

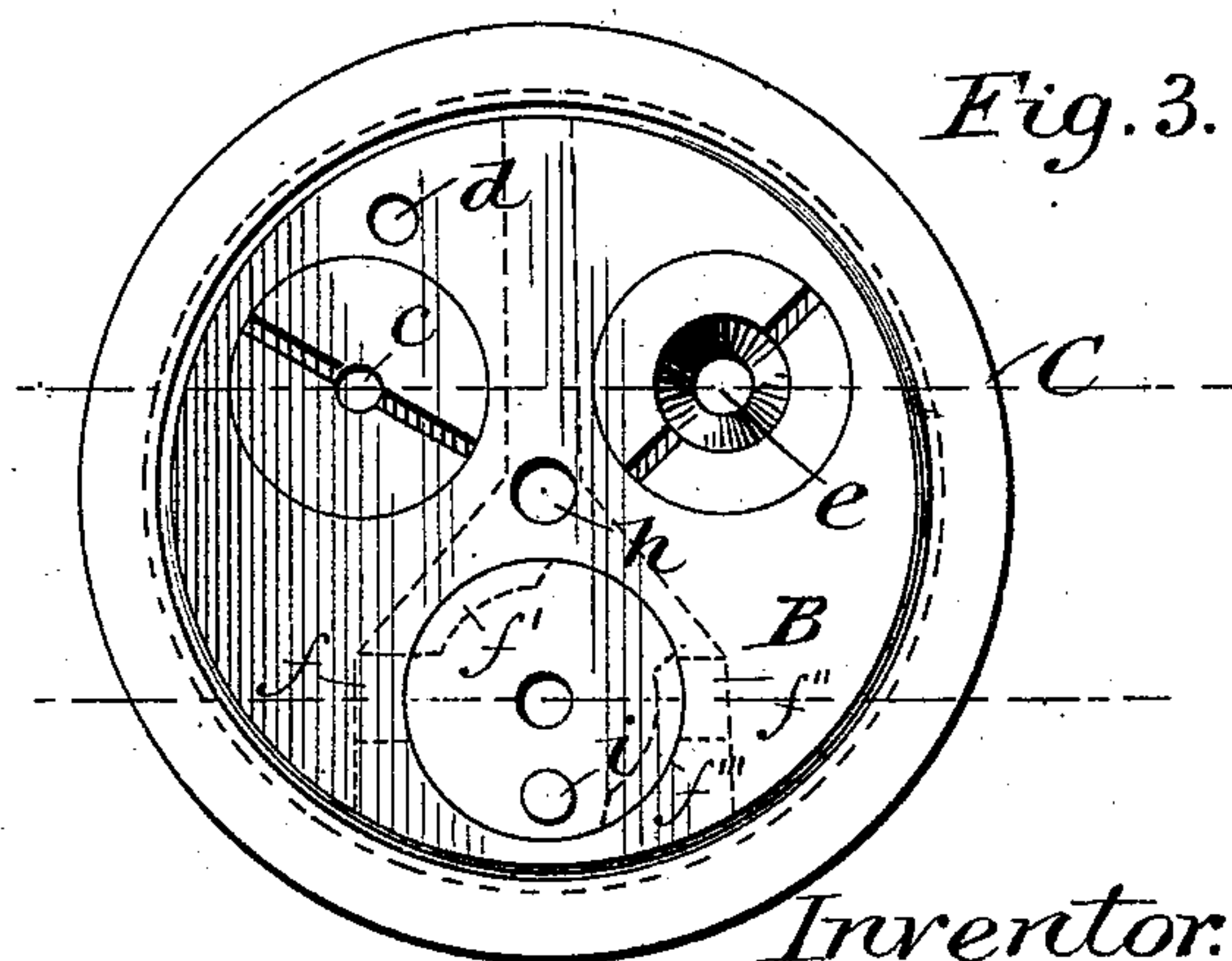
