

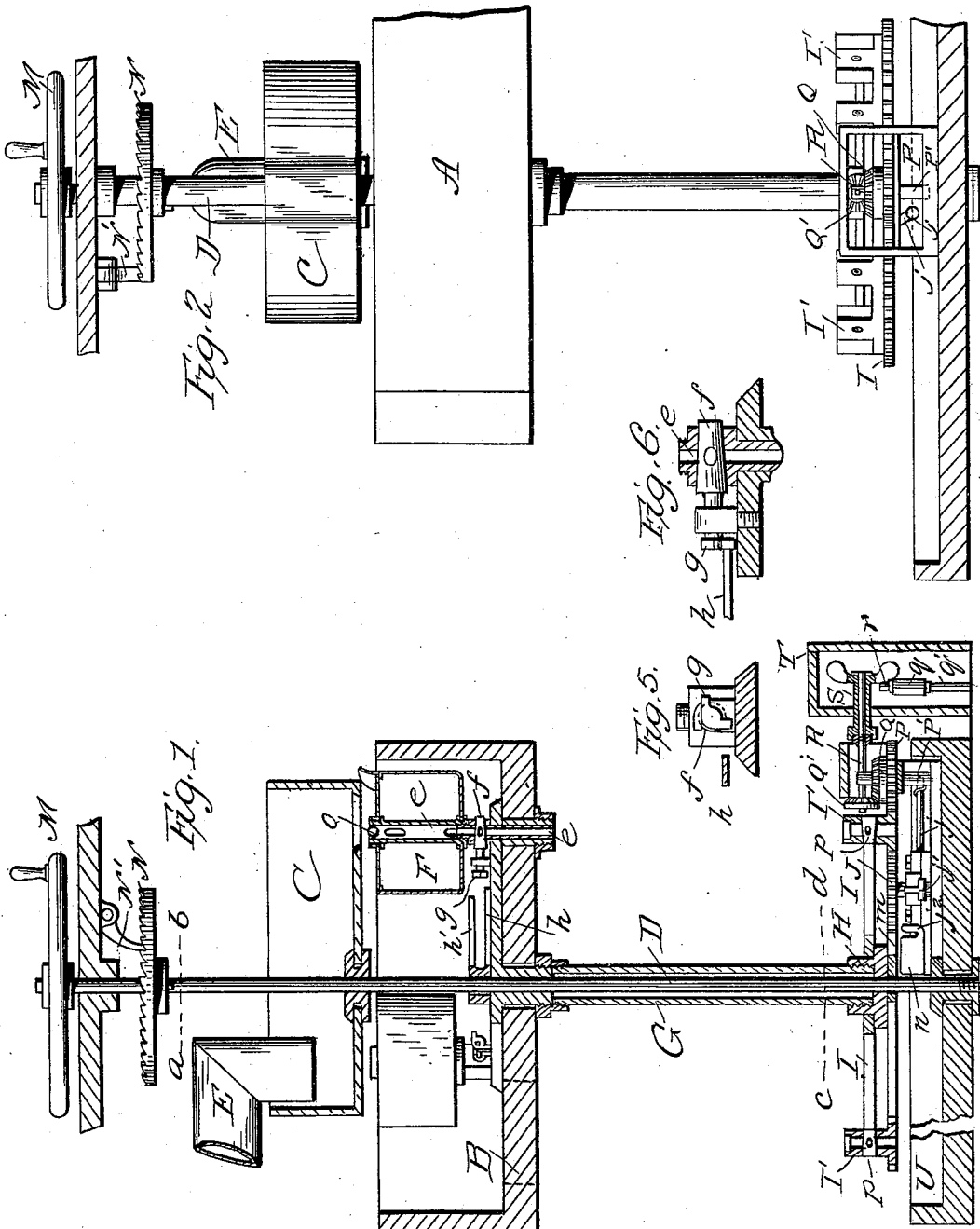
(No Model.)

5 Sheets—Sheet 1.

W. W. MUTTER & W. DAWSON.
DISTILLER'S SAFE.

No. 507,832.

Patented Oct. 31, 1893.



Attest
Palmer Macalister
F. L. Middleton

Inventors
William Watson Mutter
William Dawson
by Richards & Co.
ATTYS.

