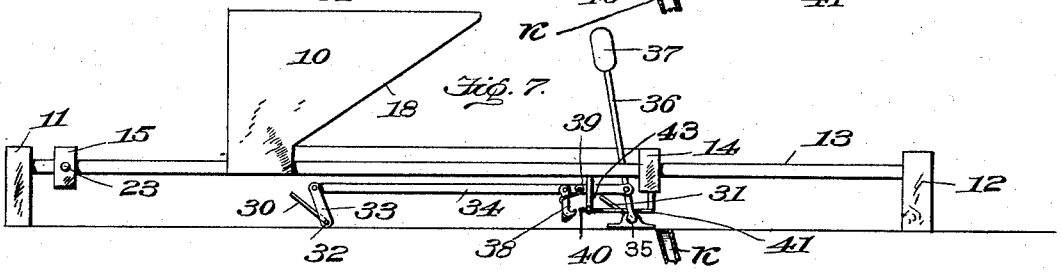


Fig. 8.

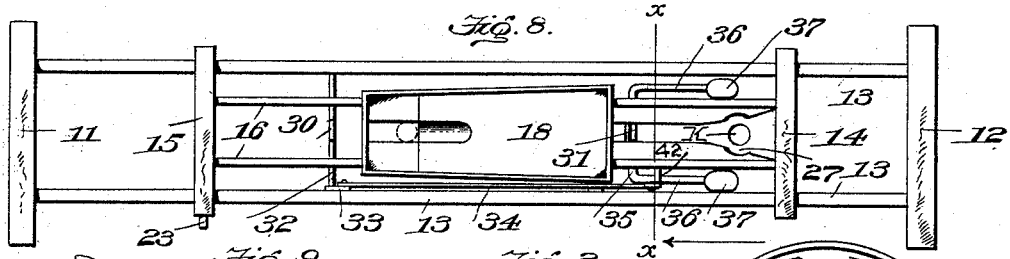


Fig. 9.

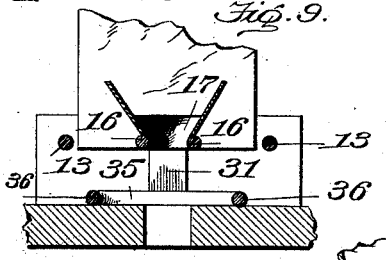


Fig. 3.

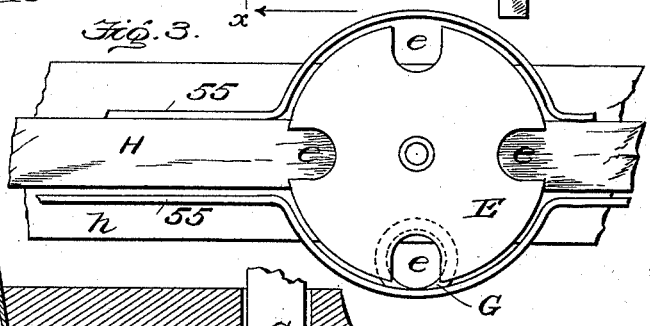
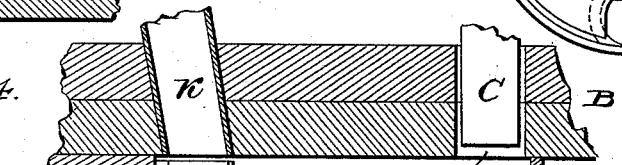
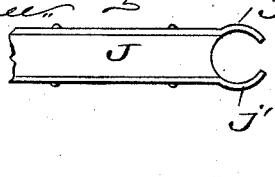


Fig. 4.



Witnesses:
Wm. E. Dashiell.
H. C. Bernhard

Fig. 5.



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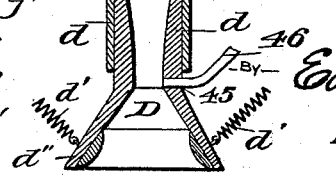
Inventor.



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UNITED STATES PATENT OFFICE.

SAMUEL B. SMALLWOOD, OF LONG ISLAND CITY, NEW YORK.

BOTTLE-CORKING MACHINE.

SPECIFICATION forming part of Letters Patent No. 523,015, dated July 17, 1894.

Application filed April 9, 1894. Serial No. 506,890. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL B. SMALLWOOD, a citizen of the United States, residing at Astoria, Long Island City, in the county of Queens and State of New York, have invented certain new and useful Improvements in Bottle-Corking Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to machines for corking bottles designed for use in connection with bottle filling machines which I have shown and described in applications for Letters Patent filed November 21, 1893, February 2, 1894, and February 8, 1894, bearing Serial Nos. 491,444, 498,926, and 499,539 respectively, although my corking machine may be used independently of a bottle filling mechanism, so that I reserve the right to use the present invention in a separate machine from the filling machine.

