

(No Model.)

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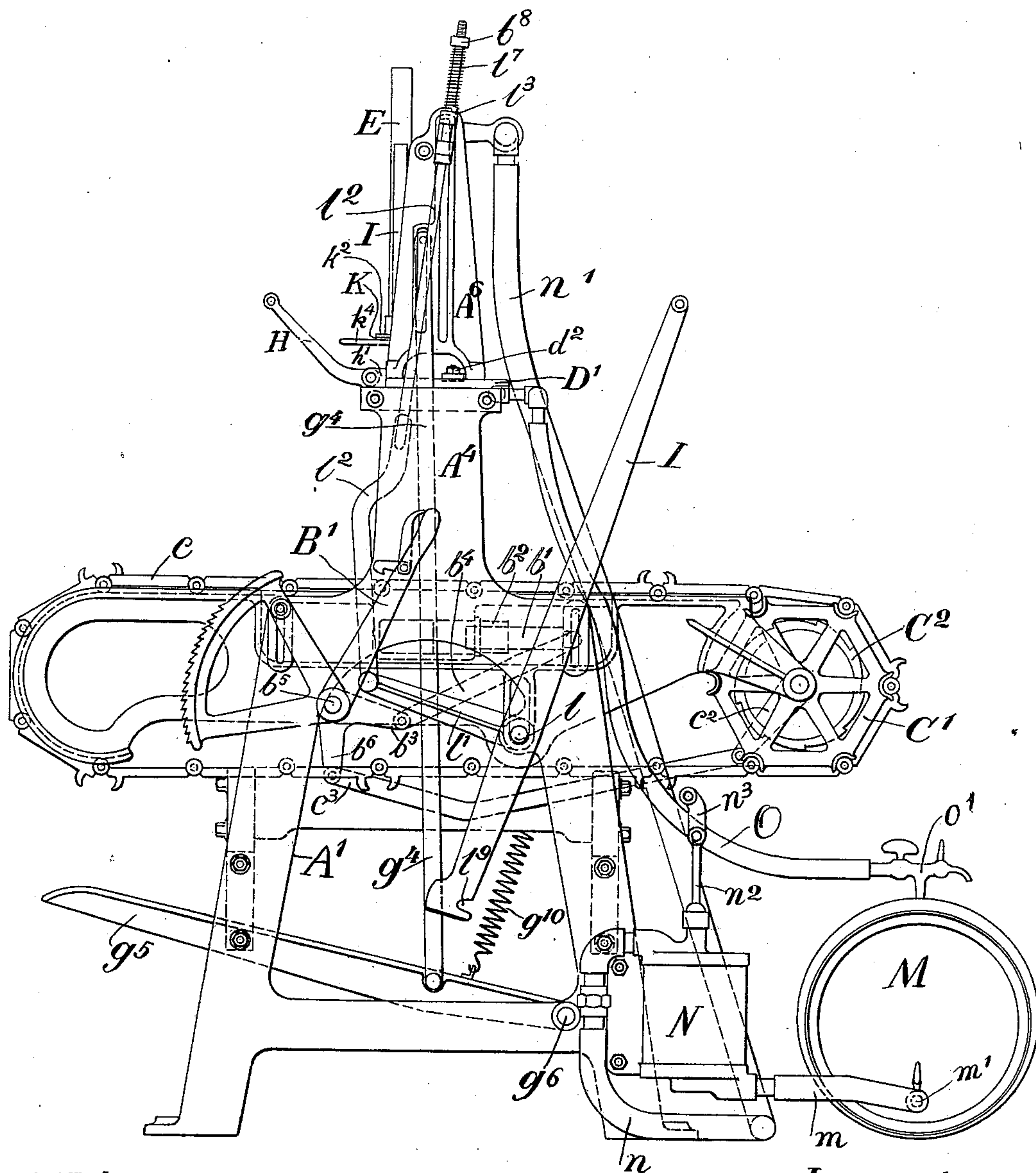
W. M. FOWLER.

MACHINE FOR FILLING AND CORKING BOTTLES.

No. 606,005.

Patented June 21, 1898.

Fig. 1.



Witnesses

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George Barry Jr.

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(No Model.)

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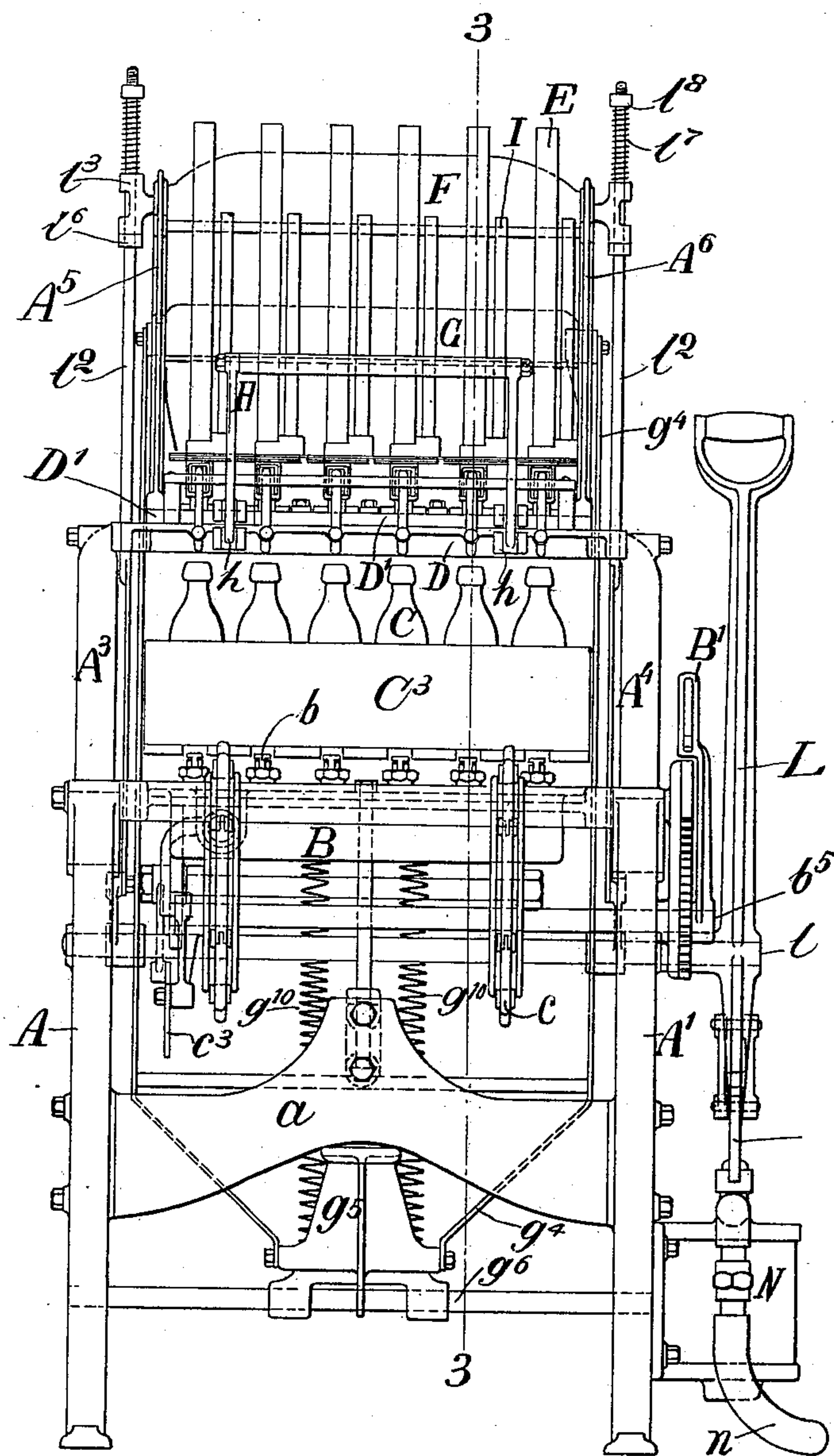
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Fig. 2.



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(No Model.)

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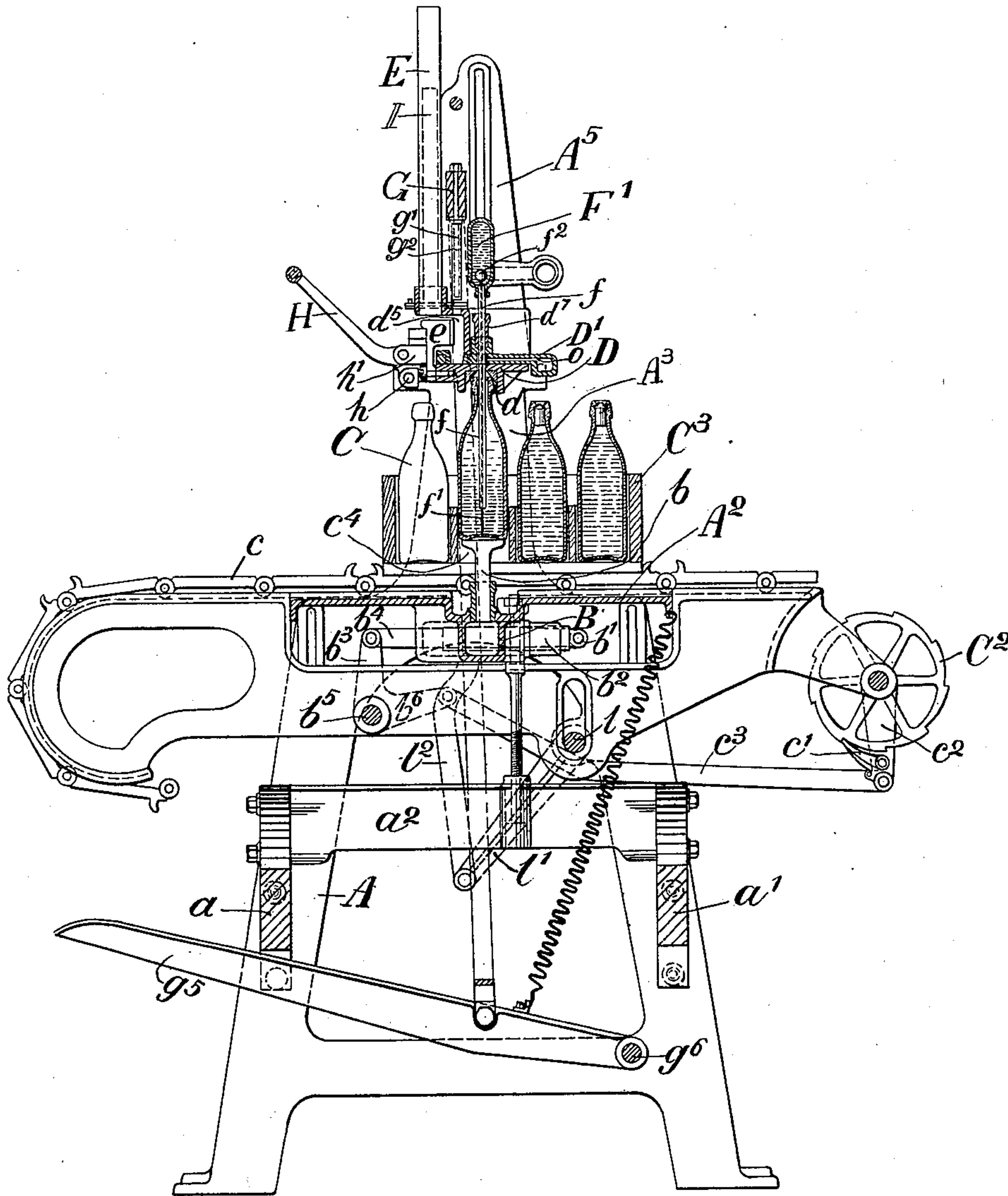
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Fig. 3.