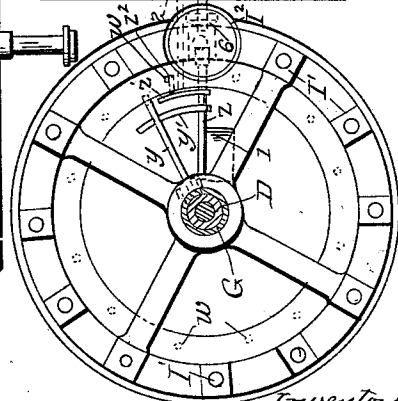
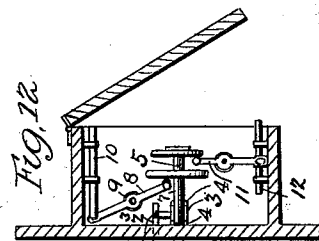
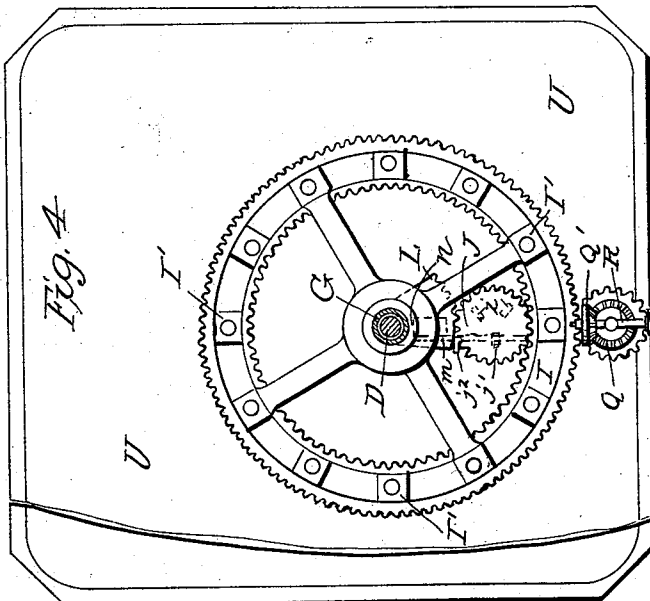
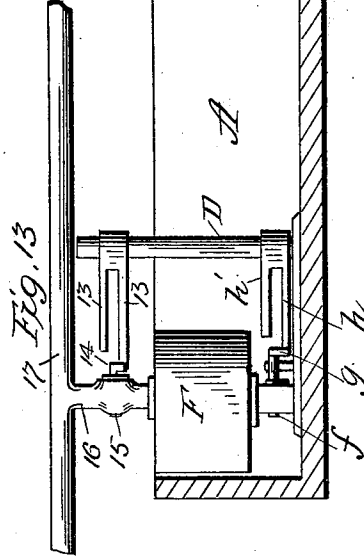
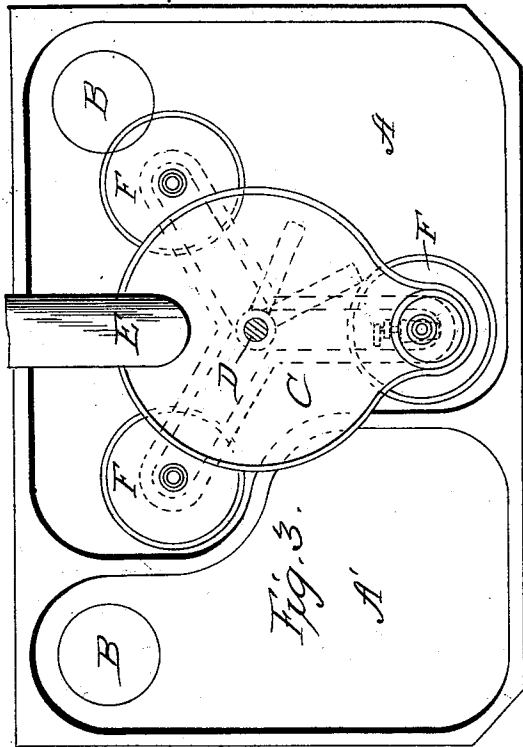
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Attest
J. L. Middleton

Inventors
William Watson Mutter
William Dawson
by Richards & Co.
ATTY.

