

No. 624,335.

Patented May 2, 1899.

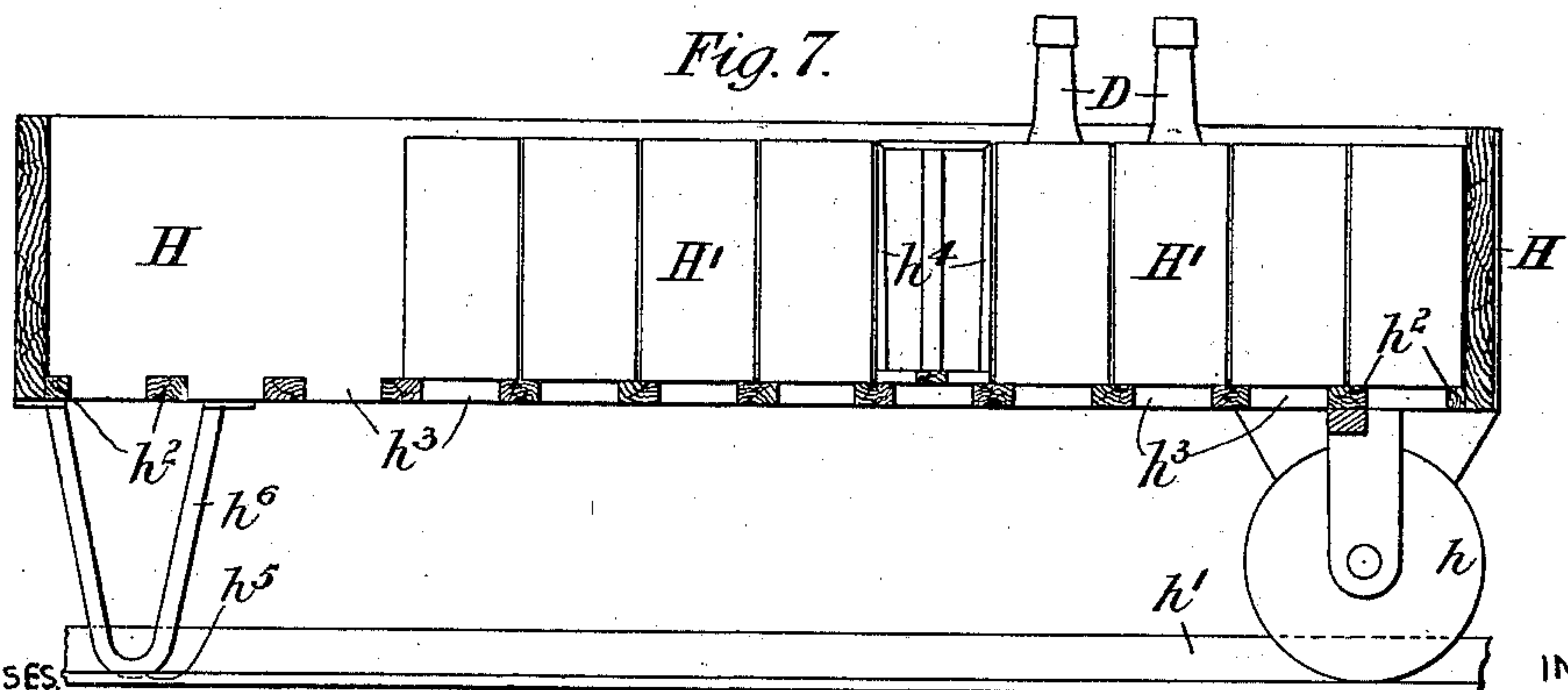
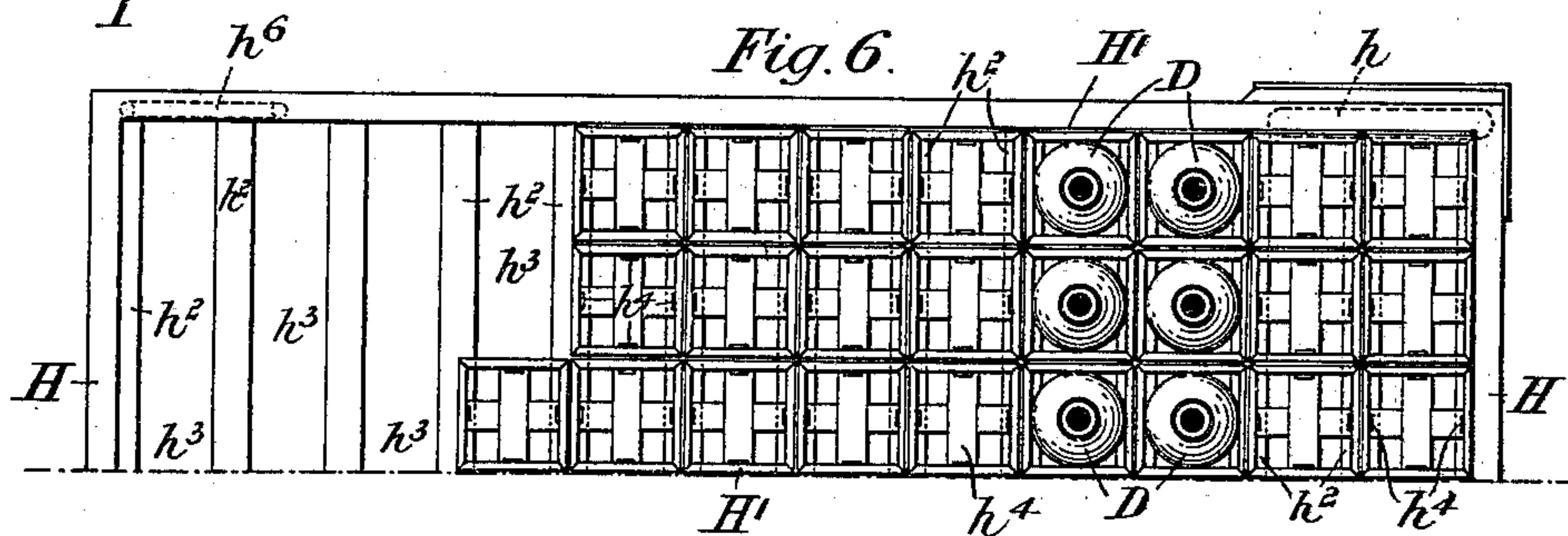
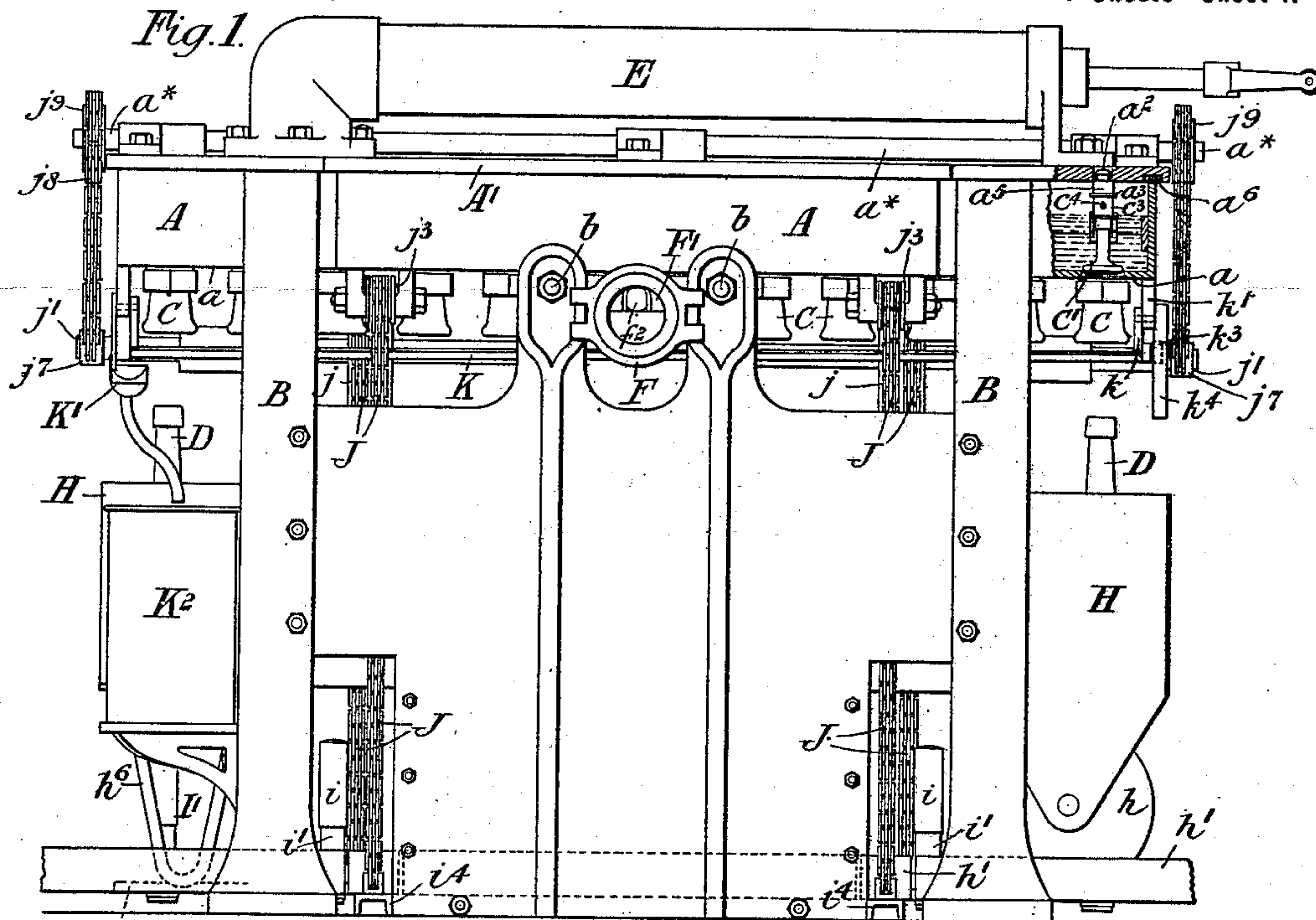
W. HUCKS, JR.