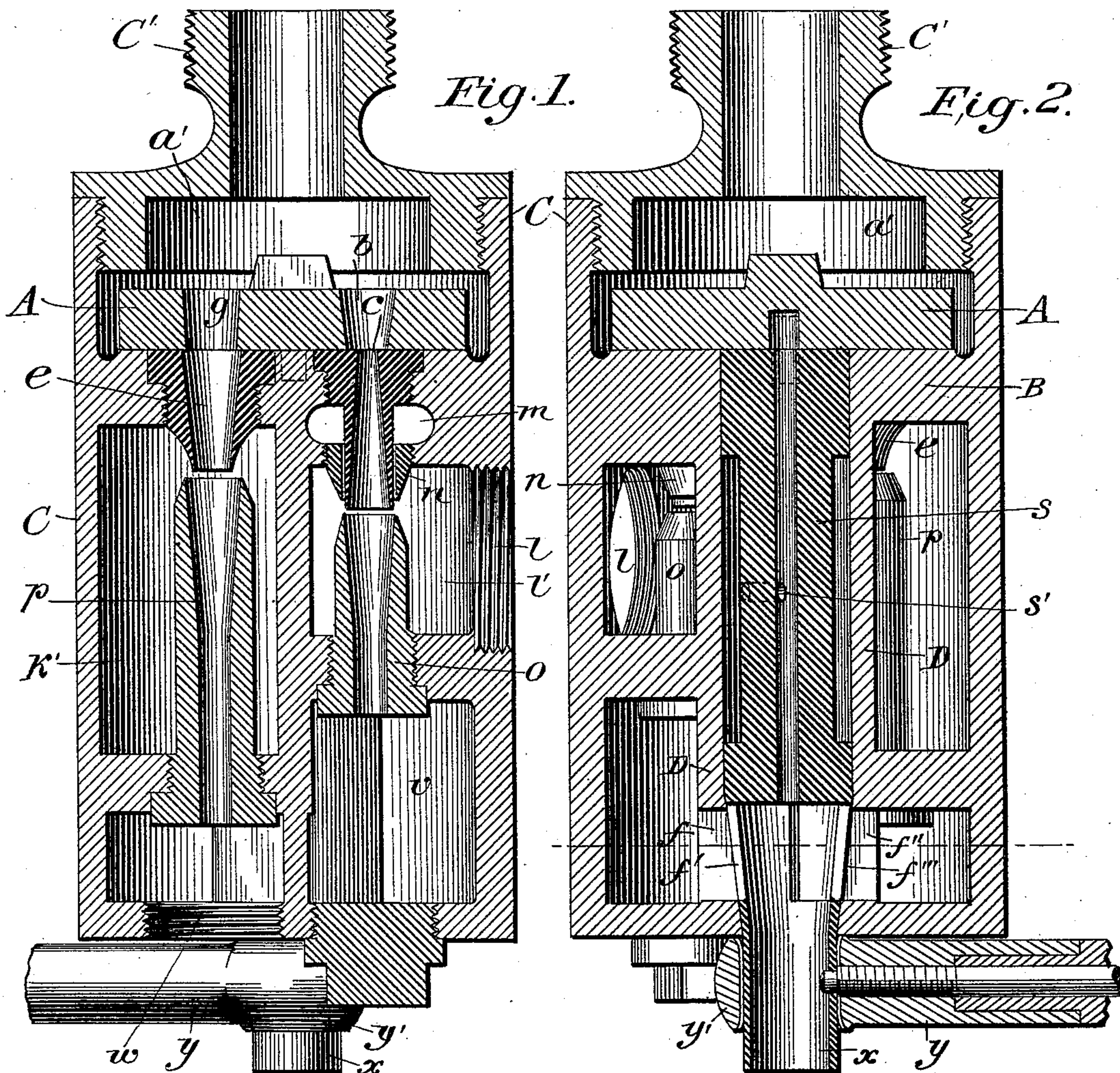
(Model.)