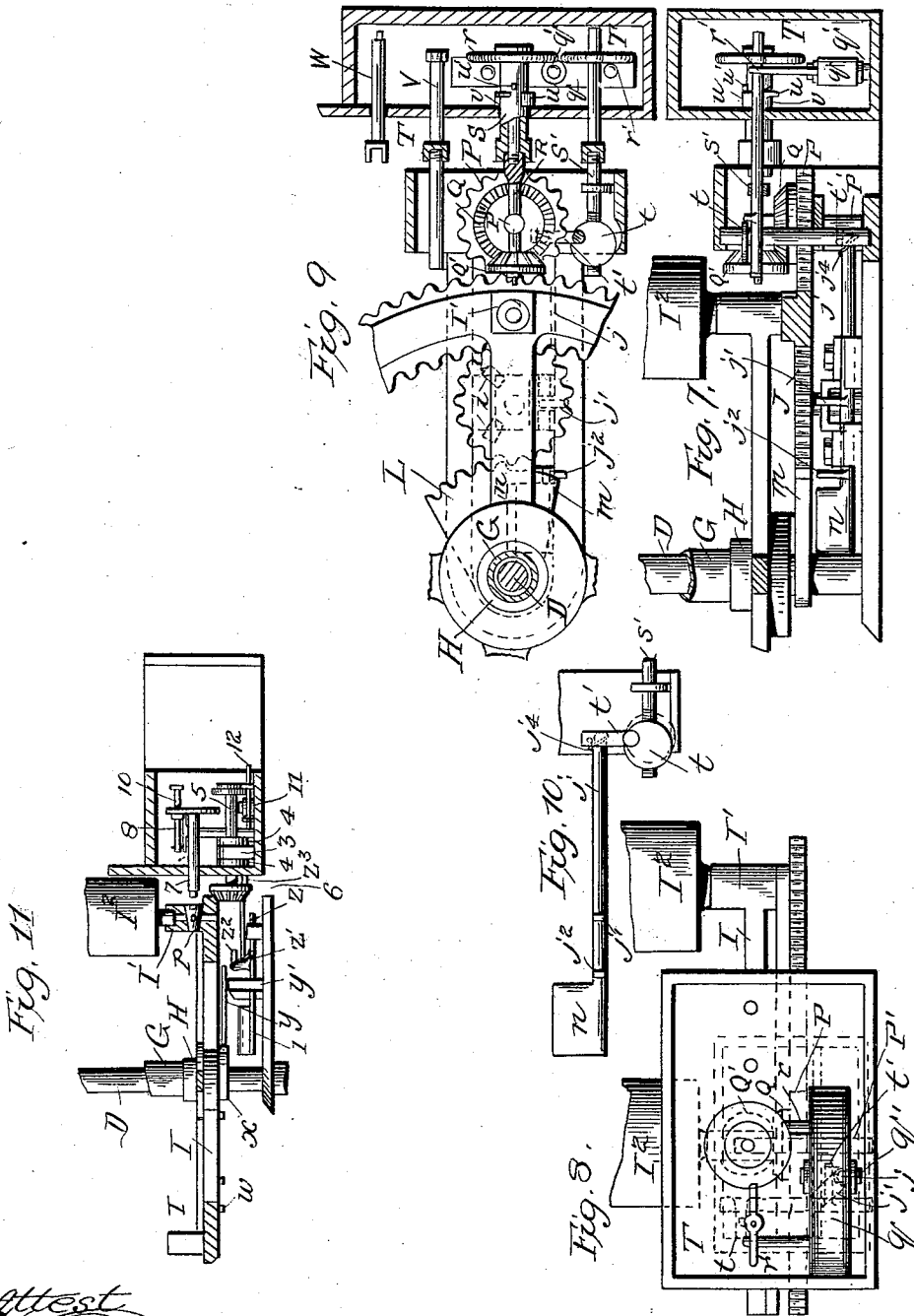
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5 Sheets—Sheet 3.

W. W. MUTTER & W. DAWSON.
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No. 507,832.

Patented Oct. 31, 1893.



Attest
Patron D. M. M. M.
F. L. Middleton

Inventors
William Watson Mutter
William Dawson
by *Richards & Co*
ATTN

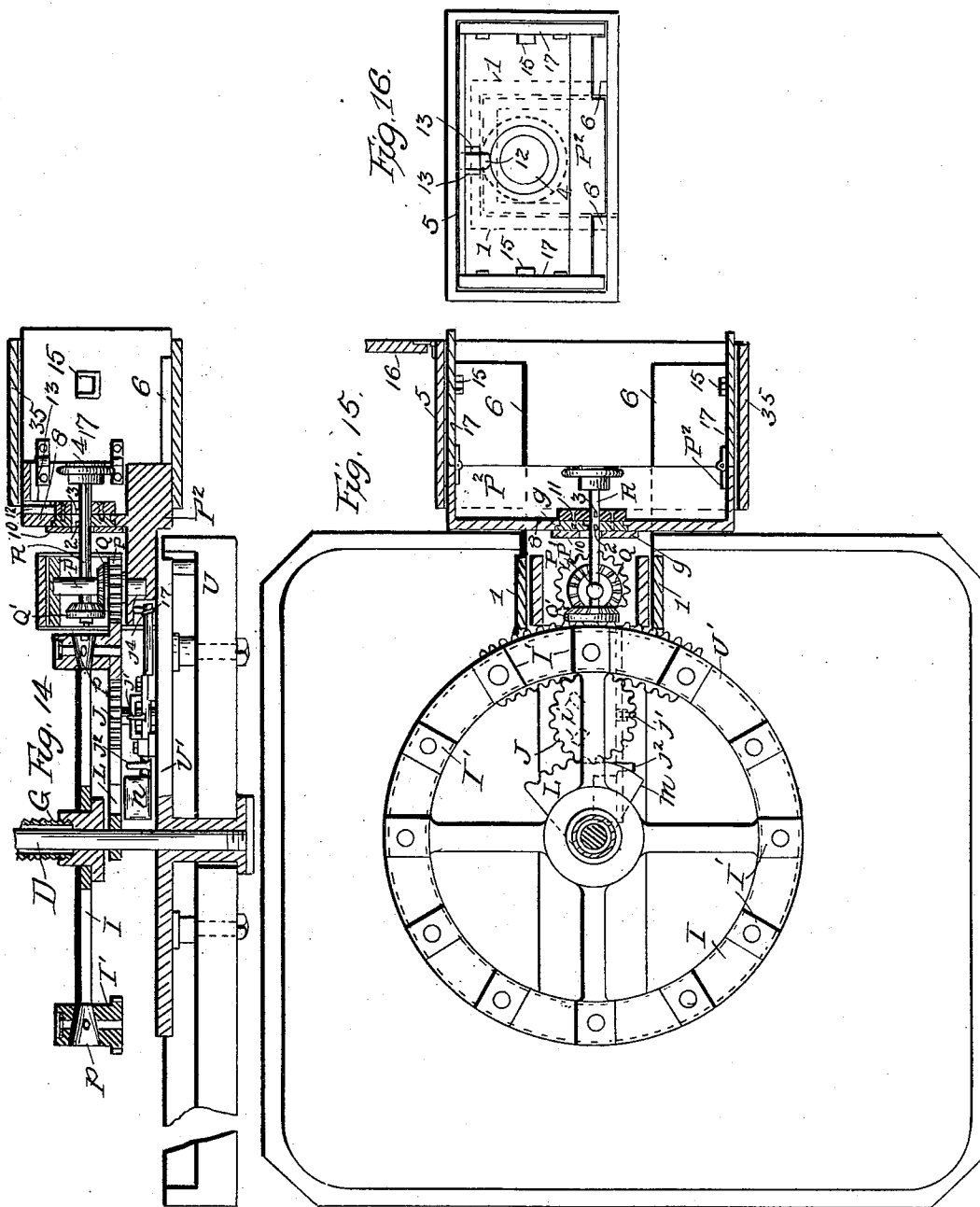
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5 Sheets—Sheet 4.