The object that I have in view is to automatically apply corks to the bottles as they are fed to the machine without liability of breakage or damage to the bottle; to enable the machine to be used to feed and apply straight or tapered corks; and in bottling liquids containing gas under pressure, to automatically supply the necessary quantity of gas to the bottle as the cork is forced therein whereby the gas is compressed into the bottle as the cork is forced therein, the operation of feeding the bottles and the corks to the corking mechanism, applying the corks to the bottles, and conveying the bottles after they have been corked away from the corking mechanism being carried on continuously and automatically.

With these ends in view, the first part of my invention consists in the combination of a tubular guide through which the corks are to be fed to a bottle which is moved by a carrier so that the open end of the bottle fits in the mouth of said tubular cork tube, a plunger reciprocated vertically above the tubular cork-tube and adapted to enter the same on its down stroke, a horizontally movable slide for moving the corks to a position over and in line with the cork-tube, and cork-feeding mechanism for supplying the corks one at a time to the horizontally movable slide.

I construct the cork feed devices to supply either straight or tapered corks to the bottle as may be preferred, the corks being placed promiscuously in a hopper and being supplied one at a time in proper position to the transversely movable feed slide. The device for feeding straight corks, that is corks which are practically uniform in diameter, consists of a hopper, a feed tube leading from the hopper to a point over the feed-slide, and an agitator-roller adapted to be positively driven by a belt or chain and journaled in bearings at open side of the hopper, said agitator roller being constructed to fit close to the open mouth of the upright feed tube and provided with projections which lift the corks in the hopper so as to agitate the same and cause them to enter the feed tube properly. In feeding tapered corks, they must be righted or turned to a vertical position with the smaller end downward, and to accomplish this I employ a horizontally reciprocating hopper over the feed-slide and which is provided with a cork-way or guide into which the corks are dropped, a detent at one end of the hopper and arranged to be lifted into the path of the cork suspended between the cork-guide when the hopper moves in one direction, another detent carried by a weighted rock shaft and operating to force the cork to the discharge opening in the cork way as the hopper moves in the opposite directions, so that the cork is forced by the detents along the cork way during the reciprocation of the hopper and caused to drop through the feed opening into the feed slide, the hopper being reciprocated by lever and crank connections with the driving shaft and the two detents being linked together to have simultaneous movement or throw in opposite directions as the hopper reciprocates back and forth.

My invention further consists in means for automatically supplying gas under pressure to the bottles containing a fluid charged with gas, such for instance as in bottling beer or carbonated waters. The tubular cork guide is provided with a gas supply tube near its

lower end or at the flared mouth which receives the neck of the bottle, and from this gas tube leads a flexible pipe to an automatic closing valve which has a tappet arm arranged in the path of a latch on the plunger or crosshead, and from this automatic valve a pipe leads to a tank or generator for the carbonic gas or other gas it is desired to supply to the liquid in the bottle just prior to forcing the cork therein, the whole being organized for automatic operation to admit the gas under pressure to the cork tube between the cork and the bottle and as the plunger forces the cork and the gas into the bottle, the latch clears the tappet on the automatic valve to permit the latter to close and shut off the supply of gas before or at the time the cork passes the gas supply tube in the cork-tube, thus preventing waste of the gas, the latch on the plunger or cross head being adapted to yield on the upstroke of the plunger or head to avoid the valve.

The invention further consists in the combination of devices, and in the construction and organization of parts, as will be hereinafter more fully described and claimed.

To enable others to more readily understand my invention, I have illustrated the same in the accompanying drawings, forming a part of this specification, and in which—

Figure 1 is a front elevation, partly in section, showing the bottle within the mouth of the cork-tube and in position to receive the cork. Fig. 2 is a view in side elevation, at right angles to the elevation of Fig. 1, certain parts being in section to more clearly show the construction. Fig. 3 is a detail plan view of the traveling carrier-apron and the rotary bottle-carrier. Fig. 4 is an enlarged detail vertical sectional view through the platform, the cork tube, a part of the horizontally movable feed slide, showing a part of the cork feed tube K, and the lower part of the plunger C. Fig. 5 is a detail plan view of a part of the feed slide. Figs. 6, 7 and 8 are detail views of the cork feed mechanism by which tapered corks are righted and fed successively to the opening leading to the feed slide. Fig. 9 is a detail cross sectional view on the line x—x of Fig. 8 of the taper-cork feed-mechanism shown by Figs. 6, 7 and 8. Fig. 10, is a detail view, partly in section and partly in elevation, of the automatically closing valve by which gas is supplied to carbonated liquids, and Fig. 11 is a detached detail view of the rotary cork agitator adapted for use in the cork-hopper O. Fig. 12 is a detail view of the arm, 41, having the stud 40 on the front crosshead 14.