APPARATUS FOR CHARGING BOTTLES WITH LIQUIDS.

(Application filed Aug. 16, 1898.)

(No Model.)

4 Sheets—Sheet 1.



WITNESSES.

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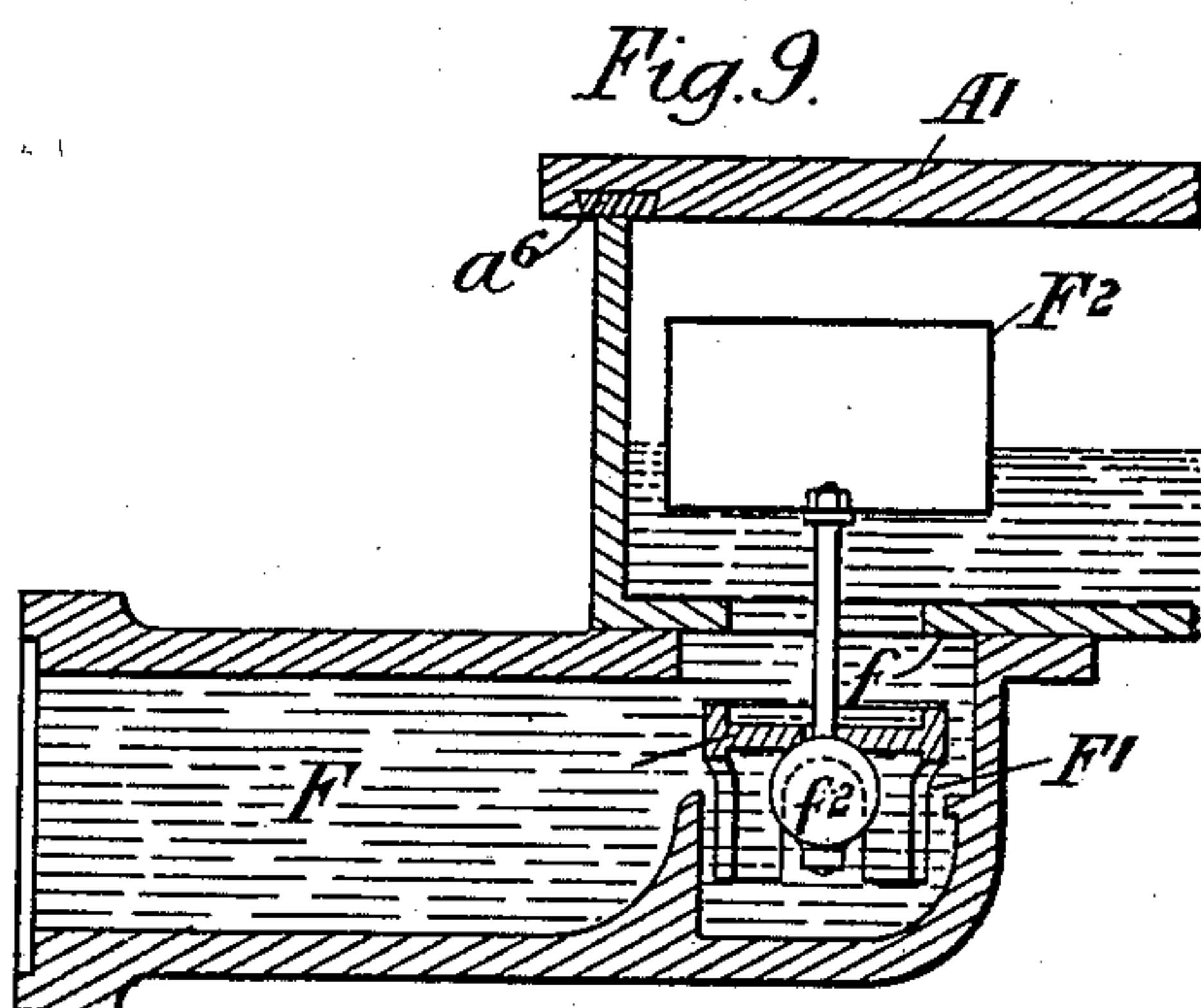
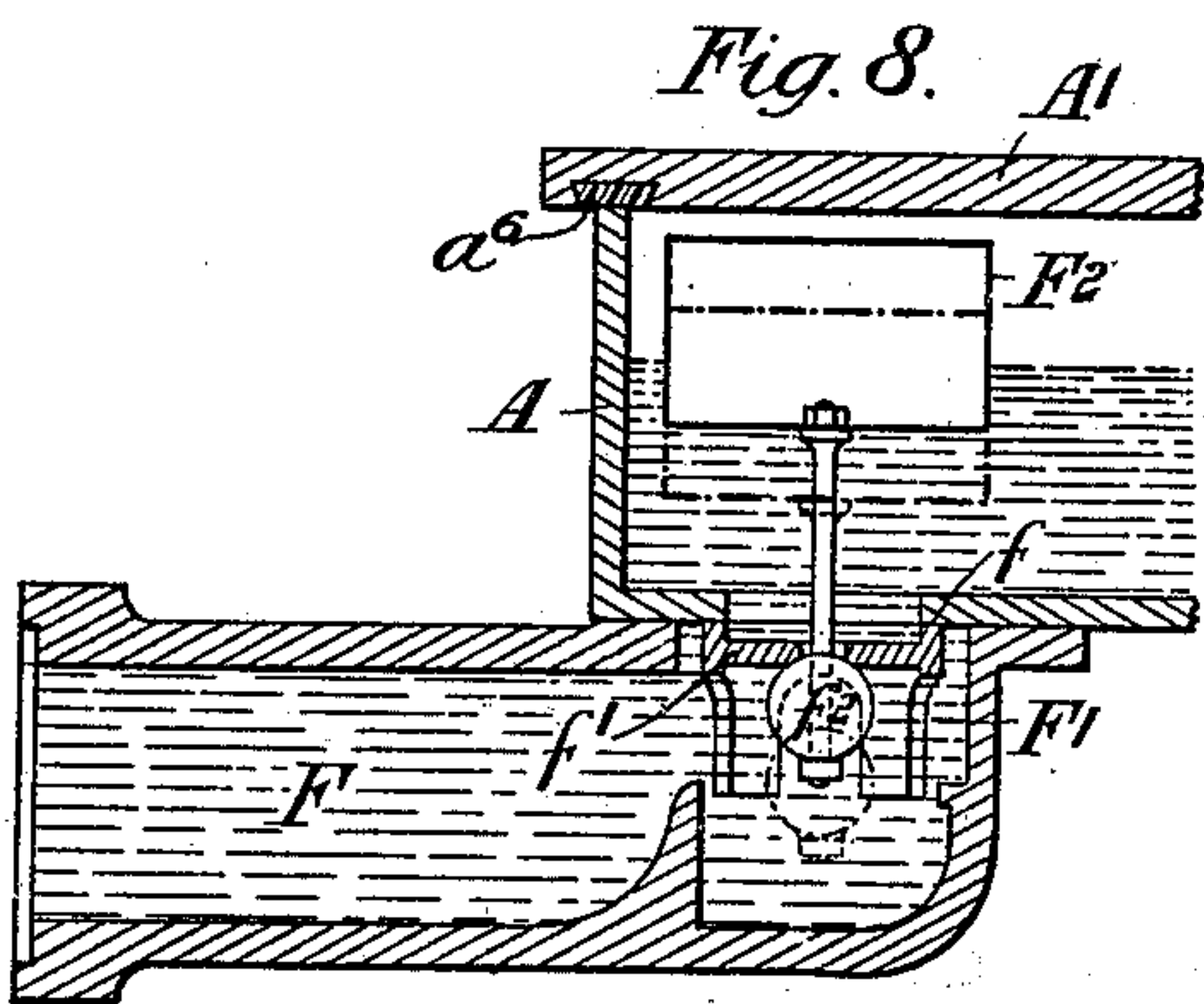
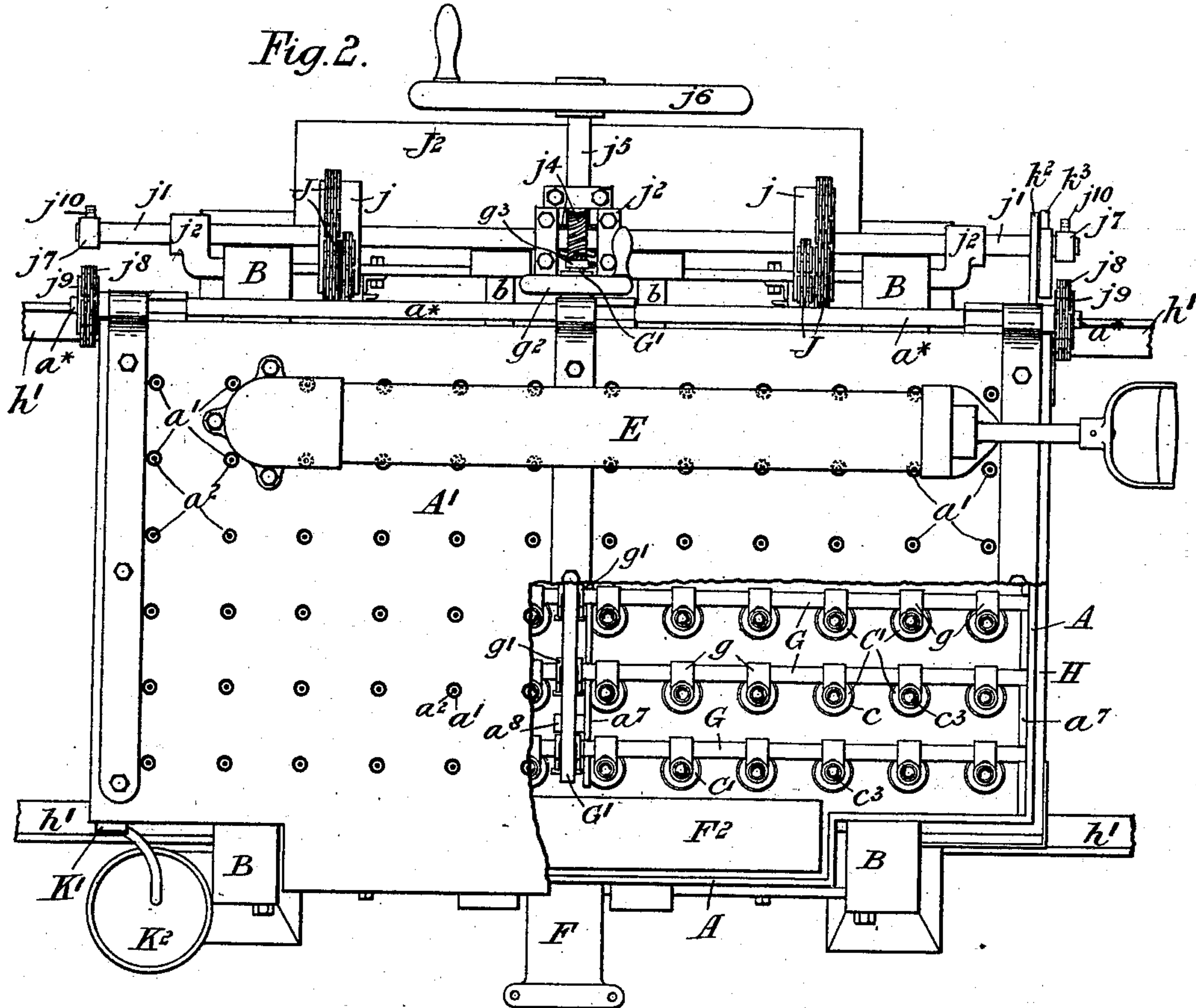
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4 Sheets—Sheet 2.