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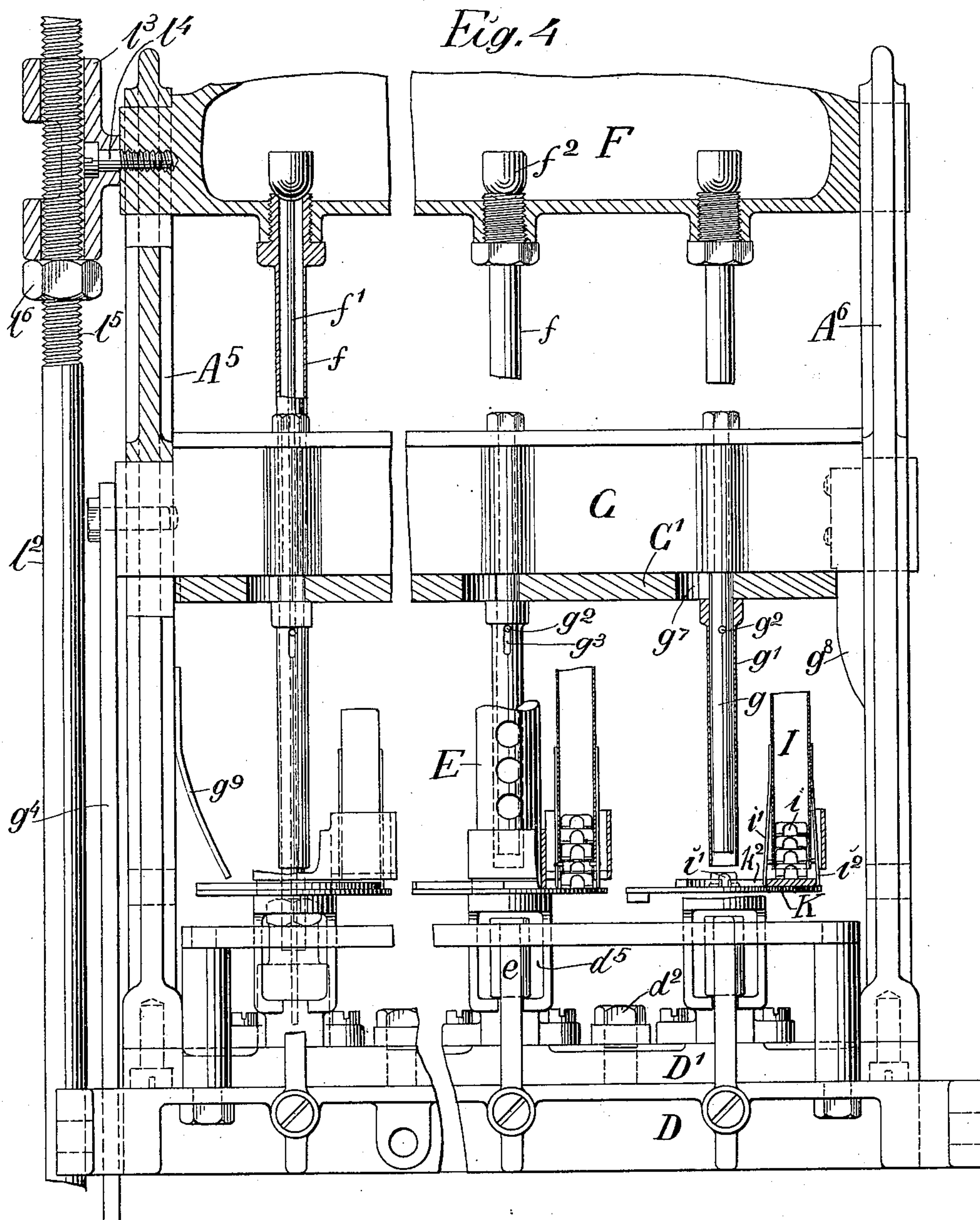
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6 Sheets—Sheet 4.

MACHINE FOR FILLING AND CORKING BOTTLES.

Patented June 21, 1898.



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6 Sheets—Sheet 5.

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MACHINE FOR FILLING AND CORKING BOTTLES.