Like letters and numerals of reference indicate corresponding parts in all the figures of the drawings, referring to which—

A, B, designate two parallel platforms or tables arranged a suitable distance one above the other and suitably fastened to the upright main frame of the machine, said tables being furnished with vertically aligned openings or bushings a, b, respectively, through which openings or bushings plays the vertically reciprocating plunger C, the purpose of which is to force the cork through the vertical cork tube D into the bottle resting in the horizontally rotating carrier E.

From the lower side of the lower platform B depends a guide tube d, and in this guide d is fitted the cork tube D, which is free to play or move vertically a limited distance therein, said cork tube D being yieldingly suspended by means of the coiled springs d' having their ends attached respectively to the flared mouth d'' of the cork tube and to the bottom side of the platform B, see Fig. 1. The lower end of this yieldingly suspended cork tube is enlarged and flared at d'' to form a bell shaped mouth, the inner surface of which is lined with rubber or other soft material to afford a cushioned seat for the mouth of the bottle, said flared mouth d'' serving to center the bottle within itself and the cushion and springs affording a yielding connection to secure the necessary tight fit or joint between the mouth d'' of the cork tube and the mouth of the bottle when the tube D is forced downward by the action of the plunger against the cork in the tube D, the bottle resting on a vertically movable platen G that is arranged in vertical alignment with the cork tube D and the reciprocating plunger.

The bottles to be corked are conveyed by an endless traveling apron H to the carrier E, and this apron travels over and around a horizontally fixed guide-board h which apron and board extend on opposite sides of the bed, I, so that the apron serves to convey the bottle to and from the corking mechanism, the guide board h affording a support to the upper side of the apron to prevent it from sagging under the weight of the bottles. The carrier apron extends directly through the corking machine, at or about its vertical center, and the corking mechanism is situated at one side of the vertical center of the machine and the carrier apron, see Fig. 2. As the carrier apron is not capable of standing the strain and impact of the plunger when the cork is forced into the bottle, and as the vertically movable platen G controlled by the weighted lever affords a yielding resistance to the plunger and bottle, to obviate breaking the mouth of the bottle when the cork is forced therein, I employ the horizontally rotatable carrier E to move the bottles one at a time from the carrier apron to the platen G, the carrier E is then stopped momentarily while the plunger descends to force the cork into the bottle, and the carrier is again turned to shift the corked bottle from the platen G back to the off-bearing side of the carrier apron H, the carrier E being rotated with a step by step feed. This carrier E is preferably constructed in the form of a disk or disks, and provided with a series of radial seats, e, see Fig. 3, which illustrates

four of the seats and shows two of the seats *e* in line with the apron H and another seat *e* adapted to be brought into line with the cork D and platen G, the fourth seat being empty. This rotary carrier E is arranged just above, but close to the apron H, and it is fixed to and rotates with a vertical shaft E′, which shaft is journaled in vertically aligned bearings *e*″, *e*′ in the upper and lower tables A, B. The upper end of the shaft is driven from a power shaft 1 by the intermeshing gears 2, 3, which are so formed as to impart to the shaft E′ and the carrier E an intermittent or step-by-step feed in order that the carrier may remain stationary for a moment or two while the cork is being forced into the bottle. The drive gears 2, 3, in the instance shown are adapted to turn the shaft E′ and carrier E a quarter turn, then stop, then another quarter turn, and so on, which is effected by removing certain of the teeth from one of the gears, 2, at two points around the periphery of the gear, thus forming a mutilated drive gear in the vacant spaces of which the teeth on the gear 3 remain idle while the gear 2 continuously rotates.

Although I have shown and described a drive gear as adapted to rotate the carrier E with a rest between each quarter turn, yet it is obvious that the carrier may be stopped at more or less frequent intervals according to the speed desired for corking the bottles.