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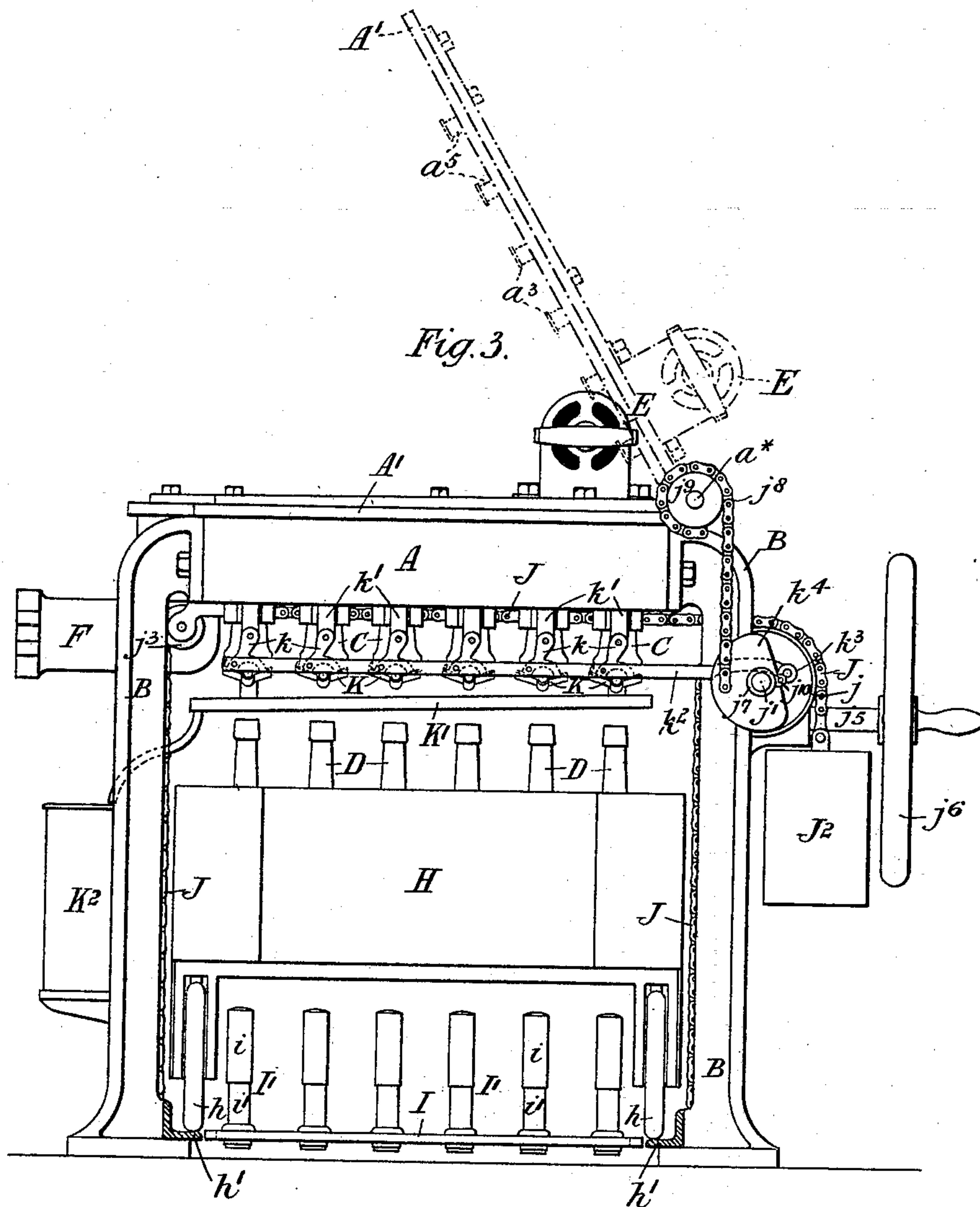
W. HUCKS, JR.

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4 Sheets—Sheet 3.



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No. 624,335.

Patented May 2, 1899.