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Fig. 12

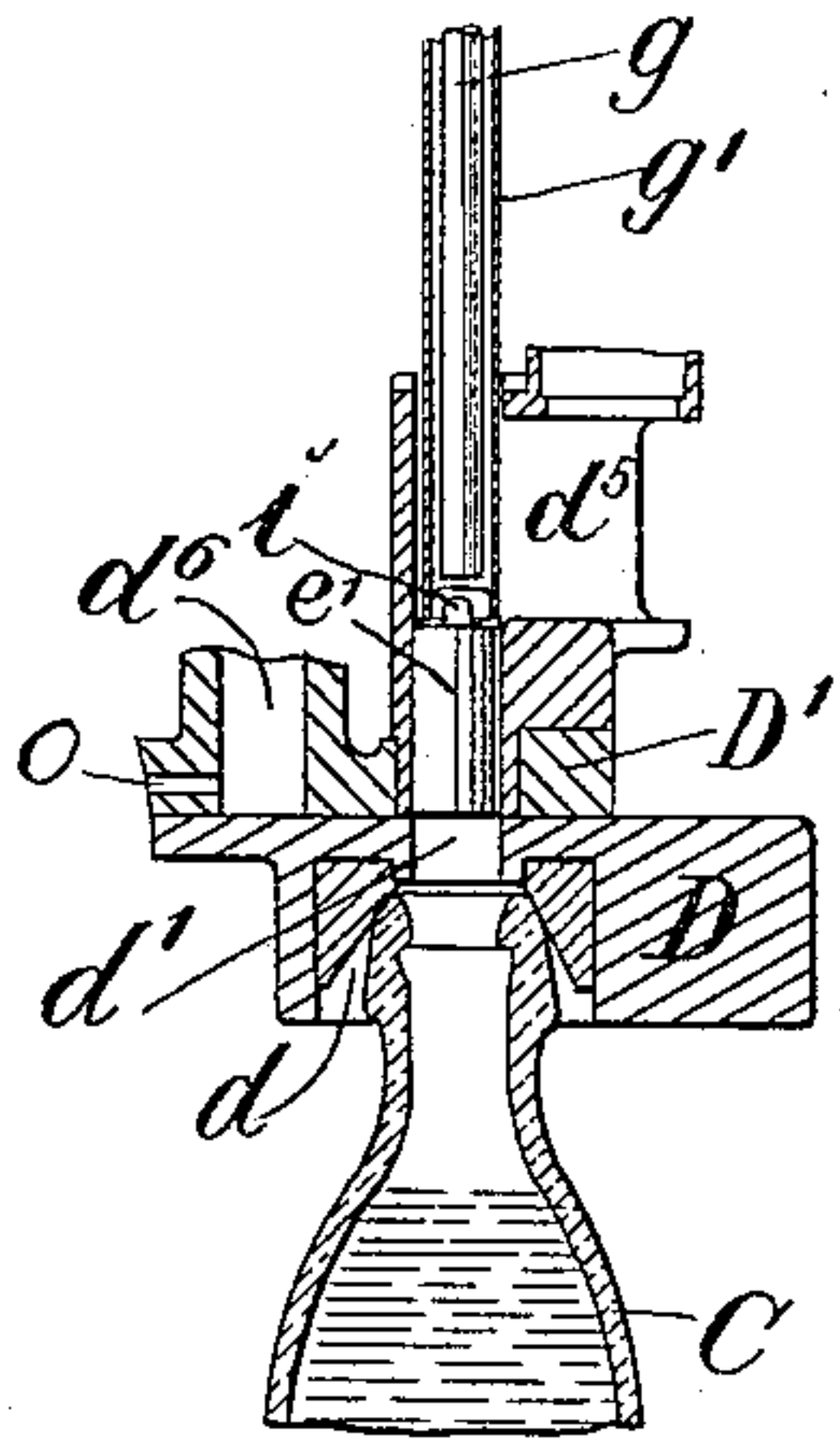


Fig. 14

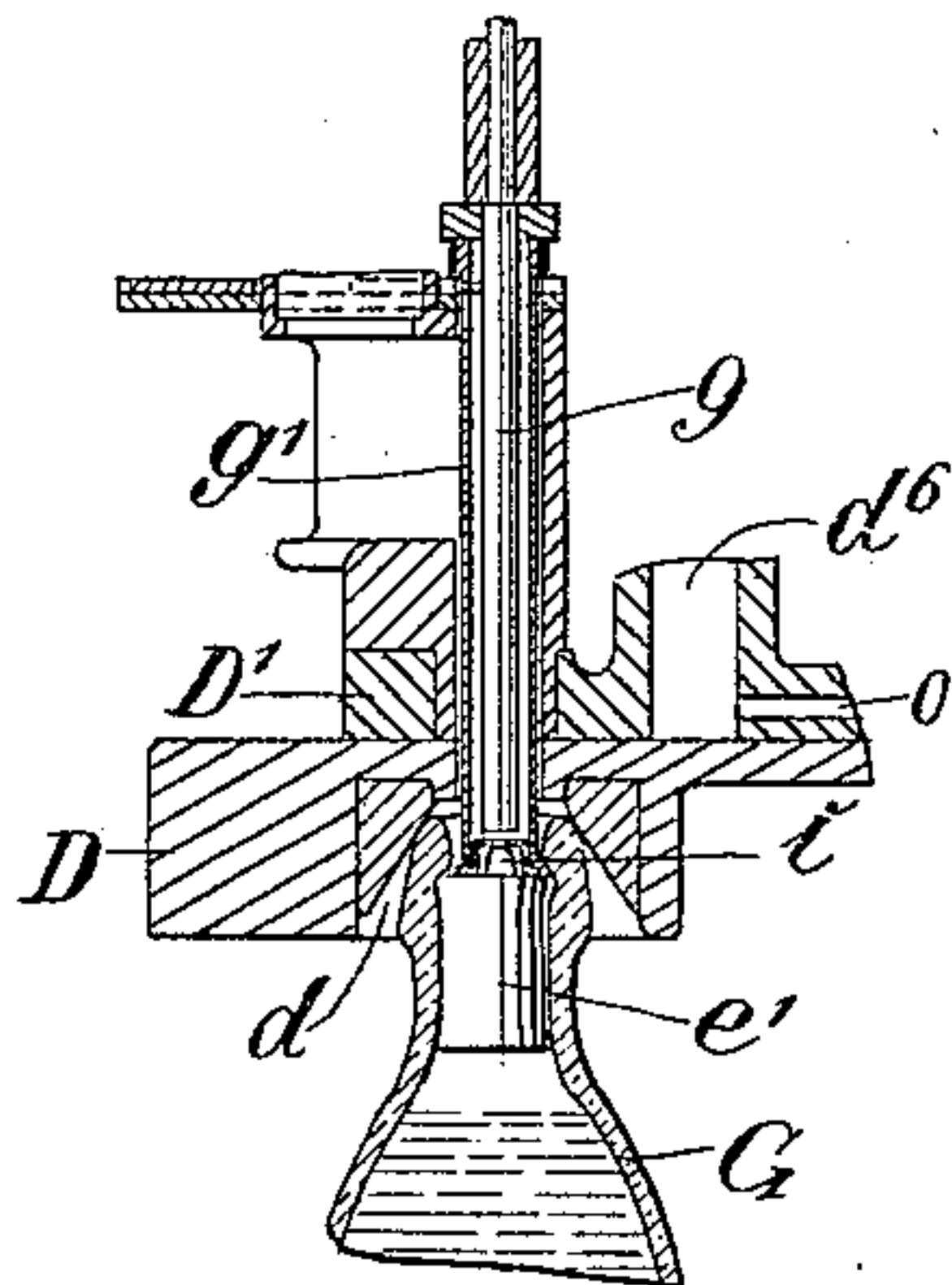


Fig. 13.

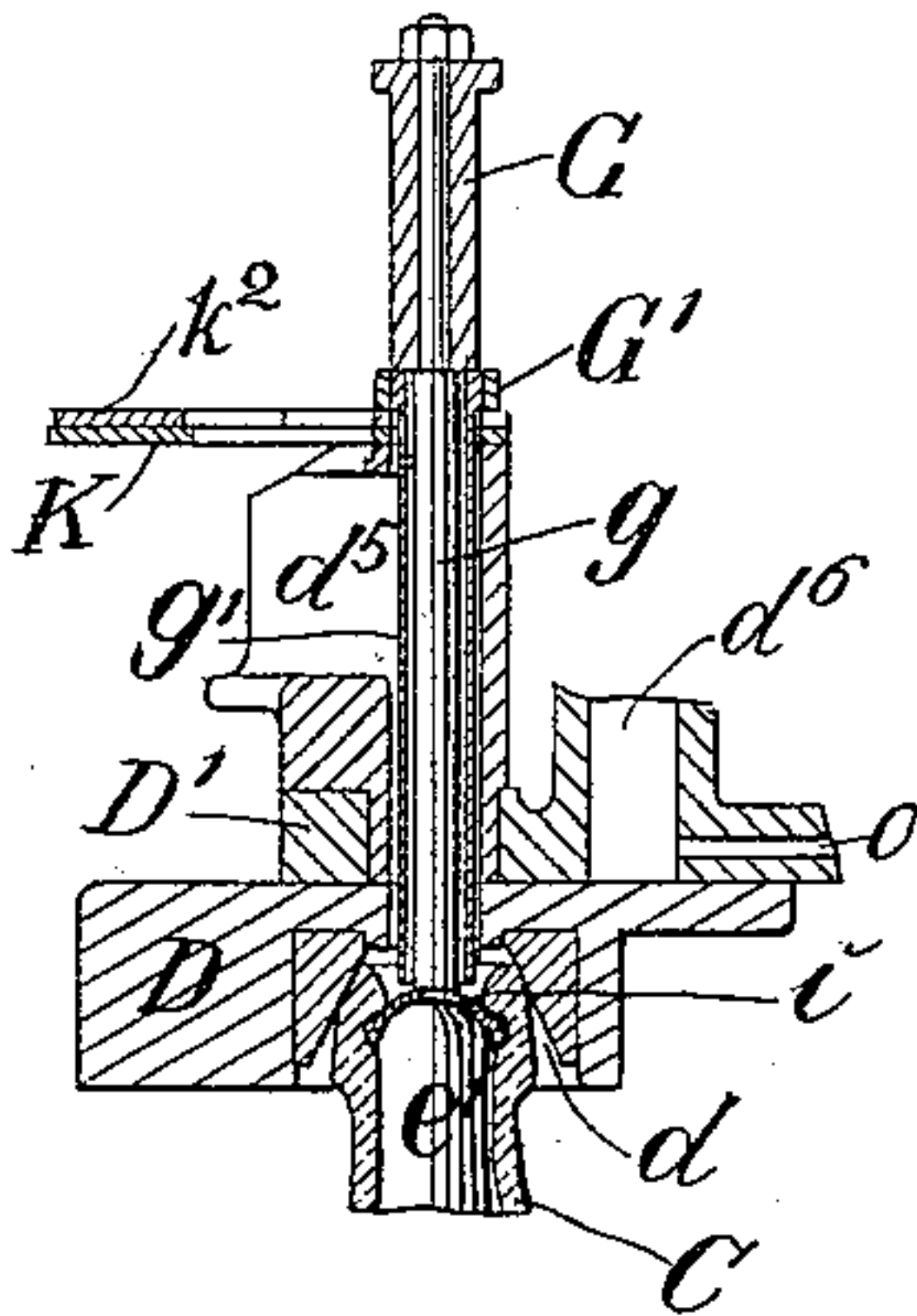


Fig. 5.