W. W. MUTTER & W. DAWSON
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No. 507,832.

Patented Oct. 31, 1893.



Attest
Richardson & Co.
F. L. Middleton

Inventors
William Watson Mutter
William Dawson
by *Richardson & Co.*
ATTYS

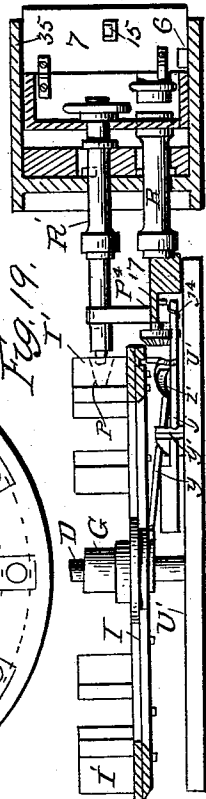
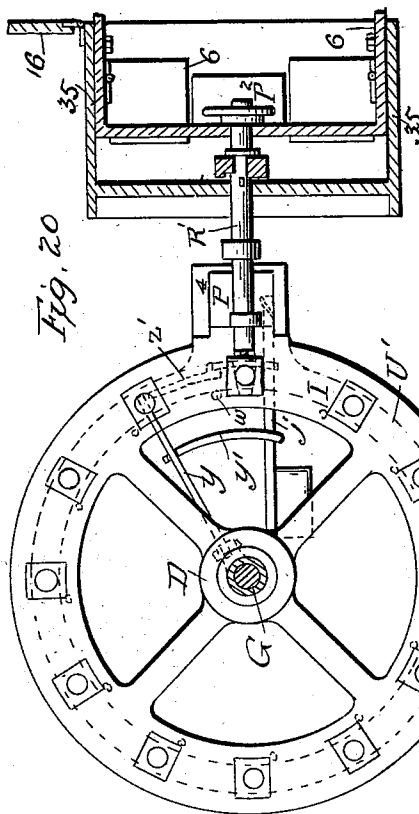
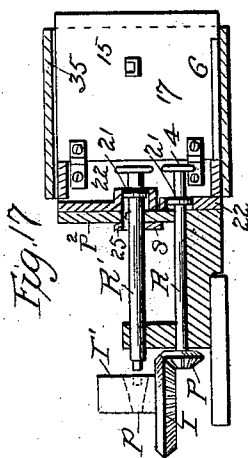
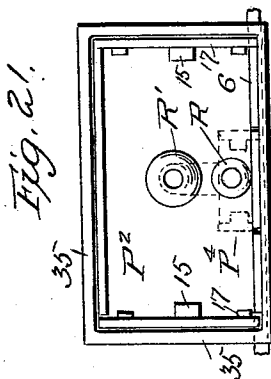
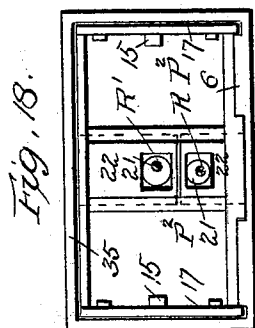
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5 Sheets—Sheet 5.

W. W. MUTTER & W. DAWSON.
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No. 507,832.

Patented Oct. 31, 1893.



Attest
F. L. Middleton

Inventors
William Watson Mutter
William Dawson
by Richards & Co
ATTY

UNITED STATES PATENT OFFICE.

WILLIAM WATSON MUTTER AND WILLIAM DAWSON, OF GLASGOW,
SCOTLAND.

DISTILLER'S SAFE.

SPECIFICATION forming part of Letters Patent No. 507,832, dated October 31, 1893.

Application filed October 4, 1890. Serial No. 367,140. (No model.) Patented in England July 2, 1889, No. 10,667.

To all whom it may concern:

Be it known that we, WILLIAM WATSON MUTTER, distiller, of 41 Ann Street, and WILLIAM DAWSON, brewer, of Anderston Brewery, Bishop Street, Glasgow, in the county of Lanark, Scotland, have invented new and useful Improvements in or Relating to Distillers' Safes, said improvements being also applicable for check-sampling the spent wash at outlets of patent stills, (which have been patented in Great Britain and Ireland by Letters Patent dated July 2, 1889, No. 10,667;) and we do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art or manufacture to which it relates to make and use the same.