2 Sheets—Sheet 1.

B. BRETT.
INJECTOR.

No. 540,574.

Patented June 4, 1895.



Witnesses:
W. I. Beach
Henry Means

Inventor:
Burt Brett.

(Model.)

2 Sheets—Sheet 2.

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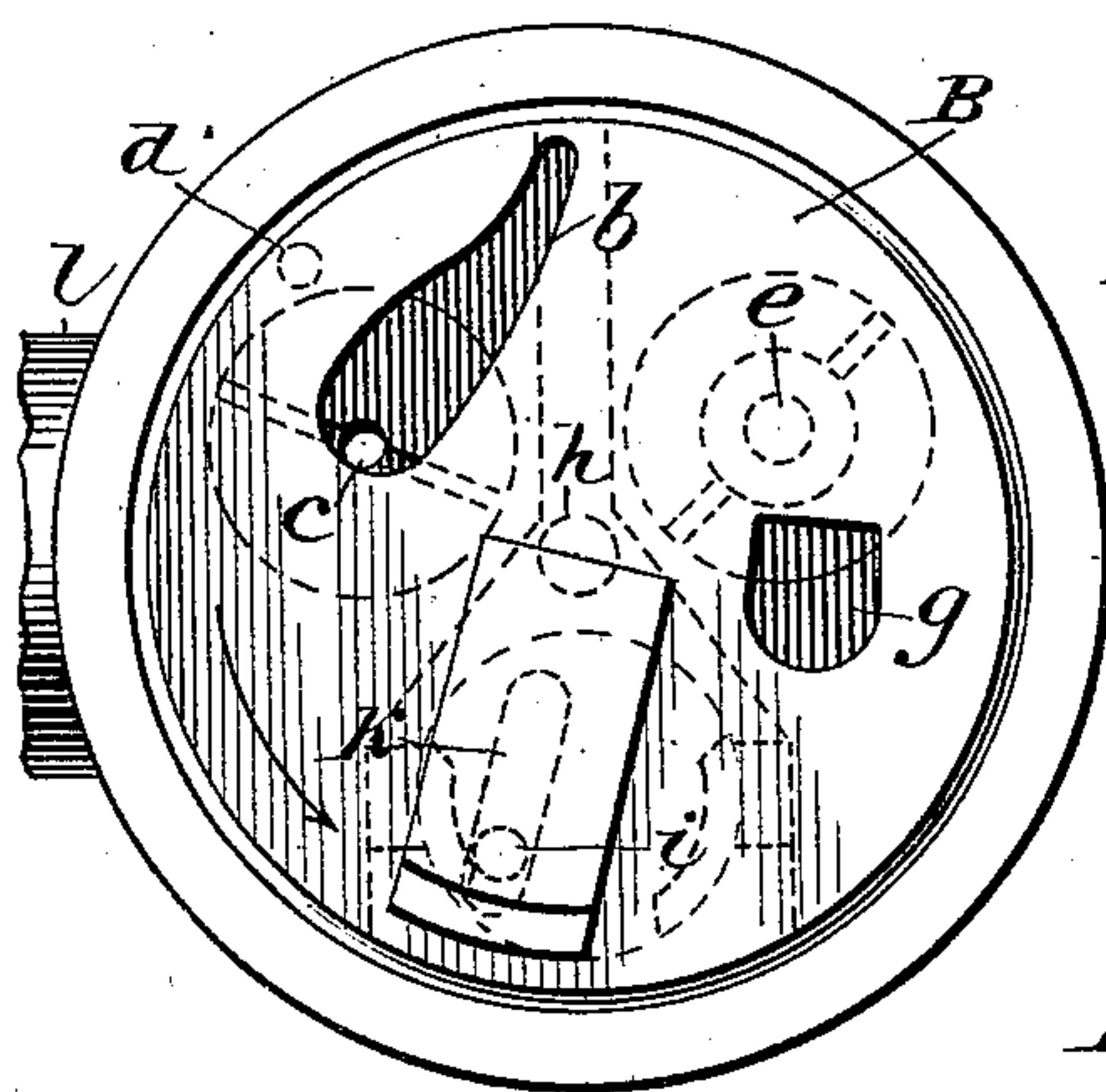


Fig. 4.