The platen G is loosely fitted and guided in the platform, I, and to a depending stem on the platen is connected the short arm of the lever F, the latter being fulcrumed to a hanger or stud *f*′ on the fixed platform, I, see Fig. 1. The platen G is adapted to receive the bottle as it is brought by the carrier E to a position beneath the cork-tube, and as the carrier stops, the plunger C descends to force the cork into the tube, the cork being compressed in the tube D so as to force the tube D downward a limited distance with the cork and plunger, whereby the flared mouth d^2 of the cork tube is caused to fit over the mouth of the bottle and the necessary tight joint is secured between the cushioned seat in the flared mouth of the tube D and the mouth of the bottle. The bottle mouth is also centered in the cork tube, and the platen G being controlled by the weighted lever affords sufficient resistance to the depression of the bottle when the cork is forced therein so that the bottle can be properly corked, but in case this cork does not properly enter the bottle, the downward pressure of the plunger acts to depress the bottle and the platen against the action of the weight in order to prevent breaking of the bottle under undue strain.

The upper end of the plunger C is connected with the pitman C′ by the crosshead and pivot connection *c*, and the pitman and plunger are reciprocated by a crank disk 4 which has a wrist pin 5 on which the pitman works, said disk 4 being fixed to a shaft 6, which is journaled in suitable bearings on the machine frame, the shaft 6 being belted or geared as at 7 in Fig. 2, to the power shaft.

On the under side of the lower table B of the machine is formed or provided a horizontal guide way *j* which extends at right angles to the cork tube D, one end of the guide way opening into the space between the cork tube and the aperture *b* through which the plunger C reciprocates. In this horizontal guide way is fitted the horizontally reciprocating feed slide J, the purpose of which is to feed the corks to a position over the tube D in the path of the plunger C. This feed slide J is provided at one end with elastic or yielding jaws *j*′ which are formed by spring plates attached to the opposite edges of the slide and having their free projecting ends curved reversely to each other, see Fig. 5, to enable a cork to be fed or dropped into said jaws when the feed slide is reciprocated to bring the jaws in line with a feed spout K. This feed slide J is positively reciprocated in one direction by connections with the plunger C, and in Fig. 2 of the drawings I have shown these connections as consisting of a bell crank lever L, a pitman *l*, and a reciprocating stem M. This stem M is disposed vertically alongside of the plunger and guides in a fixed bridge *m* and having its upper enlarged end *m*′ in the path of the crosshead *c* of the plunger so that as the plunger and crosshead are lifted the head *m*′ and rod M will be raised to actuate the feed slide. The bell crank lever L is fulcrumed in suitable bearings on the table B, and the upper end of this lever is connected by the link *l* to a lug or stud *l*′ on the vertically reciprocating stem M. The lower arm of the bell crank lever L plays freely in a slot in the table B, and said arm has a pin and slot connection *n* with the feed slide, the pin being attached to the slide J and working in a slot *n*′ in the guideway *j*, see Fig. 2. The feed slide is normally drawn back by a coil retracting spring J′ which is attached to the slide and to a suitable lug on the bottom of the table B on the guide way, *j*, so that the jaws *j*′ are normally in position beneath the feed tube K, and as the plunger C rises, its crosshead *c* strikes the head *m*′ of the stem M, lifts the latter, and operates the link *l* and lever, L, to force the feed slide J forward to convey the cork in the jaws *j*′ to a position beneath the plunger and above the tube D, whereby on the return stroke of the plunger C the cork is forced into the tube D, the spring J′ returning the feed slide to its normal position beneath the feed tube K.

The corks are automatically supplied one at a time to the feed tube K, and I have devised mechanism by which either straight or tapered corks may be fed to the feed slide. The straight cork feed mechanism consists of a hopper O supported in an elevated position above the table A, and from the bottom of this hopper O leads the tube K, which is continuous from the table B to the elevated hop-