The invention has for its object the provision of such additions to distillers' safes as at present used as shall insure that a sample will be taken automatically at any stage of the distillation and preserved beyond the control of the man working the still for examination at any subsequent time.

In the accompanying drawings, Figure 1 is a vertical section of one modification of the improved apparatus. Fig. 2 is an elevation. Fig. 3 is a sectional plan at the line *a-b*, Fig. 1. Fig. 4 is a sectional plan at the line *c-d* Fig. 1, and Figs. 5, 6, 7, 8, 9, and 10 are views drawn to a larger scale of details of this first modification. Fig. 11 is an elevation and Fig. 12 a plan of a modified arrangement for turning the table or platform I. Fig. 13, is a detail of mechanism for actuating stop-cocks of cup F. Fig. 14 is a vertical section of another arrangement of the check sampling apparatus. Fig. 15 is a part plan and part horizontal section, and Fig. 16 is an end elevation of the same. Figs. 17 to 21 inclusive are views illustrative of modifications of the arrangement in Figs. 15, 16 and 17.

As shown by the modification illustrated at Figs. 1, 2, 3, 4, 5, 6, 7, 8, 9, and 10 the apparatus consists of a trough divided into two compartments, A, A', or it may be divided into as many more compartments as may be desired—according to the description of still with which the trough is to be used. In the case of a wash still one compartment is sufficient. Each

of the compartments A, A', has an opening B, constituting an outlet by which the condensed product at any stage of the distillation passes into the proper receiver, the product being conducted into the several compartments by a spout C, mounted on a rotating spindle D, and placed underneath the worm end E. In the compartment A, a series of measuring cups F, are carried the spout C, delivering a sample into each of these cups in the course of its rotation. The cups F, which are preferably closed at their upper ends have each a tube *e*, at the center the said tube being slotted in its length to communicate with the interior of the cup and being provided with a stop cock *f*, the spindle or key of which has on its outer end a quadrant or lever *g*, having two arms at right angles to each other as seen at Fig. 5. On the spindle D, two arms or levers *h*, *h'*, are keyed in position to act on the arms of the lever *g*, the lever *h*, in the rotation of the spindle striking against one arm to open the stop cock and the following lever *h'*, striking against the other arm to close it. Underneath the trough A, A', the spindle D, has a sleeve G, surrounding it and on a nut H, screwed on to the lower end of the said sleeve there is carried loosely a table or platform I, having around its circumference a number of sockets I', in which a series of vertical sample tubes I², are supported the bottoms of the sockets having preferably leather or equivalent packing washers situated in them to prevent leakage. The table or platform I, is toothed around both its outer and inner peripheries as more particularly seen at Fig. 4, and with the inside teeth there is geared a wheel J, which also gears with a quadrant L, keyed on the spindle D. In the wheel J, three slots *i*, are made at equal distances from each other and in conjunction with them there is provided a spindle *j*, having a crank *j'*, which enters each of these slots successively. On the spindle *j*, there is another crank *j''*, which as the spindle D, rotates, is acted upon by a plain part *m*, on the quadrant L, so as to turn the spindle *j*, and release the crank *j'*, from the wheel J, the toothed part of the quadrant immediately thereafter turning the wheel so as to rotate the table or platform I, a distance

equal to the distance between two sockets I', which being effected the quadrant L, passes out of gear with the wheel whose motion is stopped by a weight *n*, on the end of the spindle *j*, turning the said spindle in the opposite direction and entering the crank *j'*, into a slot *i*, the under side of the quadrant being so constructed as to liberate the crank *j'*, at the required time. At each partial rotation of the table I, another sample tube I², is brought under the end of the tube *e*, through the cup and filled by the opening of the stop cock *f*, as before described. The spindle D, is actuated by a hand wheel M, secured on its upper end and it is prevented from rotating excepting in one direction by the ratchet wheel N, keyed on it, and with which a pawl N', is geared. The tube *e*, of each cup has or may have a ball valve *o*, as shown to close the entrance when the cup has been filled and around a portion of the tops of the cups, upwardly projecting guards may be fitted to prevent the liquid overflowing in any other than the desired direction.

With the teeth around the outer circumference of the table I, there is geared a spur pinion P, carried loosely on a vertical spindle P'. On the spur pinion P there is also fixed a bevel wheel Q, the said wheel being geared with a wheel Q', keyed on the end of a horizontal spindle R, which is formed in two parts screwed together, the part carrying the bevel wheel Q' passing loosely through the spindle P' a rectangular box end being formed on the section carrying the wheel which engages with a similarly shaped recess made in a sleeve S, inclosing the other section of the spindle the said section together with the sleeve having their outer extremities inclosed in a separate casing T, which is locked so as to keep this apparatus out of control of the person running the still. In conjunction with the spindle and sleeve there are provided in channels made under the seats of the test tubes a series of stop cocks *p*, and there is also provided a lever *q*, which is centered at *q'*, in the separate locked case T, the said lever having two pins *r*, *r'*, projecting vertically from it. The pin *r*, acts and is acted upon by a flange made at the outer end of the sleeve S, and the pin *r'*, acts and is acted upon by a spindle *s'*, which is also formed in two parts screwed together, the inner end of the spindle having jaws upon it between which there is situated a disk *t*, to which a lever *t'*, is connected eccentrically. The outer end of the lever *t'*, rests upon the end of the spindle *j*, which at that part has a raised spiral or screw thread made upon it as more particularly seen at *j'*, Fig. 10. On the sleeve S, there are also formed square or other angular projections *u'* in connection with which there is furnished a boss *u*, formed on or attached to the side of the case T, an opening being made in the boss for the passage of the projection *u'*, close up to the side of the case.