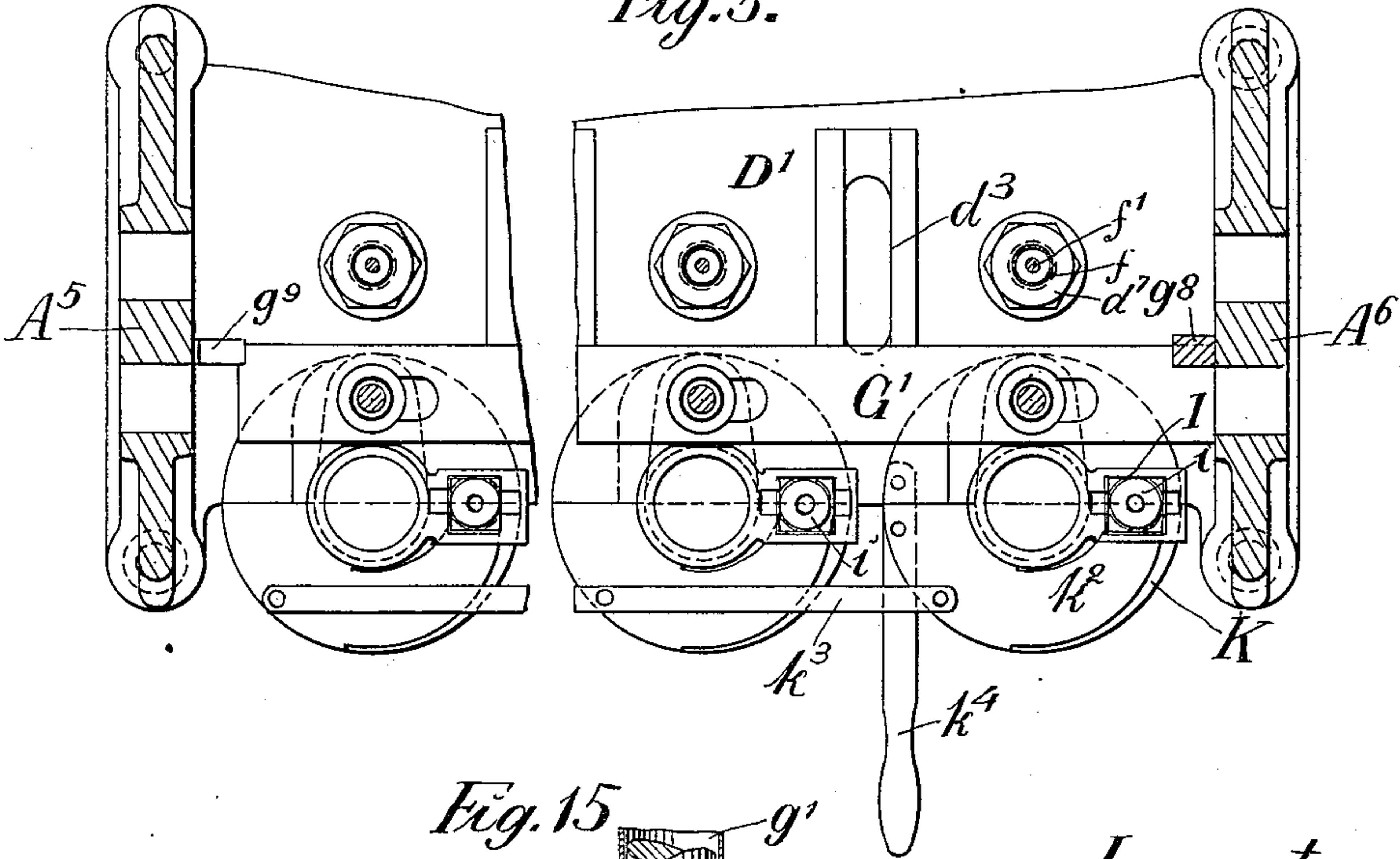
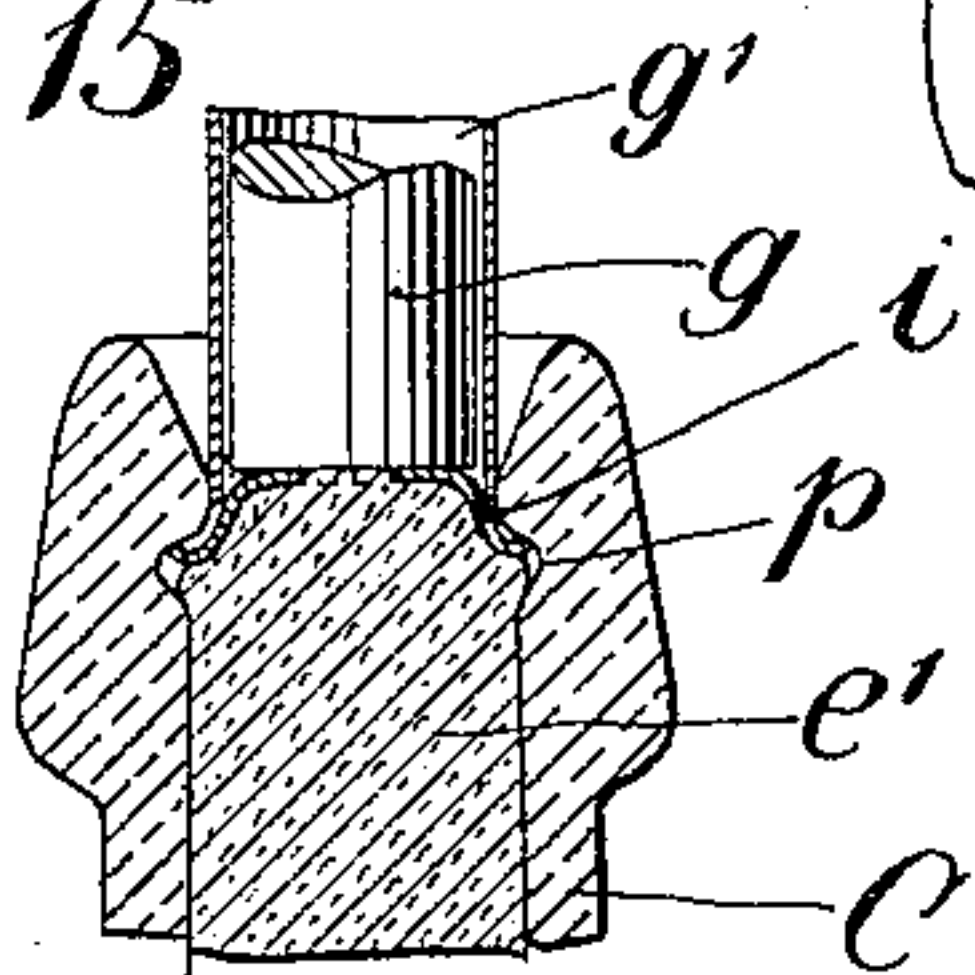