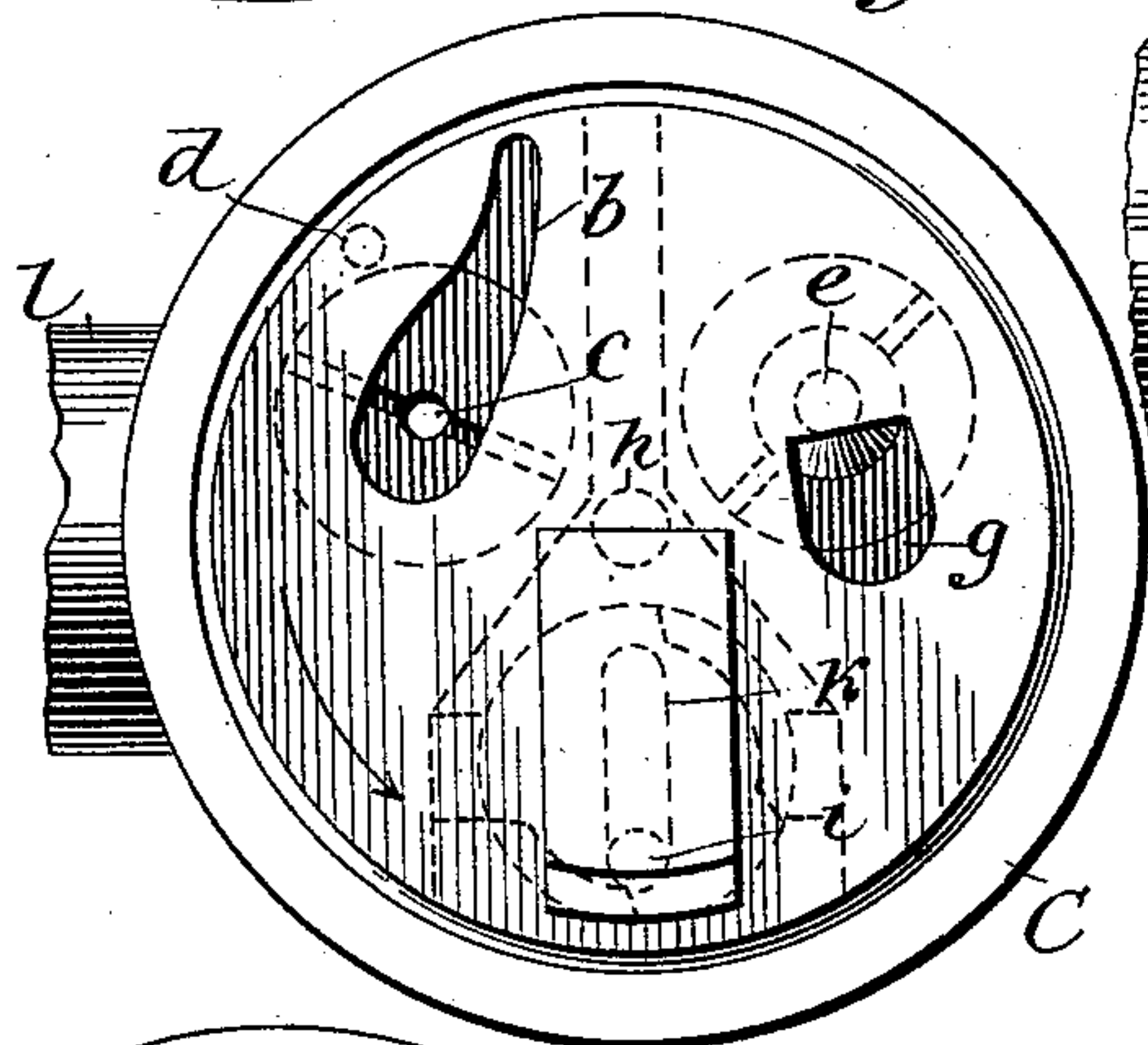


Fig. 5.