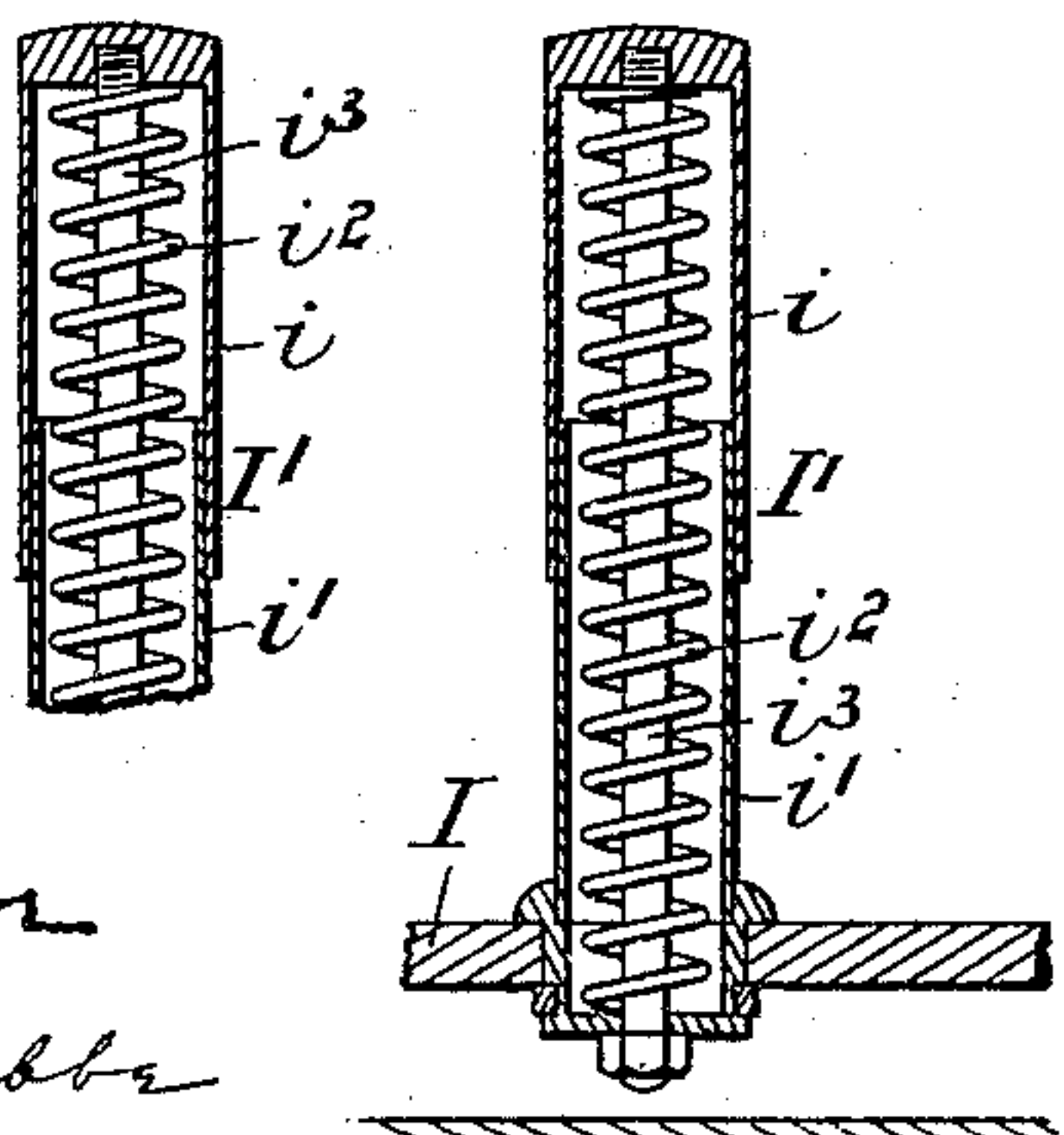
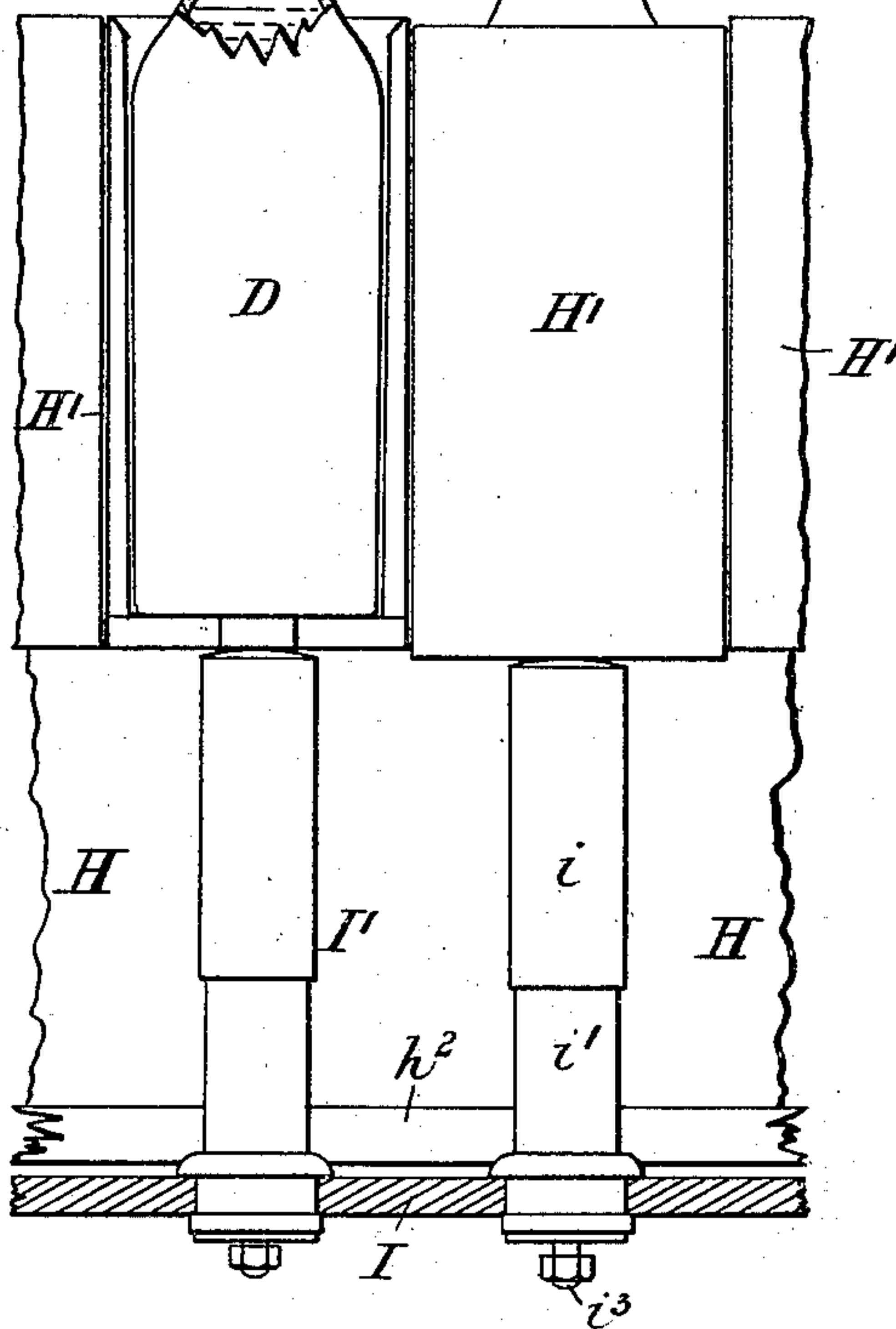
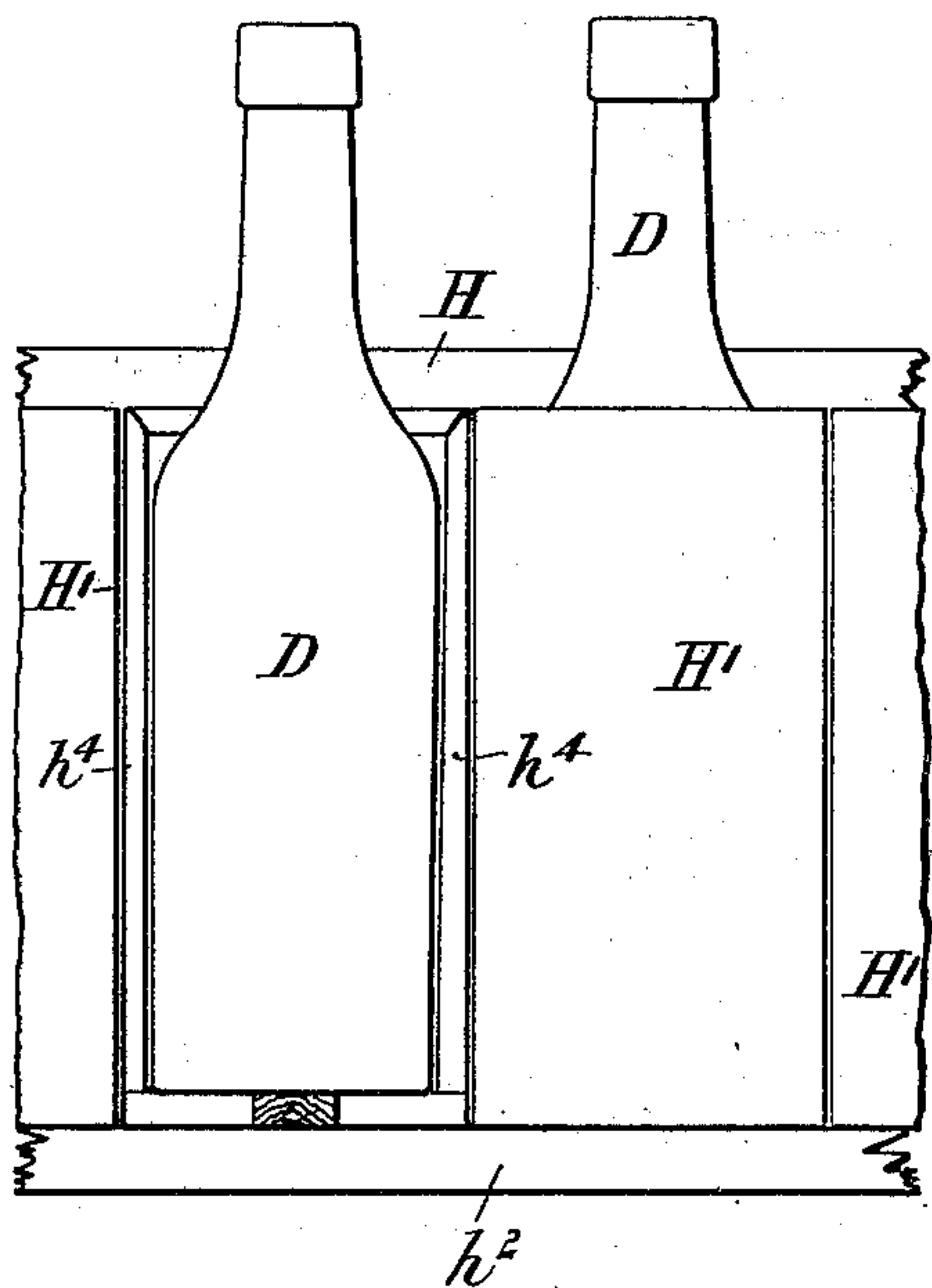