Fig. 15



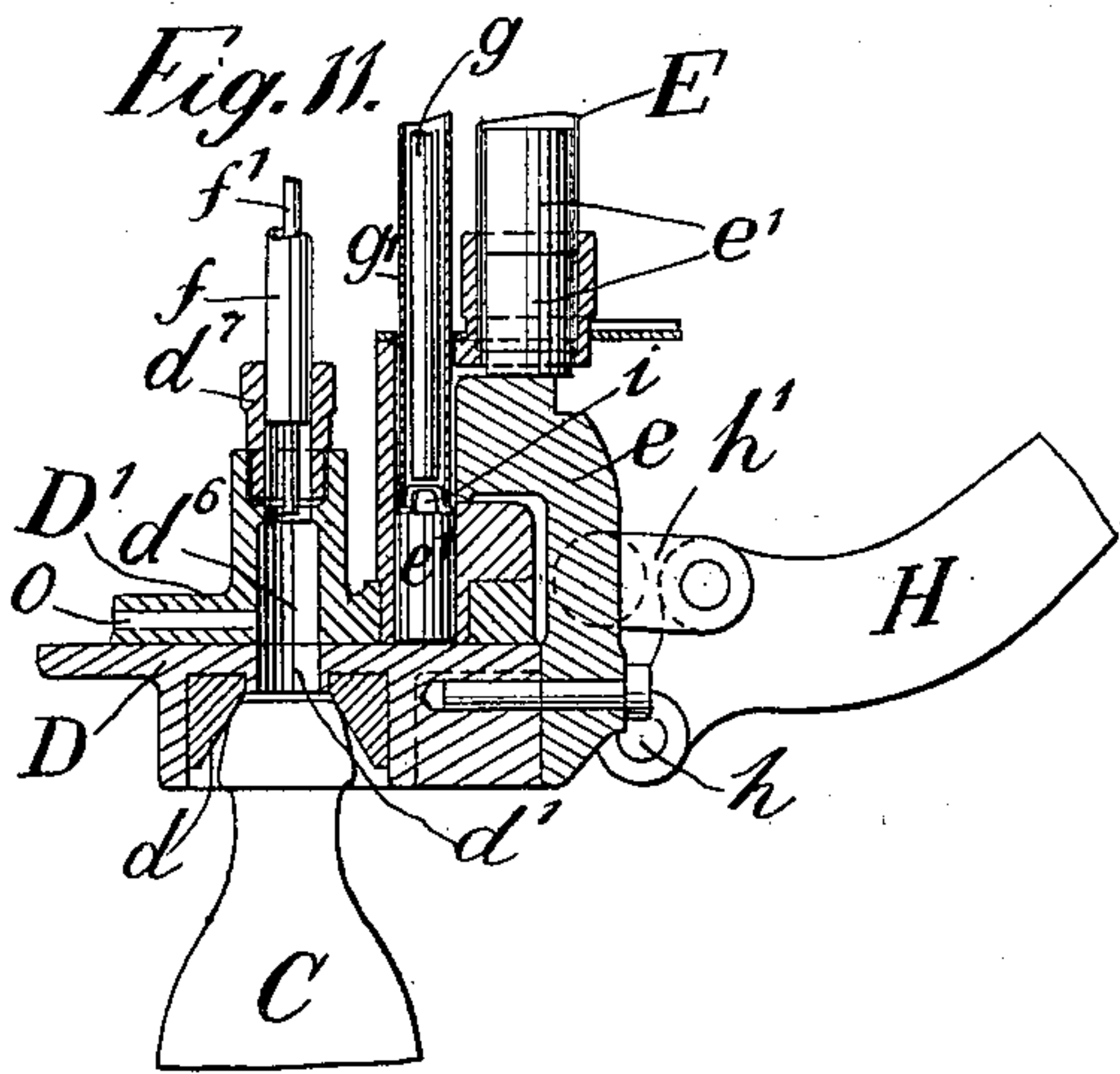
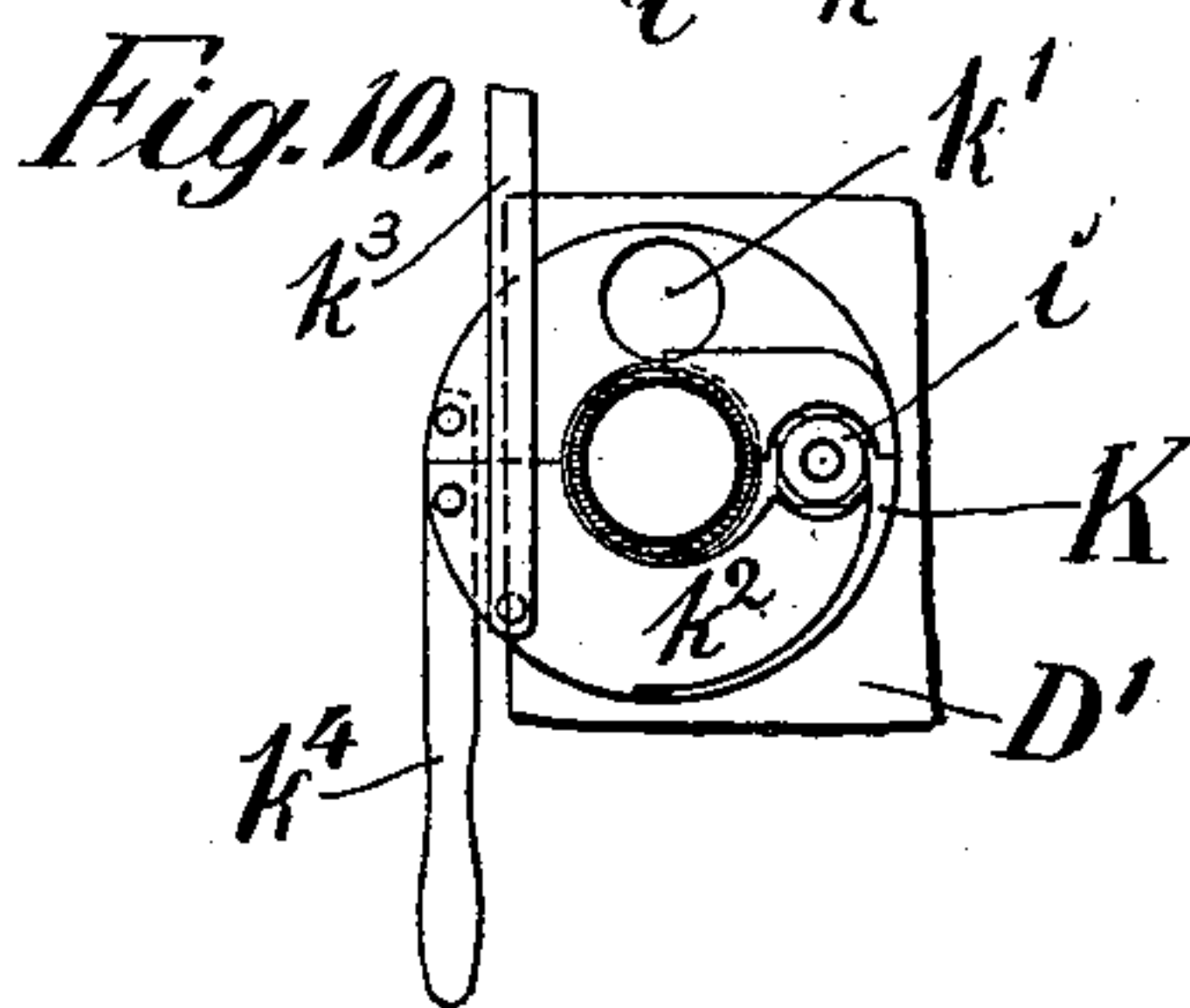
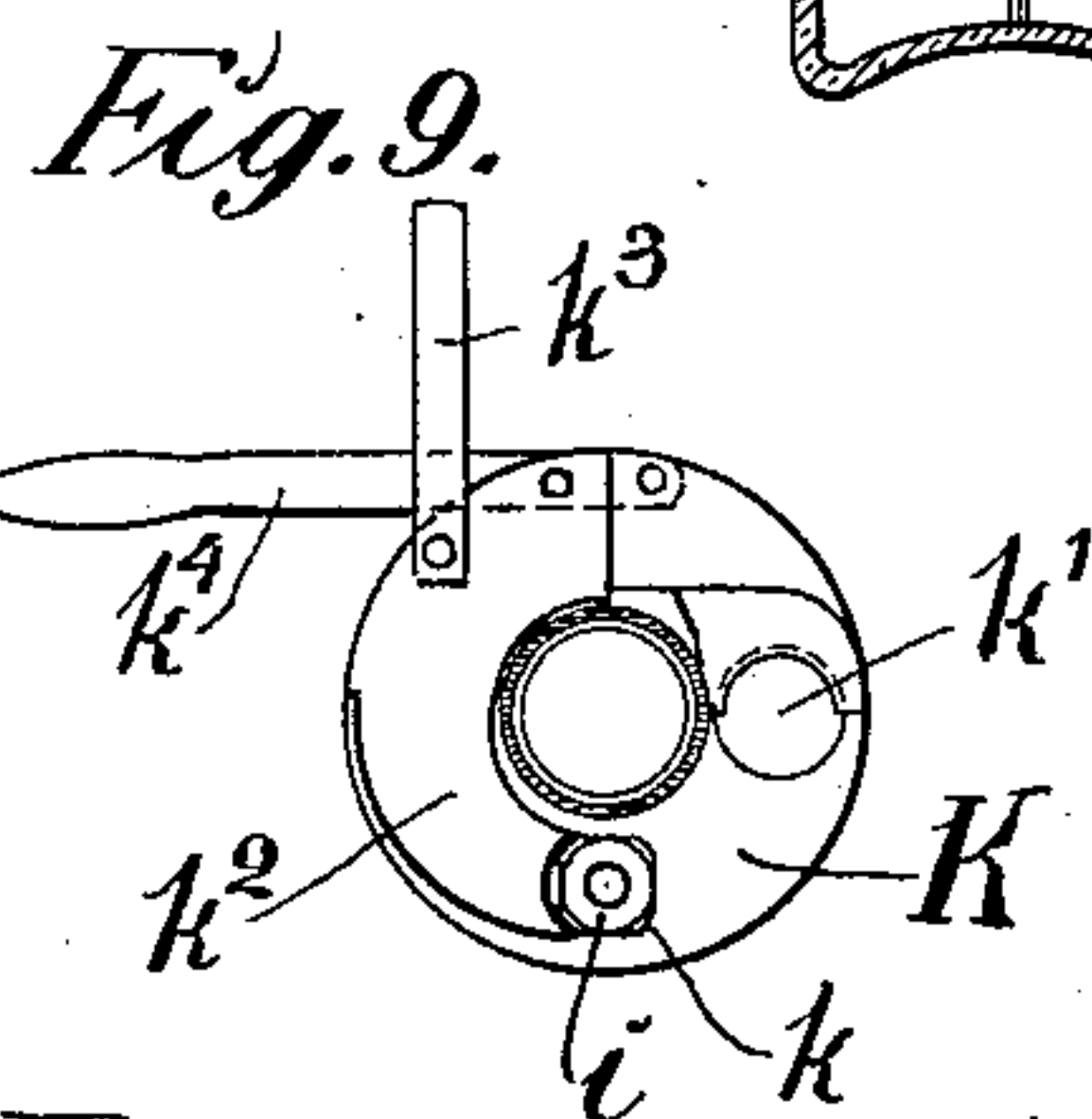
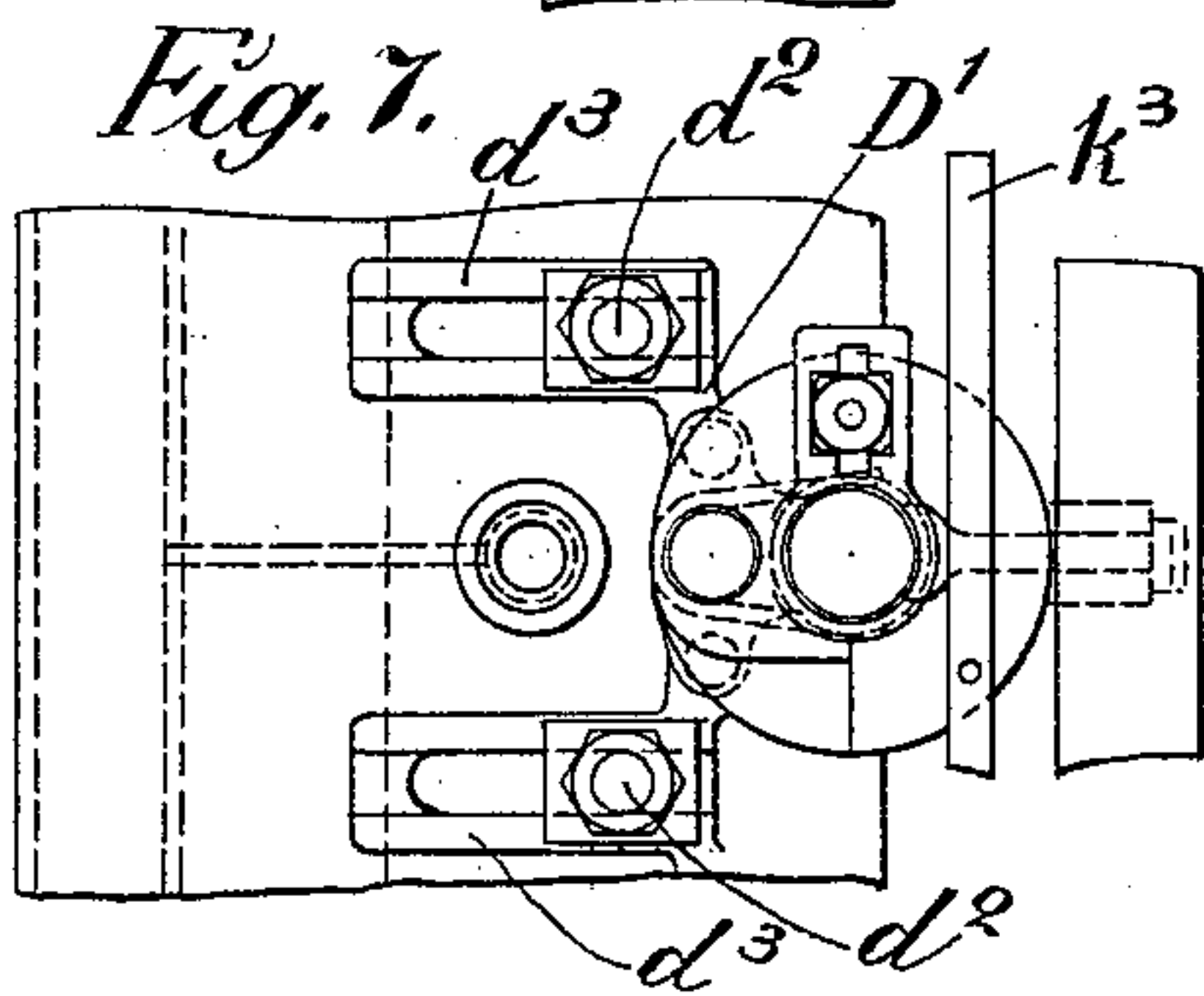
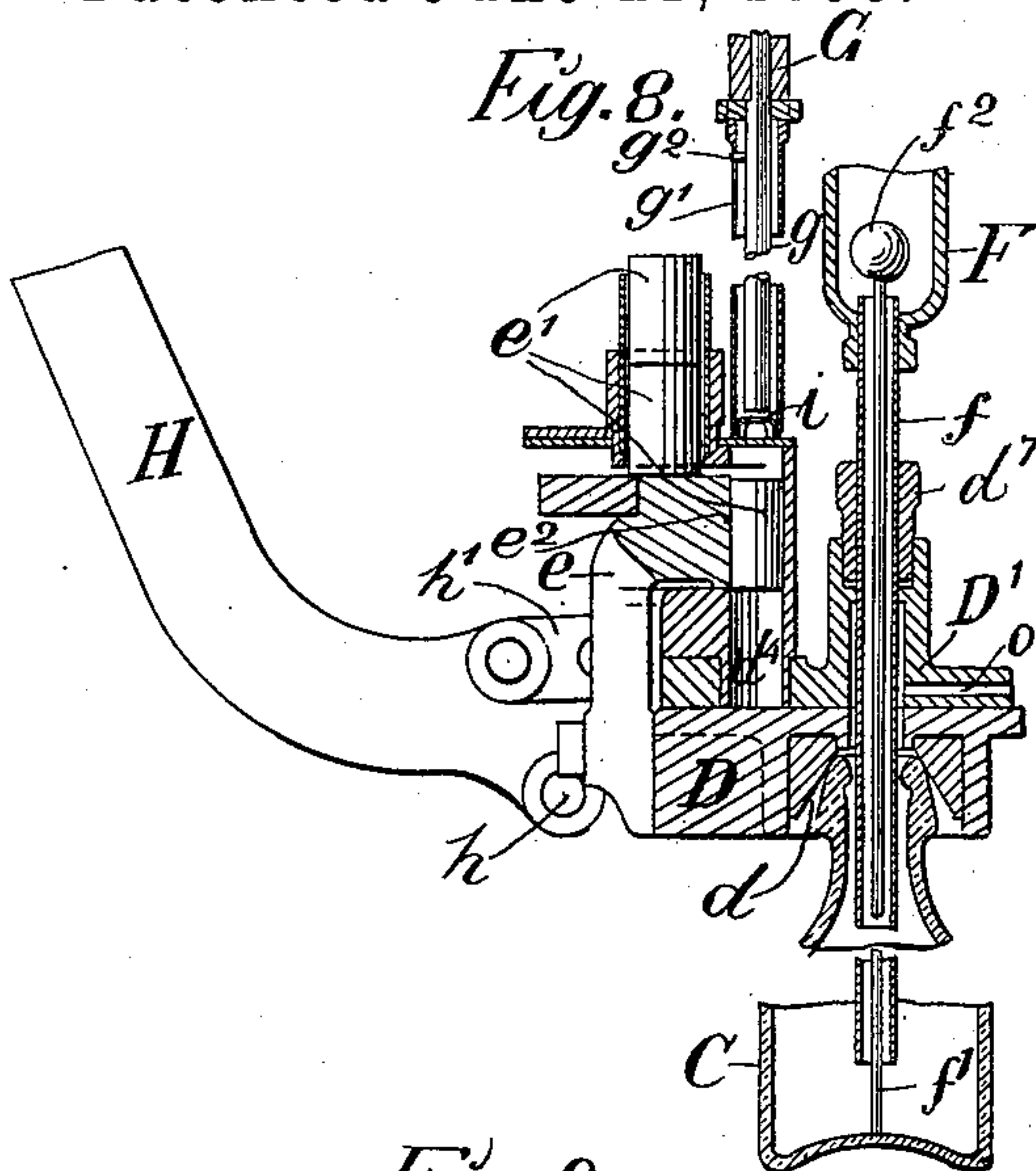
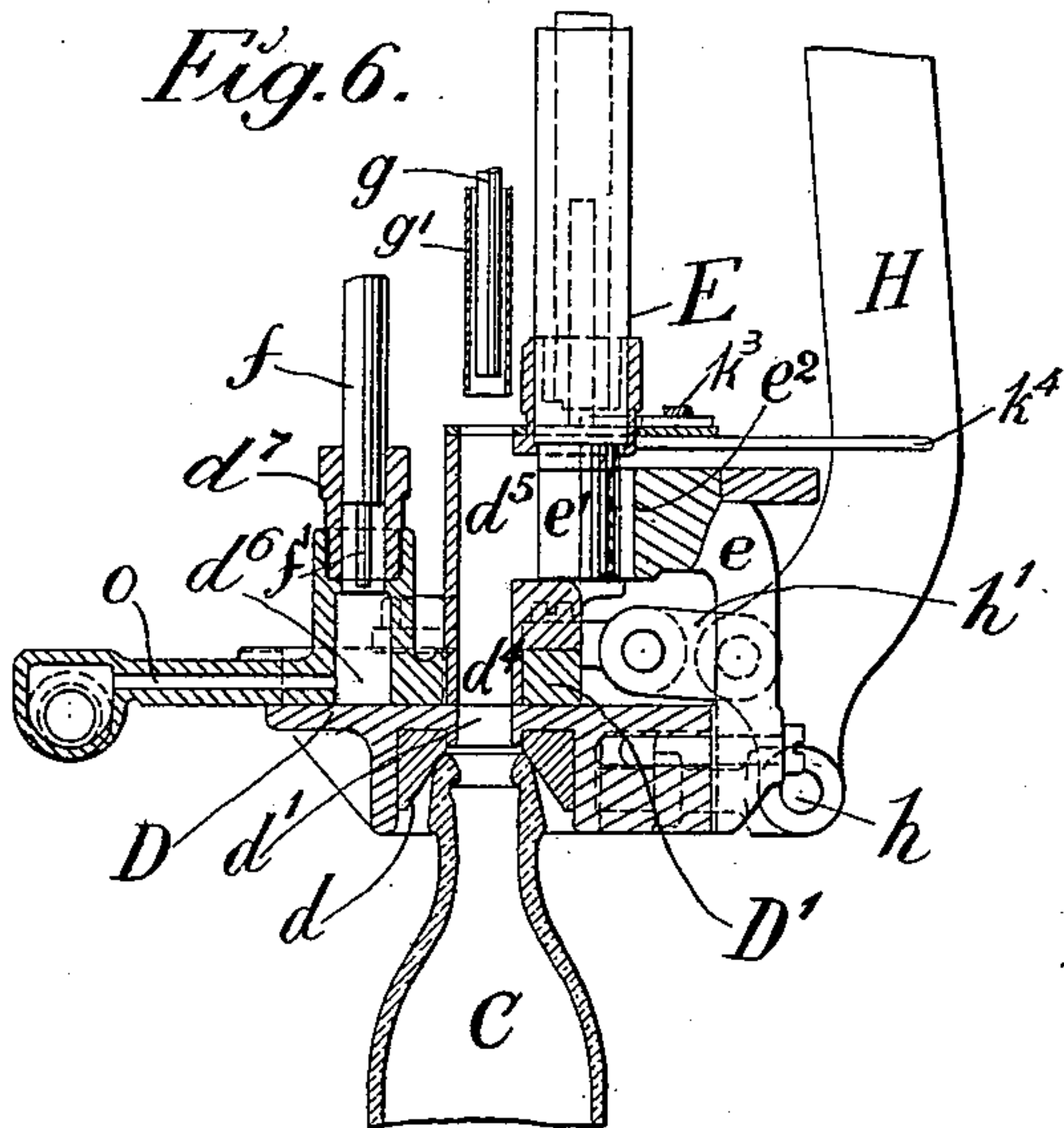
Witnesses:
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6 Sheets—Sheet 6.