per. This hopper is preferably tapered as shown, and through the bottom thereof opens the upper end of the feed tube K. To agitate the corks in the hopper and cause them to properly enter the feed tube, I provide an agitator P which preferably consists of a roller which is fitted in an opening in the side of the hopper and has its shaft journaled in suitable bearings thereon. This roller is constructed to fit closely to the upper open end of the feed tube, by forming an annular channel or groove in the middle part of the roller, said channel or groove being semi-circular or approximately V-shape in contour to receive the cork tube, and on annular ledges of the roller are provided tangential pins or projections, *p*, which are arranged to lift the corks and cause them to enter the open receiving end of the feed tube. The agitator roller P, shown by Figs. 2 and 11, is adapted to be positively rotated or driven by a chain arranged to pass around the sprocket wheel *p'* on one end of the shaft of the roller, as will be readily understood, said drive chain adapted to be propelled by a sprocket wheel or pulley on one of the overhead shafts of the machine. This elevated hopper O may be supplied with corks in any suitable manner, and as one mechanism for supplying corks to this elevated hopper I provide the endless elevator Q, the feed chute Q', the primary hopper R, and a mechanism for agitating the corks in the primary hopper. This hopper R may be of large holding capacity so as to contain a barrel of corks which may be dumped promiscuously therein. The endless elevator passes around suitable rollers *q*, *q'*, the upper roller, *q*, being journaled in suitable bearings on the upper frame work of the machine and being geared to a countershaft Q'' belted or geared to the power shaft of the machine, and the lower roller *q'* having its shaft journaled in bearings within the hopper R. The feed chute leads from the discharge end of the elevator to the elevated hopper O so as to properly direct the corks therein. The buckets on the elevator belt are so proportioned and shaped as to each receive and contain one cork, and in the path of these elevator buckets, is arranged the free end of an agitator lever S, which is hung near its rear end to a wall of the hopper R. A spring *s* is connected to the heel of this lever S, and the lever carries a knocker *s'* which is pivoted at its heel to the lever and normally lifted by a coiled spring so as to strike an apron or plate T which is attached to a fixed partition *t* in the hopper R, whereby the corks on the apron or plate T are agitated and supplied to the buckets on the elevator.

The mechanism for righting tapered corks so as to turn them to a vertical position, small end downward, and feed the corks successively in such righted position to the feed slide J, is shown in Figs. 6, 7 and 8 and also partly shown by dotted lines in Figs. 1 and 2, the elevated fixed hopper O and the agitator roller being dispensed with.

On the upper table A of the machine I arrange the reciprocating hopper 10 which is arranged to move in a horizontal path lengthwise of the table A. At opposite ends of the table A are fixed the short upright bearing pieces 11, 12, and to these bearing pieces are rigidly secured the parallel fixed rods 13, 13, which sustain and guide the reciprocating cross heads 14, 15, that carry the hopper 10. The crossheads 14, 15, are arranged in front and rear of this hopper, and said crossheads are connected together by means of the longitudinal parallel plates or rods 16 fastened to the crossheads and to which the hopper is fastened, and these plates or rods 16 are formed into a cork way or guide below the hopper and in front of the same. A discharge opening 17 is formed in the bottom of the hopper, and to this opening leads the inclined front wall 18 of the hopper so as to properly discharge the corks to the opening 17, through which they pass to the cork way formed by the reversely inclined plates 16, the plates being so spaced as to permit the small end of the corks to pass between them while the larger ends of the corks are caught and held by the plates, whereby the corks are suspended or hung small end downward in proper position to be dropped or discharged in the opening or short feed tube K leading to the feed slide J. The hopper is reciprocated back and forth over the table A by the lever 20, shown in Figs. 1 and 2. This lever is hung or pivoted at its upper end to a fixed bracket 21 of the machine, and the lower end of the lever 21 is slotted, at 22, to receive the stud or pin 23 projecting from the rear crosshead 14 which is movable with the plates or rods 16 and the hopper 10; and the lever is swung back and forth by a wrist pin on the crank disk 24, said disk being carried by a shaft 25 which is suitably journaled on the machine and the disk is rotated by a belt or chain 26 driven from one of the overhead shafts of the machine, see Figs. 1 and 2. As the corks are suspended small end downward between the corkway formed by the plates or rods 16, and as the hopper reciprocates back and forth toward and from the upper end of the feed tube K, devices must be provided for moving the corks one at a time longitudinally along the guide way 16 in order that the corks may be supplied successively to the feed tube K. This adjusting device for feeding the corks along the guide way in one embodiment of my invention consists of a detent 30 and a swinging cork plate 31, the detent operating on the rearward motion of the hopper to force the suspended cork from a position below the opening 17 toward the front cross head and the swinging cork plate being held in a raised locked position during a portion of such rearward motion of the hopper, whereby the cork-plate is adapted to hold or

detain a cork in front of the same while the hopper and plates 16 are moving rearward. This cork plate detains the cork until the plates 16 are moved far enough rearward to bring the widened part 27 of said plates 16 opposite to the cork, whereupon the cork, so detained by the plate 31, passes through the widened part or opening 27 between said plates and thence to the feed tube K, this dropping of the cork in front of the cork plate, 31, taking place when the hopper and the plates 16 reach the limit of their rearward movement.