This apparatus excepting such of it as is

situated in the case T, is inclosed within the ordinary locked distiller's safe, (not shown on the drawings,) and it is under control of the manager and when he desires to test a sample he first opens the door of the case T and if the test tube under the exit from the cup F, is empty, he first draws the spindle *s'*, outward which through the disk *t*, and lever *t'*, acting on the feather *j'*, turns the spindle *j*, and releases the crank *j'*, from the slot on the under side of the wheel J. The manager by then turning the sleeve S, spindle R, and gearing Q', Q, P, partially rotates the table I, until the first filled tube is brought to that position. He then tests its contents and pushes the sleeve S and spindle R, inward so as to gear a rectangular key on the end of the spindle R, with the stop cock *p*, and by then turning the spindle the contents of the tube are discharged into the trough U, from whence they are pumped up into one or other of the compartments A, and thence discharged into the receiver. In so turning the spindle R, the projections *u'*, enter slots *v*, in the boss *u*, and lock the spindle and sleeve in position so that the spindle cannot be withdrawn until the stop cock is closed by turning the spindle in the reverse direction. In the event of the manager neglecting to withdraw the spindle R, from the stop cock or in the event of his neglecting to return the spindle *s'*, to its normal position and so to throw the crank *j'*, into gear with the wheel J, prior to attempting to shut the door of the case T, the said door comes in contact with the end of the spindle *s'*, pushing it inward and causing it to act on the pin *r'*, whereby the pin *r*, is made to act on the flange of the sleeve S, and so withdraw the key on the spindle R from the stop cock. A spindle V, also made in two sections screwed together passes from the interior of the case T, where it is or may be furnished with a cross head or handle to a pump situated within the casing of the safe at any convenient point and by which the discharged samples are raised to the compartment A, A', as before set forth. A fourth spindle W, also passes from the interior of the case T, to the inside of the safe where it acts upon a stop cock placed in a water pipe led into the safe and so situated as to enable the manager to introduce water at will into the sample under examination.

Under a modification illustrated in elevation at Fig. 11, and in plan at Fig. 12, the table or platform I, instead of being toothed on its outer and inner circumferences and geared with the spindle D, and with the apparatus worked from the locked casing T, in the manner hereinbefore described, has on its under side a series of pins *w*, placed equidistant between the sockets I', of the test tubes I². On the spindle D there is keyed an eye *x*, which has a jaw formed on its outer end wherein one extremity of a lever or rod *y*, is centered the said lever or rod rotating with the spindle D. In conjunction with the lever *y*, a

bridge y' , is provided the said bridge at each end constituting an inclined plane and on a spindle z , one end of which is carried by the bridge and the other end by a bearing on the base plate there is furnished a lever z' , having a pin z^2 projecting horizontally from it the spindle z , also having a counter weight l , the function of which is to maintain it in normal position. At each revolution of the spindle D, which is or may be effected by the means hereinbefore described, the lever or rod y , rises over the bridge y' , and in its passage it depresses the lever z' , so as to cause the pin z^2 , projecting from it to free itself from the pin w , of the table I, with which it had been in contact while the end of the lever y , coming in contact with the said pin turns the table I, until the lever has passed over the bridge y' , thereby bringing another sample tube underneath the cup F. Immediately the lever y , has passed out of contact with the lever z' , the weight l , raises the said lever and brings its pin z^2 , into contact with the next pin w , in succession thereby stopping the table with the tube underneath the exit from the cup. The lever z' , has an arm z^3 , extending from it into the case T, where the end of it is beveled or inclined downward and in connection with the said arm there is provided a pin 2, which projects from a block 3, held between collars 4 on a spindle 5, the inner end of which has a bevel wheel 6 upon it gearing with similar teeth made around the table I, the said wheel being maintained out of gear until the manager wishes to test the samples at which time the spindle 5, is pushed inward to gear the wheel with the table and in so doing it at the same time causes the pin 2 to ride over the arm z^3 , and depress the lever z' , until its pin z^2 is free from the pin w , so rendering the table free to be rotated by the wheel 6. A key spindle 7, passes through the side of the case T, to the interior of the safe to enable the manager to open and close the stop cocks p , as before set forth, the said spindle having on its outer end a flange or collar bearing upon one end of a lever 8, which is centered at 9, and has a bolt 10, connected to its other end which bolt when the spindle 7 is pushed inward to gear with the stop cock moves outward beyond the line of the door when shut and prevents the closing of the case T, until the spindle is returned to its normal position. Similarly in conjunction with the spindle 5, a lever 11, and bolt 12, are provided which prevent the closing of the door until the wheel 6 is disengaged from the table I.