MACHINE FOR FILLING AND CORKING BOTTLES.

Patented June 21, 1898.



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UNITED STATES PATENT OFFICE.

WILLIAM MILES FOWLER, OF STAMFORD, CONNECTICUT.

MACHINE FOR FILLING AND CORKING BOTTLES.

SPECIFICATION forming part of Letters Patent No. 606,005, dated June 21, 1898.

Application filed September 3, 1896. Serial No. 604,712. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM MILES FOWLER, of Stamford, in the county of Fairfield and State of Connecticut, have invented a new and useful Improvement in Machines for Filling and Corking Bottles, of which the following is a specification.

My invention relates to an improvement in machines for filling and corking bottles in which the contents of the bottle are prevented from access to the air intermediate of the filling and corking operations and in which provision is made for fastening the cork in its position in the neck of the bottle as one step of the operation of filling and corking.

In the accompanying drawings, Figure 1 represents the machine in side elevation. Fig. 2 represents the machine in front elevation. Fig. 3 represents a vertical section taken from front to rear in the plane of line 3 3 of Fig. 2. Fig. 4 is an enlarged view showing, partly in front elevation and partly in section, several of the filling and corking tubes and the parts in proximity thereto. Fig. 5 is an enlarged plan view in detail of several of the series of turn-tables or disks for transferring the cork-fasteners from the supply-reservoir to the corking-tubes. Fig. 6 is a sectional view in detail, showing the position of the parts in proximity to the mouth of the bottle at the first step of the operation. Fig. 7 is a top plan view of the same, the operating-lever and its connecting-link being omitted. Fig. 8 is a sectional view in detail, taken from the reverse side from that in which Fig. 6 is taken and showing the position which the parts assume when the cork is compressed and the filler in position to fill. Figs. 9 and 10 represent two positions of the turn-table in the positions which they assume in transferring a fastener into alinement with the corking-tube. Fig. 11 represents the position of the parts when the cork is driven into the cap-plate ready for insertion into the bottle. Figs. 12, 13, and 14 represent different stages in the operation of inserting the cork and fastener; and Fig. 15 is an enlarged view in detail, showing the position of the cork fastener and plunger at the moment of expanding the fastener.

The machine comprises means for raising a bank of bottles into air-tight contact with a

series of corresponding seats; means for compressing the corks which are to be inserted into the mouths of the bottles and at the same time moving the fillers into alinement with the bottles; means for transferring fasteners from their reservoirs to the corking-plungers above the corks which are to be inserted into the bottles and for causing the corking-plungers to pick up the said fasteners; means for forcing the corks with the fasteners thereon into sockets in the base-plate ready for insertion through the sealing-plate into the mouths of the bottles; means for inserting the fillers into the bottles, opening the valves, and forcing the liquid into the bottles to fill them; means for closing the valves, removing the fillers from the bottles, and shifting the corks in the cap-plate into alinement with the bottles; means for forcing and fastening the corks in the mouths of the bottles, and means for lowering the bottles from their sealing-plate, feeding them to the rear, and bringing a new bank of bottles into position to be lifted toward their sealing-plate, the above brief summary of the several parts of the machine being recited in the order in which the several steps of operation occur and which order will be, for the sake of clearness, observed as far as is practicable in hereinafter explaining more particularly the structure of the several parts.