The detent 30 is rigid with a rock shaft 32 which is journaled on the table A at the rear end of the hopper 10, and this shaft 32 has a crank arm 33 to which is connected one end of a link 34. The cork plate 31 is rigidly fastened to another rock shaft 35 journaled on the table A, below the guide rods and in front of the hopper, and the ends of the rock shaft 35 are provided with arms 36, 36, which extend upward between the fixed guide rods and the rods or plates 16, forming the cork way along the bottom of the hopper, the upper free ends of the arms being provided with counterweights 37 which are of sufficient weight to give the shaft and cork plate the desired quick throw. To one of the arms 36 of the rock shaft is pivoted the forward end of the link 34 so that the two shafts which carry the detent and cork plate are connected together for simultaneous operation, and on this link 34 is pivoted the latch 38 which is controlled by a spring 39 so that its free end is normally in the path of a stud or lug 43 which is fixed to one of the guide rods 13 so that the latch is adapted to come into locking engagement with said fixed stud 43.

On the forward motion of the hopper, the detent 30 and the swinging cork plate 31 remain depressed to allow the corks suspended from the hopper and the cork-way plates to pass over said detent and cork-plate, and at the completion of such forward motion of the hopper and way plates, the detent and cork plate are both raised to an inclined vertical position as shown in Fig. 6 by a stud or pin 42 on one of the cork way plates coming against one of the weighted arms of the rock shaft 35. The detent and cork plate are locked in this position by the latch 38 coming in locking engagement with the fixed stud 43 on one of the guide rods 13, the link or bar moving with the rock shaft 35 and cork plate so as to throw the rock shaft and its detent 30 to the raised position and bring the latch into engagement with the stud 43. As the hopper is moved rearward by the lever, the cork plate and detent are held in their fixed raised positions by the tripping locking mechanism, and the detent and cork plate act as follows on such rearward motion of the hopper and its attached cork way plates:—The detent serves to draw a cork from the bottom of the hopper and force it between the inclined plates forming the cork way to a position where the cork so advanced will be brought, on the next forward motion of the hopper, over the cork plate, while the swinging cork plate itself, which is locked during such rearward motion of the hopper, holds the cork until the inclined cork way plates are moved to a position where the opening 27 is sufficiently wide for the cork to drop down and into the cork tube K that leads to the feed slide. During this rearward movement of the hopper, the detent has advanced a cork between the inclined guide way plates, and at the completion of the rearward motion of the hopper, both the detent and the cork plate are returned to their depressed horizontal positions by a stud 40 which is carried by an arm 41 fixed to the front crosshead, so that when the hopper again moves forward, the corks in the bottom thereof and the cork way plates will pass over the detent and cork plate arm and thus be brought to a position in front of the detent and cork plate when they are again raised to their vertically inclined position. The stud 40 on the arm 41 of the crosshead is so arranged that it will strike the spring pressed latch, during the latter part of the rearward movement of the connected hopper, plates 16, and crossheads 14, 15, and while the detent 30 and cork plate 31 are in the raised locked positions; and this stud 40 and arm 41 are thus adapted to release the latch 38 from locking engagement with the stud 43 and bear against the spring-pressed latch 38 with sufficient force to move the latch and bar 34 rearward, thereby turning the two shafts 32, 35, to restore the detent 30 and cork plate 31 to their depressed positions.

The purpose of the locking mechanism for the cork plate is to hold the latter in fixed relation to the cork way and hopper when raised to the vertically inclined position during the completion of the forward motion of the hopper and while it is traveling rearward, so as to prevent a cork from upsetting or turning the cork plate and detent backward to their horizontally depressed positions should the cork bind in between the inclined plates forming the cork way, and this latch is released by the stud 40 on the arm 41 which extends backward from the front crosshead a sufficient distance to release the latch when rearward movement of the hopper is nearly completed.

In corking bottles which are filled with charged liquid, such as beer and carbonated water, it is necessary to supply gas under pressure to the bottle just previous to the operation of forcing the cork into the mouth of the bottle, in order that the gas will be compressed in the bottle between the cork and the liquid therein, and this object is attained in my invention by providing a gas inlet port or tube 45 in the flared mouth of the cork tube, from which port 45 leads a flexible tube or hose 46 which is connected to an automatic closing valve with a turning plug which is so controlled by a weight, or its equivalent, that

the plug normally cuts off the passage of gas through the valve, the latter being supported on the machine frame and having a pipe connection 48 to a gas tank or generator in which the gas is stored under pressure. This valve 47 has its plug provided with an arm 49 which lies in the path of a tappet 50 on the plunger C, and as the plunger descends and forces the cork into the tube D and the latter is depressed over the mouth of the bottle to form a tight joint therewith, the valve 47 is momentarily opened by the tappet 50 acting against the arm 49 to admit the gas below the cork and into the tube D and the bottle, and as the cork is forced, by the continued descent of the plunger, into the bottle and the gas thus compressed therein, the cock is automatically closed by the tappet 50 clearing the arm 49 of the valve, the tappet on the upstroke of the plunger riding past the arm 49 so as not to open the valve and thus obviate waste of the gas.