The spindles 5 and 7 are or may be made in sections screwed together as hereinbefore described the object of which attachment is to enable the mechanism contained in the case T to be disconnected from that at the interior of the safe when it may be necessary to withdraw the latter apparatus bodily.

When it is desired to take samples at stated intervals of time instead of rotating the spin-

dle D, by hand as hereinbefore set forth clock-work mechanism with escapements of any suitable construction may be adapted for that purpose in which case the spout C is dispensed with and the spindle D, has as seen at Fig. 14 two levers 13 of similar construction to the levers h , Fig. 1, secured upon it above the level of the cup F, these levers acting at the required intervals on the arms of a crank 14, secured on the spindle of a stop cock 15, in similar manner to that illustrated at Figs. 5 and 6, so as to open and close a branch 16 on a pipe or channel 17, extending from the worm end to the receivers the said branch leading to the cup F, which together with the other parts of the apparatus are constructed and operated as before specified. This arrangement is especially applicable to taking samples at the spent wash outlets of "patent stills."

Fig. 14 shows in vertical section, Fig. 15 in part plan and part horizontal section and Fig. 16 in end elevation a further modification of the manager's check sampling apparatus connected to the spindle D, and sleeve G, being the same as at Fig. 1, as is also the arrangement of the toothed platform or table I, and the mechanism by which it is alternately partially rotated and stopped from the spindle D. The spur pinion P, geared with the teeth around the outer circumference of the table I, instead of having its vertical spindle P', stepped into a plate laid on the bottom of the trough U, of the safe as before described has its spindle carried by a slide P², which when the wheel is in gear bears upon a platform U', supported on studs and whose upper surface is level with or slightly above the upper edge of the trough. At the part of it within the safe the slide is of box form having two vertical side cheeks and a top or bridge supporting the upper end of the spindle P', the said box part sliding in a similarly formed guide I, made on the platform U'. The wheel P, is loose on its spindle P', and it has formed on or connected to its upper surface a bevel wheel Q, geared with a pinion Q', keyed on the spindle R, passing through the spindle P'. The spindle R, is in one length and it has upon it a head or thumb piece 4, contained within the locking part of the apparatus. The outer end of the slide P², is also of box shape and it is contained within a rectangular casing 35, in the bottom of which guides 6, are formed or fixed between which the slide P², is confined the guide 6 being terminated short of the sides of the casing as more particularly seen in Fig. 16. To the extreme outer ends of the sides of the slide there are hinged doors 17, which when open occupy the spaces between the guides 6, and the sides of the casing 35, and when closed and locked up they extend across the end of the slide. In the part 8 of the slide there is inserted a disk 9, which is retained in position by a face plate 10, and also by checking or "rabbeting" the circumference of the disk and that of the hole in which it is placed.

The said disk 9, has screwed or otherwise secured to it another disk 11, in one part of the circumference of which a hollow is made as shown by Fig. 15, and in conjunction with this disk a tongue 12, working between two side cheeks 13, formed on the slide P^2 , is provided. On the spindle R, two heels or projections 2, 3, are also formed the one marked 3, when the apparatus is in the position shown by Fig. 15 engaging with a slot made in the disk 11, so that when the manager or other responsible official turns the spindle R, and through it the gearing Q' , Q, P, to partially rotate the table and so bring its sockets I' , in succession opposite the end of the spindle R, the disks are at the same time rotated and the one 11, acting on the tongue 12, raises it through a slot in the slide P^2 , and against the end of the casing 35, the apparatus being so arranged that the tongue sinks each time the key hole of the stop cock p , in each socket I' , comes opposite the key on the end of the spindle R. The rotation is continued until a socket I' , containing a filled sample tube comes into the said position and the manager after testing the contents of such tube pushes the spindle R, inward so as to gear it with the stop cock and by then turning the spindle to the right the contents of the tube are discharged into the trough U. In so pushing forward the spindle the projection 3, enters the slot in the disk 9, and the projection 2, enters a slot in the face plate 10, which slot constituting a quadrant locks the spindle in position and prevents it from being drawn rearward until the stop cock p , is closed by turning the spindle in the opposite direction. The turning of the spindle to open the stop cock causes the tongue 12, to be shot out against the end of the casing 35, by the action of the projection 3, in the slot of the disk 9, so that a double check on withdrawing the spindle is provided until the stop cock is closed. When closed the slide P^2 is withdrawn together with the entire gearing P, Q, Q' , into the interior of the casing 35, and until the end of the slide is flush with the outer ends of the guides 6, the doors 17, cannot be closed and locked. As seen at 15 each half door may have a socket formed on or secured to it for the insertion of a bar to more easily and steadily move the slide P^2 backward and forward. In addition to the doors 17, on the slide P^2 , a door or doors 16, may also be hinged to the outer end of the casing 35, in which case, as seen by the drawings, the said door or doors cannot be closed until the inner doors 17 are shut. In the act of pushing the slide P^2 forward so as to gear the wheel P, with the table I, a pin 17, fixed in the under surface of the slide acting on the screw feather J^4 releases the crank j' from the slot in the under side of the wheel J, this apparatus being otherwise as hereinbefore described.