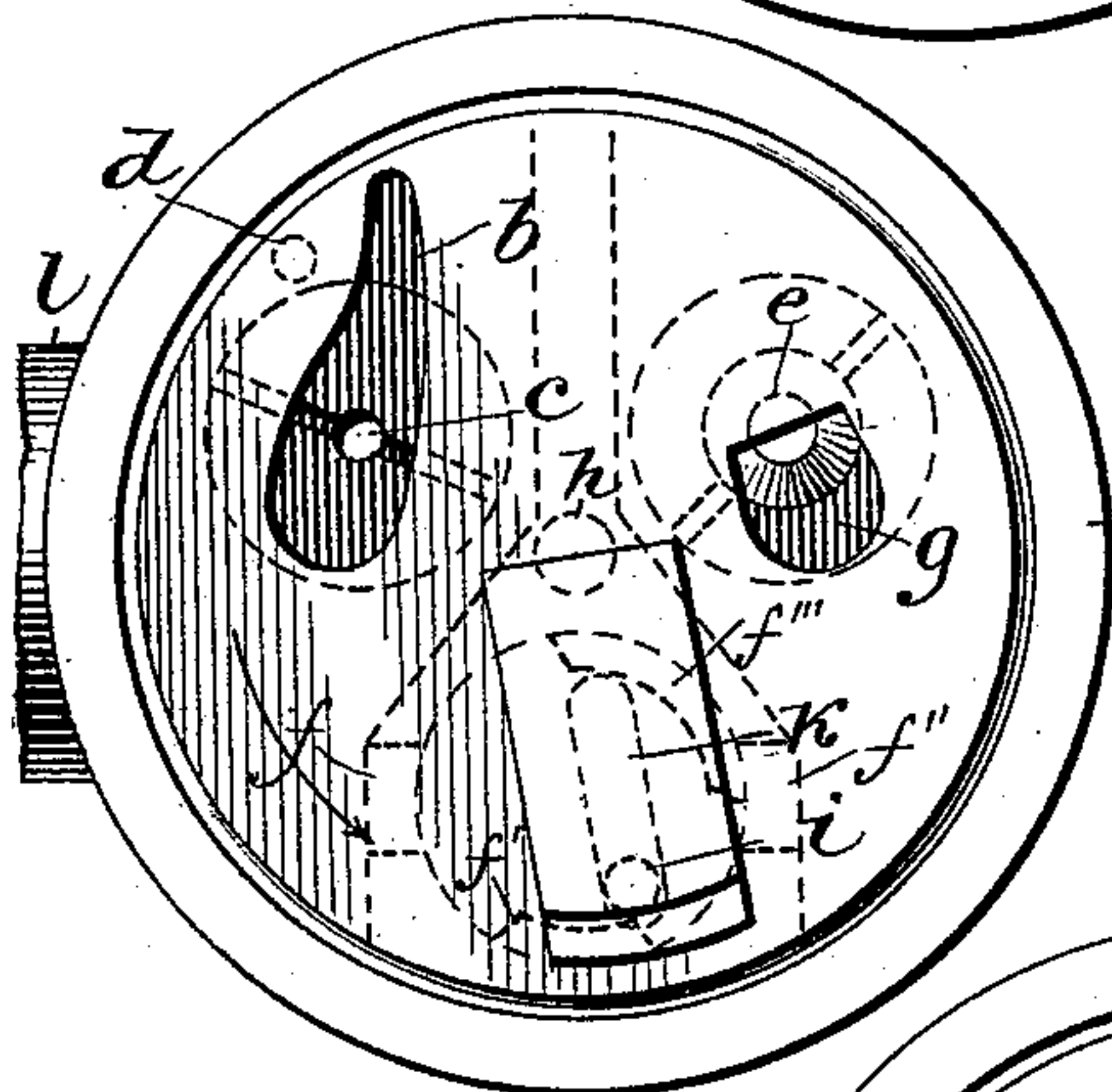


Fig. 6.