This being the construction of my machine, the operation may be described as follows:—The cork is fed to the feed chute K and the feed slide J so as to be in the path of the plunger, and the carrier E moves the bottle from the apron around to the platen G, immediately below the cork tube. The plunger now descends to force the cork into the tube D, and as the cork is compressed and binds in the tube D, the latter moves downward with the cork and plunger so that the mouth d'' fits over the bottle, the latter being centered and held in the flared mouth d'' while the cork is being forced by the plunger into the mouth of the bottle, the weight controlled platen, G, offering such resistance to the impact of the plunger as to hold the bottle firmly in place. In the meantime the carrier E is at rest, but as the plunger rises and the bottle is released from the cork tube D which is lifted by the springs, the carrier E turns to shift the corked bottle back to the apron and move an uncorked bottle from the apron to the platen, G; and as this operation of replacing the bottle is being performed, the plunger rises, actuates the rod, M, lever L and feed slide to place a new cork in position below the plunger by the time the uncorked bottle is brought by the carrier E from the apron to the platen, G, when the operations are repeated.

The corks are automatically supplied by the cork feed mechanism to the slide J, and the bottles are prevented from being thrown off the apron H or the carrier E by the guard rails 55, shown in Fig. 3.

I am aware that changes in the form and proportion of parts and in the details of construction of the several mechanisms herein shown and described as an embodiment of my invention can be made without departing from the spirit or sacrificing the advantages of my invention and I therefore reserve the right to make such modifications and alterations as fairly fall within the scope of my invention.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a bottle corking machine the combination with a bottle-bed, and a plunger reciprocating in line with said bed, of a yielding cork tube in line with the plunger and constructed to compress a cork within said cork-tube as it is forced through the same by the plunger, whereby the cork-tube is adapted to be carried down a limited distance with the plunger and the cork and to fit over the mouth of the bottle, substantially as and for the purposes described.

2. In a bottle corking machine, the combination with a bottle-bed, and a plunger, of a movable cork-tube provided with a flared mouth at one end to receive the neck of a bottle, and tension devices which yieldingly sustain the cork tube and permit it to move a limited distance on one stroke of the plunger and to return said cork tube to its initial position on the reverse stroke of said plunger, substantially as and for the purposes described.

3. In a bottle corking machine, the combination with a cork tube, a plunger, and a feed mechanism for carrying the corks to said cork-tube, of a conveyer, a yielding bottle-bed or platen situated at one side of the conveyer and in line with said cork tube and plunger, and devices for shifting a bottle from the conveyer onto the bottle-bed or platen, substantially as and for the purposes described.

4. In a bottle corking machine, the combination with a cork-tube and a plunger, of a table having an opening therein, a yielding platen or bed fitted in said table in line with said plunger, a lever having a rod or stem which is connected to said platen or bed and provided with an adjustable weight, a conveyer arranged at one side of said platen or bed, and means for shifting a bottle from the conveyer, upon the platen or bed, and thence back to said conveyer, substantially as and for the purposes described.

5. In a bottle corking machine, the combination with a plunger, a cork-tube, and a feed mechanism, of an endless conveyer at one side of the cork-tube and plunger and a horizontally movable carrier operated with a step-by-step motion to transfer the bottle from the conveyer to a position in line with the plunger and cork-tube, substantially as and for the purposes described.

6. In a bottle corking machine, the combination with a plunger, a cork-tube, and a feed mechanism for supplying corks to the cork-tube, of an endless bottle-conveyer, a bottle-carrier supported to rotate in a horizontal plane and transfer the bottles from said conveyer to a position below the cork tube and plunger, and a drive mechanism for rotating the bottle-carrier with a step-by-step motion,

substantially as and for the purposes described.

7. In a bottle corking machine, the combination with a plunger, a cork-tube, and a cork feed mechanism, of a continuous endless bottle-carrier passing at one side of the cork tube and plunger, a vertical shaft provided with a carrier-disk having radial bottle-seats, and a step-by-step drive mechanism for driving the shaft and bottle carrier to transfer each bottle successively from the carrier, to a position in line with the cork tube and plunger, and back again to the off-bearing side of said carrier, substantially as and for the purposes described.

8. In a bottle corking machine, the combination with a cork tube, and a reciprocating plunger provided with a cross head or projection, of a spring-controlled feed slide guided across the path of the plunger and the cork-tube, a lever L connected to said feed-slide, and a trip linked to said lever and guided to lie normally in the path of said cross-head or projection on the reciprocating plunger, substantially as and for the purposes described.