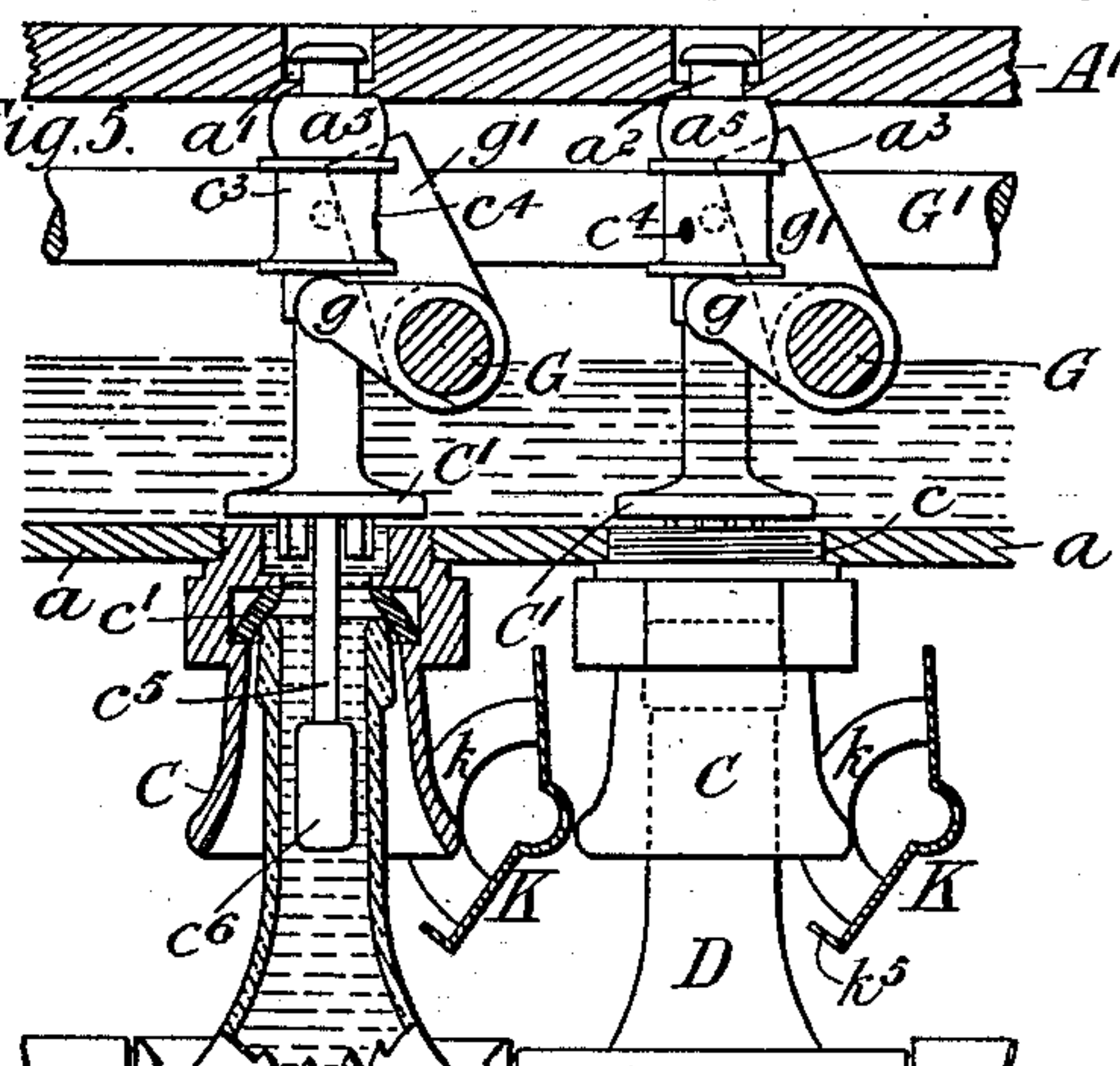
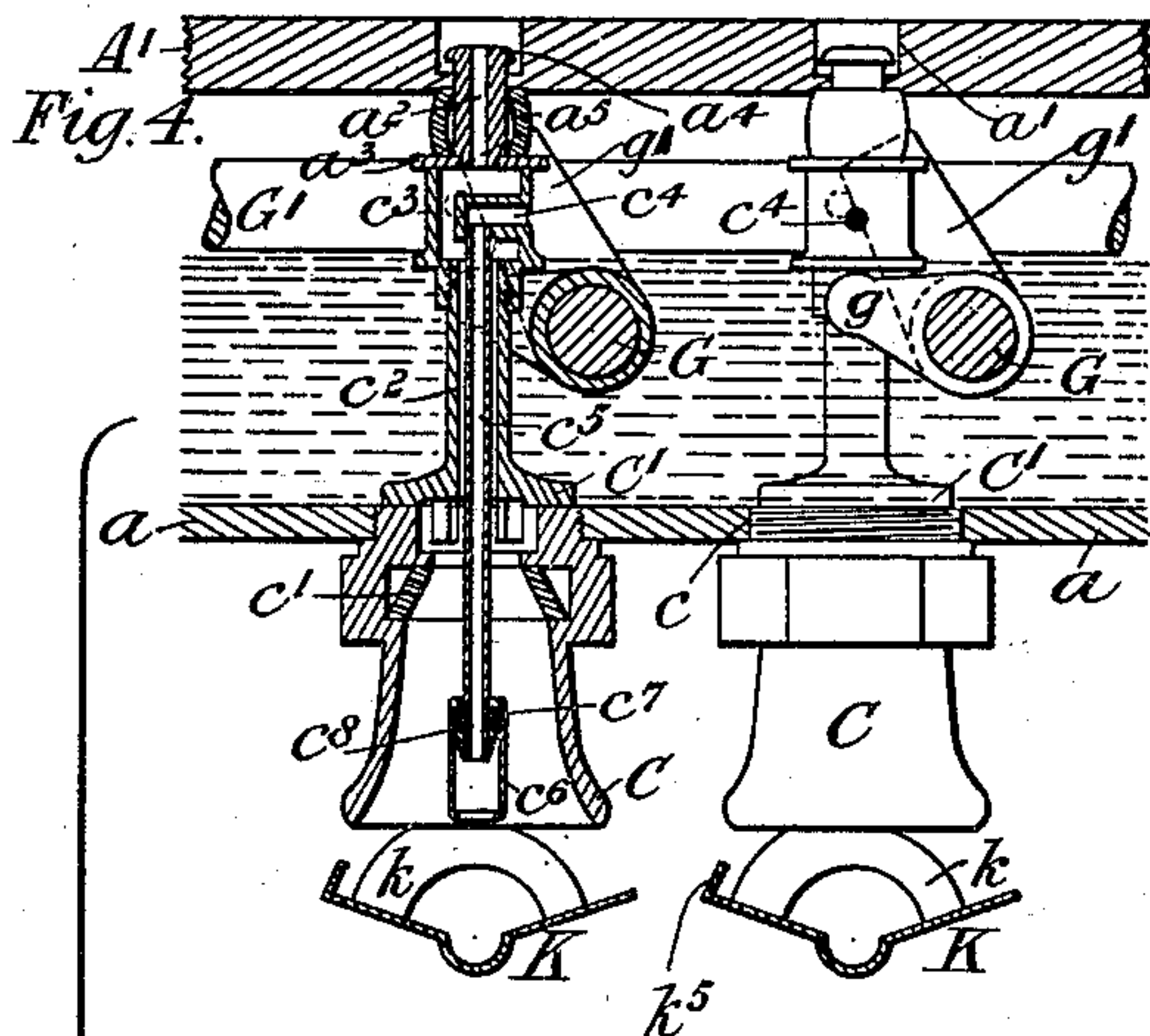
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WITNESSES.