The main frame of the machine consists of a pair of side frames A A', made as light as is consistent with the necessary strength and connected at the top of the base portion by a table or head-plate A² and intermediate of the table or head-plate and the foot by girders a a'. The girders a a' are connected at their middle portions by a tie-beam a². The side frames A A' extend upwardly from the table or head-plate, forming pedestals A³ A⁴ for the reception of the standards A⁵ A⁶ for supporting the fillers and their supply-reservoir, the corking mechanism, and the parts which immediately coöperate therewith.

A reservoir B (see Fig. 3) is located transversely of the machine just below the table or head-plate A² and has communicating with its upper side a series of plungers b, one for each of a bank of bottles which may be presented above them. The reservoir B is made liquid-tight, and the liquid therein is dis-

placed to force the plungers b upwardly by means of a piston b' , which works in a cylinder b^2 in communication with the reservoir B and which is forced into the cylinder by means of a lever-arm connected with the piston by a rod b^4 . The lever-arm b^3 is fulcrumed at b^5 and operated by a lever B' , connected to rock therewith and within convenient reach of the operator at the front of the machine.

The bottles C are conveyed in banks of six, more or less—in the present instance in banks of six—to positions over the plungers b by means of an endless belt or chain c , which is driven step by step by the action of a spring-actuated pawl c' , carried by a swinging arm c^2 , mounted concentric with a sprocket-wheel C' , on which the endless chain or belt is mounted, the said pawl being adapted to engage the teeth on a ratchet-wheel C^2 , mounted to rotate with the sprocket-wheel. The arm c^2 is swung into position to carry the pawl c' into engagement with an advance tooth simultaneously with the operation of the piston b' to lift the plungers b . This is accomplished by connecting the arm c^2 by a rod c^3 with a lever-arm b^6 , fixed to rock with the lever-arm b^3 and set in the present instance at an angle thereto.

The bottles are conveniently set in a box C^3 , having subdivisions c^4 for holding the bottles in position and having its bottom provided with openings beneath the bottoms of the bottles to permit the plungers b to pass up through to lift the bottles.

At the top of the pedestals A^3 A^4 there is fixed what I am pleased to term a "sealing-plate" D, provided on its under side with cushioned pockets d for the reception of the nozzles of the bottles at points opposite openings d' through the sealing-plate.

The position of the parts at the end of the step which brings the bottles up into contact with the sealing-plate and the feed-pawl into position to feed is shown in Fig. 3, so far as the bottle lifting and feeding mechanism is concerned, and in the detail drawing, Fig. 6, so far as the parts above the sealing-plate and in immediate proximity thereto are concerned.

The next step includes compressing the corks which are to be inserted into the mouths of the bottles after they are filled and simultaneously therewith swinging the fillers into alinement with the bottles. The mechanism for accomplishing these results is constructed and arranged as follows:

The supporting-standards A^5 A^6 , hereinabove referred to, are fixed to move bodily forward and backward a limited distance, together with a base-plate D' , which rests liquid-tight on the top of the sealing-plate D and is guided in its forward-and-backward movement by means of screw-studs d^2 , which pass through slotted guides d^3 , extending rearwardly from the base-plate D' into the sealing-plate D. (See Fig. 7.) The base-plate D' is provided with a series of sockets d^4 for

the reception of the compressed corks, said sockets d^4 terminating at their upper ends in a broader chambered portion d^5 for the reception of the uncompressed cork from the cork-supply device E, supported in fixed position from the sealing-plate D by bracket-arms e . The base-plate D' also is provided with a series of sockets d^6 , through which the fillers f , which depend from the supply-reservoir F, pass in entering the mouths of the bottles. In the present instance the fillers themselves are held in position in alinement with the sockets d^6 by tubular guides d^7 , screwed into the tops of the walls of the sockets. (See Fig. 6.) A series of cork-driving plungers, each comprising a central driving-rod g , fixed to a cross-head G, mounted in vertically-reciprocating adjustment in the standards A^5 A^6 , and a sleeve g' , surrounding the lower portions of the driving-rods g and attached thereto with a limited vertical movement—in the present instance by means of studs g^2 , extending from the driving-rod g through elongated slots g^3 in the sleeve—are arranged to pass downwardly through the sockets d^4 to force the cork and the fastener on the cork into the mouth of the bottle when the latter has been filled. The particular means for operating the plungers for driving the cork will be hereinafter described.

The forwardly and backwardly reciprocating base-plate, with the fillers and plungers fixed to move therewith, is operated to bring either the cork-receiving sockets d^4 or the filler-receiving sockets d^6 in alinement with the mouth of the bottle at pleasure by means of a hand-lever H, fulcrumed at h at points preferably equidistant from the opposite ends of the sealing-plate D, as shown in Fig. 2, a connection intermediate of its handle and its fulcrum with the sliding base-plate D' by means of a link h' .

When the parts are in the position shown in detail in Fig. 6, a cork e' has been fed from the cork-reservoir E down into the enlarged chamber d^5 at the top of the socket d^4 , the front wall of said chamber (denoted by e^2) being fixed relative to the movement of the sliding base-plate D' , so that when the lever H is depressed to draw the sliding plate D' over into the position shown in Figs. 8 and 11 to bring the fillers f and the sockets d^6 for receiving them into alinement with the mouth of the bottle the rear wall of the chamber d^5 will have engaged the cork e' and pressed it between it and the stationary front wall e^2 into a compass sufficiently restricted to enable it to be inserted in the socket d^4 , ready for insertion into the mouth of the bottle. This completes the second step in the operation—viz., simultaneously compressing the corks and moving the fillers into alinement with the bottles.

The third step consists in transferring the fasteners from their reservoirs to positions beneath the ends of the corking-plungers above the corks which are to be inserted into the

bottles and causing the sleeves of said corking-plungers to pick up the said fasteners. The mechanism for accomplishing this step is constructed and arranged as follows:

5 A series of tubular reservoirs I, one for each filler, are supported at the side of the cork-reservoirs E by the same supports *e* which support the cork-reservoirs, and the fasteners *i*, each consisting of a U-shaped body with
10 outwardly-turned projections at the ends of their branches, are supplied to the reservoirs I in vertical series, as shown in Fig. 4. At the bottom of each reservoir I there are spring-jaws *i'* *i''*, which when spread apart permit the
15 lowermost of the fasteners *i* to be removed from the bottom of the reservoir I, while by the closing of the jaws after the lowermost fastener has been removed the remaining fasteners will be held against escape.

20 Intermediate of the lower ends of the cork and fastener reservoirs and the top of the movable base-plate D' there are mounted a series of turn-tables K, one for each reservoir. These turn-tables K have their axes of
25 rotation in vertical alinement with the axes of the cork-reservoirs and are each provided with a pocket *k* for the reception of one of the fasteners and an opening *k'* for permitting the cork-driving plunger to pass down through into the socket in the reciprocating
30 plate D' to drive the cork. Each of these turn-tables K is further provided with a curved wedge-shaped tongue *k''*, (see Figs. 4, 9, and 10,) rising a short distance above its
35 surface, which as the turn-table is rotated to carry a fastener *i*, which has been received from the reservoir I, in the pocket *k* around into position over the top of the compressed cork, as represented in Fig. 8, gradually separates the spring-jaws *i'* *i''* and permits the
40 next following fastener *i* to drop and rest on the smooth upper surface of the tongue *k''*, as shown in Fig. 4. As the turn-table K is returned from the position shown in Fig. 10 back
45 to the position shown in Fig. 9 the fastener so resting upon the upper surface of the tongue *k''* will drop into the pocket *k* and be ready to be carried by the turn-table from the position shown in Fig. 9 to that shown in Fig. 10 at
50 the next operation of the turn-table.

The fastener, which has been carried by the turn-table into the position shown in Fig. 10 in alinement with the compressed cork, is picked up by the cork-driving plunger before
55 the turn-table K is returned to its normal position in the following manner: The cork-driving plungers, as hereinbefore stated, have their central driving-rods fixed to a cross-head G. The cross-head G is connected at
60 its opposite ends by rods *g*⁴ with a foot-treadle *g*⁵, fulcrumed to the supporting-frame at *g*⁶. Intermediate of the cross-head G, to which the central driving-rods *g* of the plungers are fixed, and the upper ends of the sleeves *g'*,
65 mounted on the lower portions of the driving-rods *g*, there is a laterally-movable plate G', (see Fig. 4,) provided with laterally-elongated

slots *g*⁷, through which the driving-rods *g* pass. The plate G' is normally held shifted laterally, as shown in Fig. 4, in position to form
70 an abutment for the upper ends of the sleeves *g'* and cause them to move together with the driving-rods *g*. As the cross-head G descends, carrying with it the intermediate plate G', a beveled bearing *g*⁸ at one end of the plate permits the plate to slide laterally a sufficient
75 distance to bring the slot *g*⁷ in the plate G in alinement with the top of the sleeve *g'*, thereby permitting the latter to slide upwardly on the rod *g* as the rods *g*, with their cross-head G,
80 complete their downward stroke. The plate G' is forced laterally by a spring *g*⁹, set at the opposite end of the plate from the beveled bearing *g*⁸, (see Fig. 4,) the action of said spring in sliding the plate G' laterally being
85 permitted by momentarily releasing the pressure from the foot-treadle *g*⁵ after the fasteners and corks have been driven into the bottle to the point where it is desired to expand the
90 fasteners to cause their edges to catch in grooves or sockets on the interior surface of the mouths of the bottles. The downward movement of the cork-driving plungers required to take up the fasteners which have
95 been carried into the position shown in Fig. 10 is, however, only slight, and to accomplish this the plate G' is not carried downwardly far enough to be shifted endwise, so that the rod *g* and its sleeve *g'* work as one fixed piece. The sleeve *g'* projects sufficiently far below
100 the end of the driving-rod *g* to permit a fastener *i* to seat in the lower end of the sleeve without obstruction from the lower end of the rod *g*, and the fastener is picked up from the turn-table K by simply pressing the plungers
105 downwardly onto the fasteners, crowding the U-shaped portions of the fasteners into the interiors of the lower ends of the sleeves *g'*, where they are retained by their frictional contact with the said sleeves. The foot is
110 then raised from the treadle *g*⁵, and the plungers, with the fasteners in their lower ends, are lifted from the turn-tables by the action of the retracting-springs *g*¹⁰. This having
115 been accomplished the turn-tables K, connected to move in unison by the connecting-bar *k*³, are returned to their normal positions (shown in Fig. 9) by means of the operating-handle *k*⁴, located within easy reach of the operator, and the third step in the operation is
120 completed.