9. In a bottle corking machine, the combination of a table, a cork-tube, a feed-slide guided in a horizontal way, a spring for retracting the feed slide, a bell-crank lever connected to the feed slide, and a vertically guided stem linked to the bell crank lever and having a projection arranged in the path of a cross head on said plunger, substantially as and for the purposes described.

10. In a bottle corking machine, the combition of a table having a horizontal guide-way, a cork-guide tube suspended from said table at one end of said guide way, a cork-feed tube at one side of the cork-guide tube, a feed-slide fitted in said guide way between the two tubes and provided at one end with the cork grasping jaws, a reciprocating plunger, a lever L connected to said feed-slide, and a stem connected with the lever and provided with a projection arranged in the path of the plunger, for the purposes described, substantially as set forth.

11. In a bottle corking machine, the combination of an elevated cork-hopper, a primary hopper, an elevator operating in the primary hopper to receive the corks therefrom and deliver the same to the elevated hopper, a cork-tube below the elevated hopper, a feed tube leading from said elevated hopper, a feed slide between the feed tube and cork tube, a plunger, and connections between the plunger and feed slide to actuate the latter, substantially as and for the purposes described.

12. In a bottle corking machine, the combination with a cork-tube, a plunger, and a feed slide, of an elevated cork hopper provided with a pendent feed tube which discharges the corks to said feed-slide, a primary hopper situated below said elevated hopper, an endless elevator between the primary and elevated hoppers, a vibrating agitator hung within the primary hopper in the path of the buckets on said endless elevator, and an overhead driving mechanism for actuating the plunger and the endless elevator, substantially as and for the purposes described.

13. In a bottle corking machine, the combination with a cork-guide tube, a plunger, and a feed slide, of a feed tube arranged to deliver the corks one at a time to said feed-slide, a reciprocating hopper movable to and from the feed slide and having a cork-way between which the corks are to be suspended, detents operating synchronously with the hopper to move the corks along its guide way, and means for supplying corks to the hopper, substantially as and for the purposes described.

14. The combination with a feed tube, of a reciprocating hopper and cork-way plates supported over the feed tube, a detent to withdraw a cork from said hopper and move it between the cork-way plates, a swinging cork-plate adapted to detain a cork from moving with said cork-way plates as the hopper moves away from the said cork plate, a locking mechanism to hold the detent and swinging cork way plates in elevated positions during the movement of the hopper in one direction, and devices to depress said detent and swinging cork plate, substantially as described.

15. The combination with a feed tube, of a reciprocating hopper carrying the cork-way at one end thereof, the detent arranged between the cork-way, the swinging cork-plate, connections between said detent and cork plate, a locking means to hold the detent and cork plate in their raised positions, and means to depress the cork plate and detent, substantially as described.

16. In a bottle corking machine, the combination of a yieldingly supported cork tube, a movable platen or bed in line with said cork tube and normally pressed toward the same by a weighted lever, an intermittently rotated bottle carrier situated between said cork tube and the platen or bed, and a plunger, substantially as and for the purposes described.

17. In a bottle corking machine, the combination of a cork guide tube, D, a plunger C, and cork feed devices to supply corks one at a time to said tube D, of an automatic gas-supply valve 46 supported above the cork-tube and having a pipe connection therewith, and means carried by the plunger to momentarily open the valve as the plunger descends to force the cork through said tube D, into the bottle, whereby the valve is only opened as the plunger descends and admits a limited volume of gas to the bottle just prior to the entrance of the cork in the mouth of said bottle, as set forth.

18. In a bottle corking machine, the combination of a yielding cork-tube having a gas orifice within its flared mouth, a plunger, an automatic valve supported by fixed devices adjacent to the plunger and having means arranged in the path of a projection on the

plunger to be operated thereby as the plunger descends, the flexible pipe between the valve and the gas-orifice in the cork-tube, and a supply pipe to said valve, substantially as described.

19. In a bottle corking machine, the combination with a cork tube, a plunger, and a bottle platen or bed, of a gas-supply pipe connected to the cork tube, a self-closing valve held in a fixed support above the cork tube and having an arm, and a yielding tappet carried by the plunger and adapted to open the valve on the downstroke of the plunger, substantially as and for the purposes described.

In testimony whereof I affix my signature in presence of two witnesses.

SAML. B. SMALLWOOD.

Witnesses:
W. M. SMALLWOOD,
CHAS. W. HALLETT.