Fig. 18, illustrates in vertical section and Fig. 19, in end elevation a modified arrange-

ment in which a spindle R' , is provided for turning the stop cock p , in addition to the spindle R, for turning the table I. On each of these spindles a cam or eccentric 21, is secured and situated within a square hole made in a vertical plate 22, the two plates working in guides in the box part of the slide P^2 , which is contained within a casing as last described. The spindle R, has a bevel wheel P, secured upon it which when the slide is pushed inward to test a sample is geared direct with the table I, and when the tube containing the sample has by turning the said spindle been brought opposite the end of the spindle R' , this spindle is pushed inward to gear with the key seat of the stop cock. The spindle R' , has a projection 25, upon it which passes through an opening in the end of the boxed part of the slide and when the spindle has been turned through a quadrant to open the stop cock the said projection comes in contact with a heel or projection on the part 8, of the slide and stops its movement. At the same time the cam 21, of the spindle R' , acting upon the plate 22, pushes the said plate outward against the end of the casing 35, the stud 25 insuring that the spindle R' , cannot be withdrawn until the stop cock is closed and the plate 22, insuring that the slide cannot be moved backward until the closing of the stop cock has been effected by turning the spindle R' , and so depressing the widest part of the cam.

Fig. 22 illustrates in vertical section, Fig. 23 in plan partly in section and Fig. 24 in end elevation a modification of the last described arrangement as applied to the construction of safe described with reference to Figs. 11 and 12. With this construction the casing 35 is also close ended and separate spindles R, R' , are employed to rotate the table I, and to open and close the stop cocks both spindles being made in two lengths detachable from each other. In the close end of the casing 35, or in a block attached to it through which the spindles pass slots are made the slot in conjunction with the spindle R, being at its inner end circumferential to enable the spindle to be rotated so as to turn the table I, while at the inner end of the slot in conjunction with the spindle R' , a quadrant is formed to enable the spindle R' , after being geared with the stop cock p to be turned through a quarter of a revolution to open the same, the quadrant as hereinbefore set forth preventing the spindle from being withdrawn until the stop cock is closed.

The doors as applied to the arrangements Figs. 14, 15, 16, 17 and 18, preferably do not close entirely across the end of the slide but are provided simply to prevent the door on the outer casing 35, from being closed until the slide is withdrawn into the interior of the case and the doors of the slide folded inward.

Having now described the invention, what we desire to secure by Letters Patent is—

1. In a distiller's safe the combination of a trough A, a series of measuring cups therein, a source of supply leading to said cups, valved discharge passages leading from said cups, sampling tubes for receiving the discharge and a rotating spindle for operating the valves, substantially as described.

2. In a distiller's safe, a trough A, a series of measuring cups therein, a source of supply leading to said cups, valved discharge passages leading from said cups, a rotating table I carrying sampling tubes adapted to receive the contents of the measuring cups, means for rotating the table I step by step and for operating the valves of the measuring cups, substantially as described.

3. In a distiller's safe, a trough A, a series of measuring cups therein having valved discharge passages, a supply pipe or trough, a rotating table, a series of sampling tubes carried thereby, a vertical rotating spindle D having arms for operating the valves of the measuring cups and mechanism interposed between said spindle and the table for rotating the same step by step, substantially as described.

4. In a distiller's safe, a trough A, a series of measuring cups therein having valved outlets, a supply pipe or trough, a rotating table, sampling tubes carried thereby, means for operating the table step by step and means for operating the valves of the measuring cups in a definite relation to the movement of the sampling tubes whereby the contents of a cup may be discharged when a tube is beneath the same, a valved outlet from each sampling tube, and means for controlling the discharge therefrom, substantially as described.

5. In combination with the trough A, the

cups F, the valved discharge passages therefrom, the intermittently movable table I, the sample tubes carried thereby adapted to receive the contents of the measuring cups and having valved discharge passages, and means for operating said valves contained within a locked case, substantially as described.

6. In combination with the trough A, the cups F, having valved discharge passages, the table I, sampling tubes carried thereby, means for rotating the table step by step, means for operating the valves of the cups, means for locking the table against rotation, valves controlling the contents of the sampling tubes, and means for rotating the table to remove the tubes from beneath the discharge passages of the cups, the said operating means for locking the table, for discharging the contents of the tubes and for giving the second movement to the table being contained within a locked case, substantially as described.

7. In combination with a trough, a series of cups therein having valved outlets, sampling tubes adapted to register therewith, a spindle D with means carried thereby for rotating the sampling tube support and means also carried thereby for opening and closing the valves of the cups, and a spout C carried by said spindle and adapted to discharge into any cup, substantially as described.

In witness whereof we have hereunto set our hands this 17th day of April, 1890.

WILLIAM WATSON MUTTER.
WILLIAM DAWSON.

Witnesses:

GEO. M. CRUIKSHANK,
WALLACE FAIRWEATHER,
Both of Fel. Inst., Patent Agents, 62 St. Vincent St., Glasgow.