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WILLIAM HUCKS, JR., OF LONDON, ENGLAND.

APPARATUS FOR CHARGING BOTTLES WITH LIQUIDS.

SPECIFICATION forming part of Letters Patent No. 624,335, dated May 2, 1899.

Application filed August 16, 1898. Serial No. 688,696. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM HUCKS, Jr., engineer, a subject of the Queen of Great Britain and Ireland, and a resident of 22 Oval road, Camden Town, London, England, have invented certain new and useful Improvements in Apparatus for Charging Bottles or other Vessels with Liquids, (for which a British patent has been applied for, No. 1,533, dated January 19, 1898,) of which the following is a specification.

This invention has for its object to provide apparatus whereby liquids can be quickly charged into a considerable number of bottles, jars, or other vessels simultaneously, the charging being effected to the same distance below the mouths of all the vessels.

I will describe my invention by reference to the accompanying drawings, in which—

Figure 1 is a front elevation, and Fig. 2 a plan, both partly broken away, of one of the improved apparatus. Fig. 3 is an elevation of the right-hand end of Fig. 1. Figs. 4 and 5 are enlarged sectional views showing certain parts of the apparatus in different positions. Fig. 6 is a half-plan, and Fig. 7 a longitudinal vertical section, of the bottle-containing truck; and Figs. 8 and 9 are enlarged sectional views of one of the valves.

Like letters of reference indicate like parts throughout the several figures of the drawings.