The next step consists in forcing the compressed corks, with the fasteners thereon, into sockets in the base-plate ready for insertion through the sealing-plate into the mouths of
125 the bottles. This is accomplished as follows: When the turn-tables K are returned to their normal positions after carrying the fasteners to points beneath the corking-plungers, the openings *k'* in said tables are brought into
130 alinement with the sockets *d*⁵ *d*⁴ in the base-plate D. The cork at this moment rests in a compressed state in the socket *d*⁵, and the fastener is held in the lower end of the sleeve

g' of the corking-plunger. In the position shown in Fig. 8 the treadle g^5 , which was before operated to cause the corking-plunger to take up the fastener, is again depressed, causing the corking-plunger, with the fastener therein, to pass downwardly through the opening k' in the turn-table into engagement with the top of the compressed cork, and the latter, together with the fastener, is forced downwardly into the socket d^4 into the position shown in Fig. 11, the lower end of the cork resting upon the upper face of the sealing-plate D. While the corks with the fasteners thereon are held in this position, the filling operation takes place as follows: The filling-reservoir F, with the fillers f depending therefrom, is lowered, causing the fillers f to pass downwardly through the sockets d^6 and through the opening d in the sealing-plate into the mouths of the bottles, as shown in Fig. 8, until the valve-operating rod f' , extending downwardly through the filling-tubes f , engages the abutments of the bottles and lifts the valves f^2 from their seats in the filling-reservoir F to permit liquid to flow from the reservoir into the bottles. This downward movement of the filling-reservoir, with the fillers carried thereby, is effected by means of an operating-lever L, pivoted to the supporting-frame at l and provided with laterally-extending arms l' , the free ends of which are connected with the opposite ends of the reservoir F by rods l^2 . The manner of connecting the rods l^2 with the reservoir consists in providing a socket-piece l^3 , (see Fig. 4,) connected at one side with the end of the reservoir, in the present instance by means of a screw l^4 , the said socket-piece l^3 having a bar of sufficient size to permit a screw-threaded portion l^5 of the connecting-rod l^2 to slide through it, an adjusting-nut l^6 serving as a bearing for the socket-piece l^3 at the bottom and a spring l^7 (see Figs. 1 and 2) being inserted between the top of the socket-piece and a second adjusting-nut l^8 , screwed on the rod l^2 . This arrangement gives the fillers a yielding bearing when in their lowermost position, the tension being varied at pleasure by means of the adjusting-nuts on the connecting-rods. The operating-lever L, during its movement from the position shown in Fig. 1 to its position shown in Fig. 3 with the arms l' swung into position to lower the fillers into the bottles, performs, in addition to the lowering of the fillers and the opening of the valves for filling the bottles, the function of pumping the liquid from the cask into the bottle. The cask is represented in the present instance by M, and has a pipe m , which may be a flexible hose-pipe leading from a stop-cock m' in the end of the cask to a pump N, from which a delivery-pipe n connects with a hose n' , leading up to the reservoir F. An outlet-passage o (see Fig. 6) leads from the socket d in the base-plate to a hose O, connected with the top of the cask M by a cock o' . The lower end of the operating-lever L is provided with

a hook l^9 , which, after the lever L has moved a portion of its stroke sufficient to lower the fillers into the bottles and open the valves f^2 , engages the piston-rod n^2 of the pump N and operates the piston in the direction to lift the liquid into the reservoir F. The particular form of connection between the end of the lever L and the piston-rod is such that the return movement of the lever will force the piston-rod n^2 downwardly during the first part of the movement of the lever L, and as the lever L is further swung the latter will be automatically released from the piston-rod. This is accomplished in the following manner: To the upper end of the piston-rod n^2 there is attached a loop n^3 sufficient to receive within it the hook end of the operating-lever L, the latter being of such depth relatively to the loop n^3 that it will bear upon the lower end of the loop n^3 during the first part of the return movement of the lever, and when the piston-rod n^2 has been forced downwardly the curved path of the hook end of the lever L will cause it to disengage the lower end of the loop n^3 . As the liquid enters the bottles through the fillers such foam and gases as may be formed, together with the escaping air from within the bottle, pass upwardly through the mouth of the bottle around outside of the filling-tube f' and through the opening in the sealing-plate into the socket d^6 in the base-plate, from which it escapes through the passage o and hose O back into the cask M to replace the liquid which has been drawn from the cask and to keep a pressure upon the liquid in the cask constant. The bottles having been filled and the fillers having been withdrawn by the return movement of the operating-lever L, the base-plate D', together with the parts supported thereon, are shifted rearwardly by throwing the operating-lever H up into the position shown in Fig. 6 to bring the cork-containing socket d^4 into alinement with the mouth of the bottle. This movement having taken place, the treadle g^5 is further depressed to drive the cork and cork-fastener thereon from within the socket d^4 down into the mouth of the bottle from the position shown in Fig. 12 into the position shown in Fig. 14. After reaching the position shown in Fig. 14 the pressure upon the treadle g^5 is momentarily released, permitting the plate G' to shift so as to relieve the sleeves of the corking-plungers and permit them to slide upwardly through the openings in the plate G'. The treadle g^5 is then depressed, again bringing the central rod g of the corking-plunger into contact with the top of the fasteners, as shown in Figs. 5 and 13, thereby forcing the crown of the U-shaped portion of the fastener downwardly onto the cork and spreading the edges of the fastener outwardly into the grooves p in the mouths of the bottles C, as clearly shown in said Figs. 5 and 13. This completes the operation of corking and fastening the cork, and the treadle g^5 is permitted to lift under the ten-

sion of its actuating-spring g^{10} , lifting the corking-plunger above the base-plate D' . As the corking-plungers lift, the bevel-bearing g^8 forces the plate G' laterally into position to lock the sleeves g' ready for the next operation. The series of corked bottles is then lowered by the rearward movement of the hand-lever B' , which withdraws the several pistons b' , permitting the bottle-sustaining plungers b to drop. The same rearward throw of the lever B' , after lowering the bank of bottles, operates the endless belt or chain c , through the spring-actuated pawl c' , ratchet-wheel C^2 , spring-arm c^2 , and the sprocket-wheel C' , to carry the bank of corked bottles rearwardly from beneath the sealing-plate and at the same time present a succeeding bank of bottles in position beneath the sealing-plate and free the lifting-plungers b ready for a repetition of the operation of filling, corking, and fastening, as hereinabove described.

By the above-described mechanism the liquid may be transferred from the cask or other reservoir to the bottles, and the froth and gas, together with the air in the bottles, may be transferred from the bottles to the cask or reservoir without permitting the liquid to come in contact with outside air, the filling, corking, and fastening of the corks being accomplished without rehandling the bottles.

By applying pressure to the inflowing column of liquid foam may be expelled from the bottle until it is completely filled with the liquid, the displacement which the filler makes within the bottle being sufficient to lower the liquid therein to receive the cork when the filler is withdrawn.

It is obvious that the machine may be utilized without the pump, where the liquid in the reservoir or cask is under sufficient head or pressure to cause it to enter the bottles, and that the return-escape for froth, air, and gas may be led into the open air or to any other receptacle instead of the reservoir or cask from which the liquid is being drawn off for any purpose it is found expedient.

The apparatus is not limited in its use to a single kind of liquid, but may be used for bottling any liquids whether under head of pressure or not—such, for example, as the carbonated mineral waters, the various beverages commonly known as "soft" drinks, the various wines and liquors, beer, and ale.

What I claim is—

1. The combination with means for feeding banks of bottles step by step into position to be filled, of a filling mechanism, a corking mechanism and a cork-fastening mechanism and means for bringing the said filling, cork-

ing and cork-fastening mechanisms into and out of alinement with the bank of bottles while held in position, substantially as set forth.

2. The combination with the bottle-filling mechanism and a corking mechanism arranged to coöperate with the filling mechanism, of a reservoir for cork-fasteners and means for conveying the fasteners from their reservoir into position to be operated upon by the corking mechanism, substantially as set forth.

3. The combination with means for feeding bottles step by step into position to be filled and a sealing-plate for receiving the mouths of the bottles, of plungers for forcing the bottles toward the sealing-plate, a hydraulic press for operating the plungers and means for filling and corking the bottles while held in contact with the sealing-plate, substantially as set forth.

4. The combination with the corking-plunger and means for operating it, of a reservoir for cork-fasteners and a turn-table mounted in position to convey the fasteners successively from the fastener-reservoir to a position beneath the plunger, substantially as set forth.

5. The combination with the filling-reservoir mounted to reciprocate, the fillers connected therewith and means for holding the bottles in position to be filled, of a supply-reservoir, a connection between the supply-reservoir and filling-reservoir, a pump interposed in said connection and an operating-lever common to said pump and to the reciprocating filling-reservoir, substantially as set forth.

6. The combination with a corking-plunger comprising a central driving-rod and a sleeve loosely surrounding said rod, of means for reciprocating the plunger and means for automatically locking the sleeve to the plunger throughout a portion of its movement and leaving it free to slide on the plunger throughout a portion of its movement, substantially as set forth.

7. The combination with the filling mechanism and the supply-reservoir, of means for forcing the liquid to the filler comprising a cylinder, a reciprocating piston within the cylinder and an operating-lever arranged to engage the piston during a portion of its stroke only in each of two opposite directions, substantially as set forth.

WILLIAM MILES FOWLER.

Witnesses:

FREDK. HAYNES,
GEORGE BARRY, Jr.