According to my invention I provide a tank or reservoir A, supported on suitable standards B and bearing-bars *b* and having in its bottom *a* outlet-openings *c* in number corresponding to the number of vessels D to be charged at each operation. Into these openings are fitted conical mouths C for receiving and guiding the mouths of the vessels D, the said conical mouths being provided with resilient seatings *c'* for making tight joints with the bottle-mouths, as shown clearly in Fig. 5. The upper ends of the conical mouths C constitute seatings for valves C', the vertical stems of which are formed with central passages *c*² and at their upper ends terminate in cup-shaped chambers *c*³, provided with lateral outlet-passages *c*⁴, with which are connected the upper ends of suction-tubes *c*⁵, which, as shown clearly in Fig. 4, pass centrally through the before-mentioned passages

*c*². On the lower end of each of the suction-tubes *c*⁵ I provide a sleeve *c*⁶, which, while capable of sliding longitudinally on the said tube, is prevented from leaving it by means of a washer *c*⁷ and conical nut *c*⁸, as shown in Fig. 4.

The tank or reservoir A is provided with a lid or cover A', hinged thereto by a rod or shaft *a**, rigidly connected to the said lid. The lid A' is provided with a number of countersunk holes *a'*, so situated that when the lid is closed, as shown in full lines in the drawings, each of the said holes will be immediately over one of the before-described valves C'. In each of the holes *a'* is fitted a tube *a*², having flanges *a*³ *a*⁴, of which the former is adapted to bear upon and make a tight joint with the upper edge of one of the before-described cup-shaped chambers *c*³, and the latter serves to prevent the tube *a*² from leaving the hole *a'*. On each tube *a*² is provided an india-rubber or equivalent sleeve *a*⁵, adapted at its respectively opposite ends to bear against the flange *a*³ and the under side of the lid A', so as to make tight joints at these parts and tend always to force the flange *a*³ away from the lid A' and thereby when the lid is in its closed position hold the said flange in tight contact with the particular chamber *c*³ beneath it.

The lid A' at its under side is provided with india-rubber *a*⁶ for making a tight joint between itself and the tank, and on its upper side it is provided with a suction-pump E of any desired construction for exhausting the air from within the tank A when the lid A' is closed, as hereinafter more particularly explained.

To the front part of the tank A is connected a pipe F, through which the liquid is supplied to the said tank from any convenient reservoir. In the pipe F, I provide a valve F', adapted to be operated by a float F², situated within the tank, so that the said valve will be opened when the level of the liquid in the tank falls and closed when the level of the liquid rises. As shown in Figs. 8 and 9, the valve F' preferably comprises a main valve *f*¹, adapted to bed on a seating *f*, and an auxiliary or relief valve *f*², adapted to bed on a seating formed on the main valve *f*¹, by which arrangement I am able to use a main valve

of large area for effecting rapid filling of the tank A and insure that the said valve shall not be prevented from opening by the pressure of liquid against its back or under side.

5 Should this pressure when the valve is closed, as shown in Fig. 8, be sufficient to prevent the descent of the main valve f' when the level of liquid in the tank A falls, the float F^2 in its downward movement moves the relief-valve

10 f^2 down from the main valve, as shown in dotted lines in Fig. 8, (this valve f^2 being so shaped that its surface is exposed to but little unbalanced pressure,) and consequently relieves the pressure upon the main valve f' ,

15 which immediately thereafter by its own weight falls into its open position, as shown in Fig. 9, and thereby allows the liquid to flow freely into the tank A, the relief-valve f^2 being at this time bedded on its seat. As the

20 level of the liquid ascends in the tank A the float is raised and the main valve f' is moved toward and ultimately bedded on its seat f , as shown in Fig. 8, the supply of liquid to the tank A being thereby stopped.

25 To enable all the valves C' to be simultaneously opened and closed, I provide a number of shafts G, supported at their ends and center parts in bearing-bars a^7 , secured in the tank A, the center of these bearing-bars be-

30 ing mounted on legs at a distance from the bottom of the tank, so as to allow the liquid to pass freely below it. On the shafts G are secured a number of forked arms g , each of which engages with a collar or projection on

35 one of the before-described tubular stems of the valves C' , so that as these shafts are turned on their axes in one direction, as indicated in Fig. 5, they raise the valves C' off their seats and allow the liquid to flow out of

40 the tank A, and as they are turned in the opposite direction they allow the valves to return to their closed or normal position. At about midway between their ends the shafts G are provided with forked arms g' , which en-

45 gage with pins or projections extending from a non-rotating rod G' , supported in fixed bearings a^8 , (only one of which is shown in the drawings,) so that it may be moved longitudinally therein, a suitable feather and key

50 way or other means being provided for preventing its rotation. The backward end of the rod G' is screw-threaded and extends through the back of the tank A, at which part it is provided with a nut g^2 , conveniently in

55 the form of a hand-wheel, as shown in the drawings. By rotating this nut or hand-wheel g^2 in one direction the rod G' is drawn outward from the tank, and through the shafts G the valves are all simultaneously raised from their seats, and by rotating it in the opposite

60 direction the said valves are allowed, under the influence of their own weight, to return to their seats. To prevent the nut or hand-wheel g^2 from being accidentally unscrewed from off the rod G' , I may secure a collar g^3 on the latter by means of a pin, this pin being readily removable, so that when necessary

the said collar and nut or hand-wheel may be detached from the rod G' . After the collar g^3 and nut or hand-wheel g^2 have been taken 70 off the rod G' , as last described, the said rod and shafts G and the valves C' may be removed from the tank, so as to allow the latter to be thoroughly well cleansed.

The vessels D to be charged with liquid are 75 placed in a receptacle or truck H, having conveniently two wheels h , adapted to travel along rails h' , laid beneath the tank A. The bottom of the truck H, as shown clearly in Figs. 6 and 7, is formed of transverse bearing-rails h^2 , having intermediate spaces h^3 be- 80 tween them. In the truck H, I provide a number of boxes or cases H' , each for containing one of the vessels D and all arranged so as to slide freely up and down in the truck H, 85 to facilitate which movement the vertical walls of the said cases may conveniently be formed of smooth sheet metal—such as tin, for example—these sheet-metal walls, if desired, being stiffened by a wooden or other 90 frame work h^4 , which will also serve to properly centralize the vessels D in the cases H' .

Between the rails h' I provide a movable platform I, into which are fitted plungers I' , in number corresponding to the number of 95 the vessels D to be filled. Each of the plungers I' , as shown clearly in Fig. 4, comprises two telescopically-arranged tubes $i i'$, a spring i^2 , which tends always to force the tubes $i i'$ apart, and a rod i^3 for preventing the separa- 100 tion of the said tubes, and each such plunger is immediately beneath one of the before-described valves C' .

The platform I is carried by two bearing-bars i^4 , attached to chains J, which are con- 105 nected to pulleys or drums j , secured on a shaft j' , mounted in bearings j^2 at the back of the apparatus, the said chains, where necessary, passing over suitable guide-pulleys j^3 . The shaft j' is connected by worm-gear j^4 , Fig. 110 2, with a shaft j^5 , on which is secured a hand-wheel j^6 , by means of which the said shaft j^5 and the shaft j' may be rotated, and the platform I consequently raised or allowed to descend. To facilitate the raising of the plat- 115 form I, I attach to two of the chains J a weight J^2 to counterbalance the weight of the said platform and its attachments.

To facilitate the raising and lowering of the tank-lid A' , which is of some considerable 120 weight, I may provide on the shaft j' pulleys or drums j^7 , adapted to engage with chains j^8 , attached to other pulleys j^9 , secured on the pivot-rod a^* , which, as before described, is rigidly connected to the lid A' . Normally 125 the chains j^8 are disconnected from the pulleys j^7 and hang loosely, as shown in Fig. 3, and when it is desired to raise the lid A' all that is necessary is to connect the free ends of the chains to perforated lugs j^{10} , provided 130 on the pulleys j^7 , by means of pins passed through the said chains and lugs, and then turn the hand-wheel j^6 in the necessary direction, the subsequent lowering of the lid

being effected by turning the hand-wheel j^6 in the opposite direction. The worm-gearing j^4 will serve to retain the lid in its raised position for any desired length of time.

5 For catching and collecting any liquid which may drip from the conical mouths C after the withdrawal of the vessels D therefrom I provide inclined gutters K, which are pivoted by brackets k to lugs k' , extending
10 downward from the under side of the tank A, these gutters at their lower ends being arranged to discharge all such liquid into a fixed inclined gutter K', which in turn discharges it into a receiver K². When this
15 receiver becomes filled, it may be removed and an empty one substituted for it. The brackets k at one end of the apparatus are all pivotally connected to a rod k^2 , on which is pivoted an antifriction-roller k^3 , acted upon
20 by a cam k^4 , secured on the before-described shaft j' . The last-described mechanism is so arranged in conjunction with the before-described platform-raising devices that when the platform I is in its lowest position the
25 swinging gutters K will, as shown in Figs. 1, 3, and 4, be directly beneath and catch any liquid falling from the conical mouths C, and when the platform I is raised to bring the mouths of the vessels D into the mouths C the
30 gutters K will, as shown in Fig. 5, be swung aside from beneath the conical mouths C and out of the way of the then ascending vessels D, any liquid which at that time remains upon the swinging gutters K being directed by
35 the gutter lips or flanges K⁵ into the aforesaid fixed gutter K'.

To maintain the practical continuity of the rails h' , portions of them are secured to the before-mentioned bearing-bars i^4 , so as to
40 bridge across the spaces between the other fixed portions provided at the ends and central part of the apparatus, and to insure the truck H being placed in the position necessary for bringing the vessels D into coincidence with the conical mouths C, I may form
45 recesses h^5 in the said rails for receiving the ends of the truck-legs h^6 , as shown in dotted lines in Figs. 1 and 7.

Assuming the tank A to be charged with
50 liquid up to, say, the level indicated in Figs. 1 and 4, the lid A' and valves C' and F' to be closed, and the platform I to be in its lowest position, which is the normal condition, the operation may be described as follows: A
55 truck H, filled with the vessels D, is moved beneath the tank A and the truck-legs h^6 engaged with the rail-recesses h^5 . The operator then turns the hand-wheel j^6 , so as to raise the platform I, and thereby cause the plungers
60 I' to pass through the spaces h^3 in the bottom of the truck and push the bottle-cases H' and vessels D upward until the mouths of the latter are all firmly bedded against the resilient seatings c' , any inequality in the height
65 of the vessels D being compensated for by the yielding of the plunger-springs i^2 , as indicated in Fig. 5, wherein as an example of

such inequality the two cases H' and the corresponding plunger-tubes i therein shown are represented as raised to different heights. 70
The operator then turns the nut or hand-wheel g^2 , so as to open the valves C' and allow the liquid to flow from the tank A into and completely fill the vessels D, as shown in Fig. 75
5, the air during this charging operation passing from the vessels D into the tank A by way of the tubes c^5 and outlets c^4 , the sleeves c^6 at this time serving to prevent any of the descending liquid from being carried into the tubes c^5 by the outrush of air. The operator 80
next turns the nut or hand-wheel g^2 , so as to allow the valves C' to close, and then operates the pump E, so as to form more or less of a vacuum within the tank A, and thereby cause all the liquid between the lower ends of 85
the sleeves c^6 and the valves C' to be sucked out of the conical mouths C and vessels D by way of the tubes c^5 and discharged into the tank A through the outlets c^4 , the withdrawal of liquid from the vessels D ceasing as soon 90
as the liquid falls to the level of the lower end of the sleeves c^6 , owing to the external air being then admitted into the vessels D through the tubes a^2 and passages c^2 . The platform I is then lowered by rotating the 95
wheel j^6 in the necessary direction, so as to allow the then charged vessels to descend into the truck H, which latter is next moved from beneath the tank to make room for the next truck-load of unfilled vessels. During the 100
filling of the vessels D, as above described, the level of the liquid in the tank A descends and the float effects the opening of the valve F', so as to admit a further supply of liquid into the tank. 105

If the mouths of the vessels D come into contact with the sleeves c^6 during the ascent of the said vessels, these sleeves will slide upward on the tubes c^5 and afterward descend into their proper position when the mouths 110
of the vessels are properly centered by the conical mouths C.

The before-described apparatus may be modified without departing from the essential features of the invention. For instance, 115
instead of withdrawing the surplus liquid from the vessels D by suction, as previously described, I may use any other suitable construction of air-displacer for effecting this purpose. For example, I may force it out by 120
air-pressure. Further than this, I may dispense with the valves C' in the tank A by providing the latter with a well or sunk portion for accommodating a displacer, which when depressed causes the liquid to flow over 125
the tank-outlets, and thereby fill the vessels D, and which when raised allows the liquid to flow away from the said outlets to admit of the surplus liquid being withdrawn or removed from the vessels and allow the said 130
vessels to be moved away from the tank-outlets.

What I claim is—

1. In apparatus for charging vessels with

liquid the combination with a tank having a lid and means for hermetically closing together the lid and tank and a number of outlet-openings and means for hermetically sealing these openings to the vessels to be charged, of valves for the said openings all in operative connection with each other, valve-operating devices for opening all of the said valves simultaneously, suction and air-inlet tubes in the outlet-openings, an air-displacer in operative connection with the outlet-openings, an inlet-valve for the tank and a float in operative connection with the inlet-valve, drip-catchers for the outlet-openings, cam mechanism for operating the said drip-catchers, a receptacle for containing the vessels to be charged, mechanism for bringing the mouths of the said vessels and the outlet-openings together and raising the tank-lid substantially as set forth.

2. In apparatus for charging vessels with liquid the combination with a tank having a number of outlet-openings, of valves for the said openings, valve-controlling devices for simultaneously opening all the said valves and allowing all the vessels to be filled to repletion and an air-displacer in operative connection with the outlet-openings for withdrawing liquid from the vessels substantially as set forth.

3. In apparatus for charging vessels with liquid the combination with a tank having a number of outlet-openings for receiving the mouths of the vessels of downwardly-depending tubes passing through the said openings and an air-displacer in operative connection with the tubes substantially as set forth.

4. In apparatus for charging vessels with liquid, the combination with a tank having a number of outlet-openings and means for hermetically sealing these openings to the vessels, a valve for each of the said outlet-openings, downwardly-depending tubes adapted to enter the vessels and an air-displacer in operative connection with the tubes adapted to empty the vessel to a predetermined depth, as and for the purpose set forth.

5. In apparatus for charging vessels with liquid the combination with a tank having a lid or cover and a number of outlet-openings and means for effecting the hermetical sealing together of the lid and tank and the openings and vessels of valves for the said openings, downwardly-depending tubes for the valves adapted to enter the vessels, air inlet and outlet passages through the valve-tubes in the tank-lid connecting with the air-inlet passages and an air-displacer in operative connection with the air-outlet passages substantially as set forth.

6. In apparatus for charging vessels with liquid the combination with a tank having a number of outlet-openings for receiving the mouths of the vessels of a gutter or drip-catcher for the outlet-openings and cam mechanism for moving it from beneath the said openings substantially as set forth.

7. In apparatus for charging vessels with liquid the combination with a tank having a lid or cover and a number of outlet-openings for receiving the mouths of the vessels, and a vertically-movable platform having plungers coinciding with the outlet-openings and mechanism for raising and lowering the platform, of means in operative connection with the said platform-actuating devices for operating the tank-lid substantially as set forth.

8. In apparatus for charging vessels with liquid the combination with a tank having a movable lid and a number of outlet-openings and a vertically-movable platform for bringing the mouths of the vessels and the outlet-openings together of two shafts connected by worm-gearing, pulleys or drums on one of the shafts and flexible connections between the pulleys or drums and the platform substantially as set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

WILL. HUCKS, JUN.

Witnesses:

HENRY JAMES MILLAR,
WILLIAM FREDERICK UPTON.