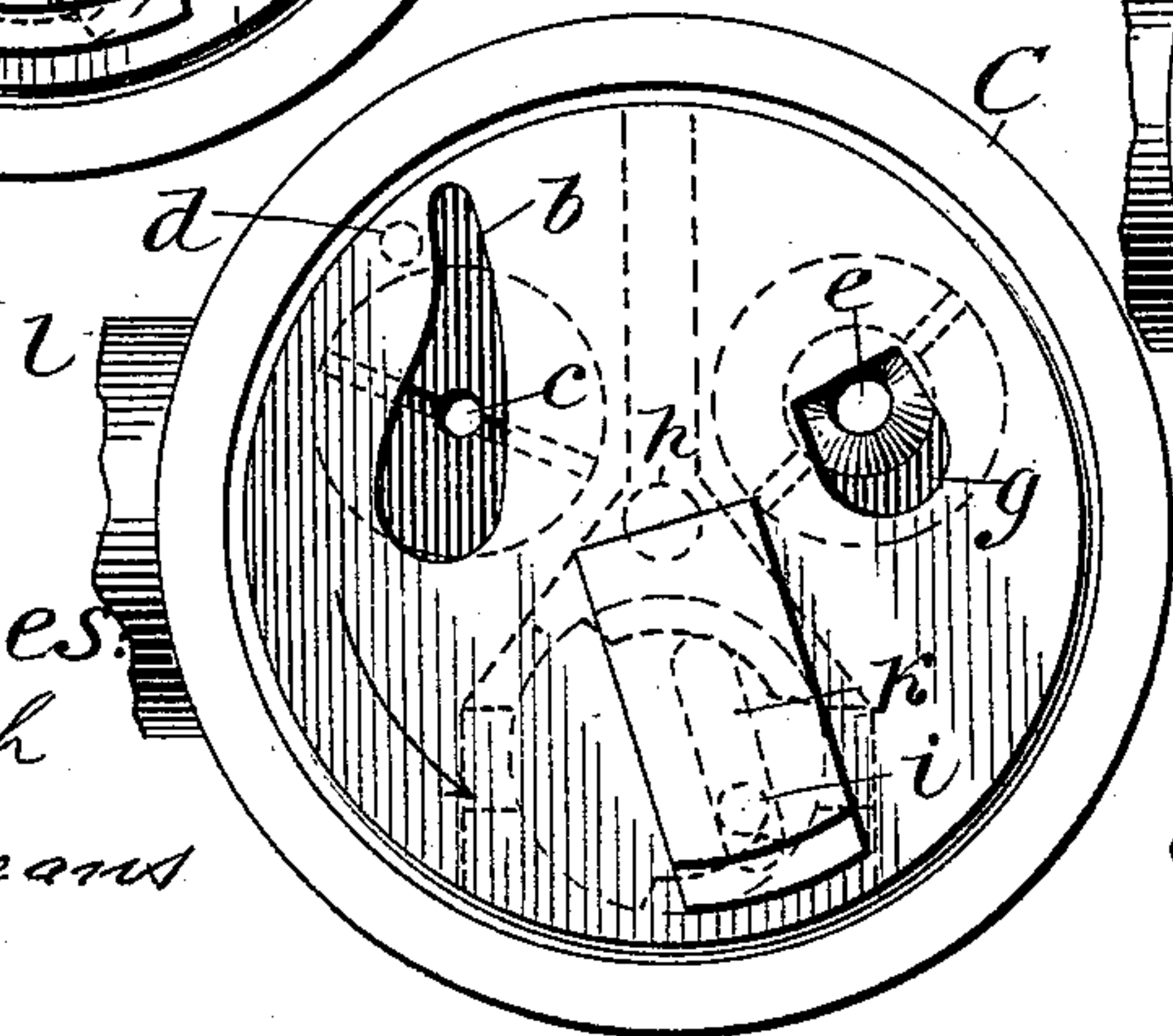


Fig. 7.

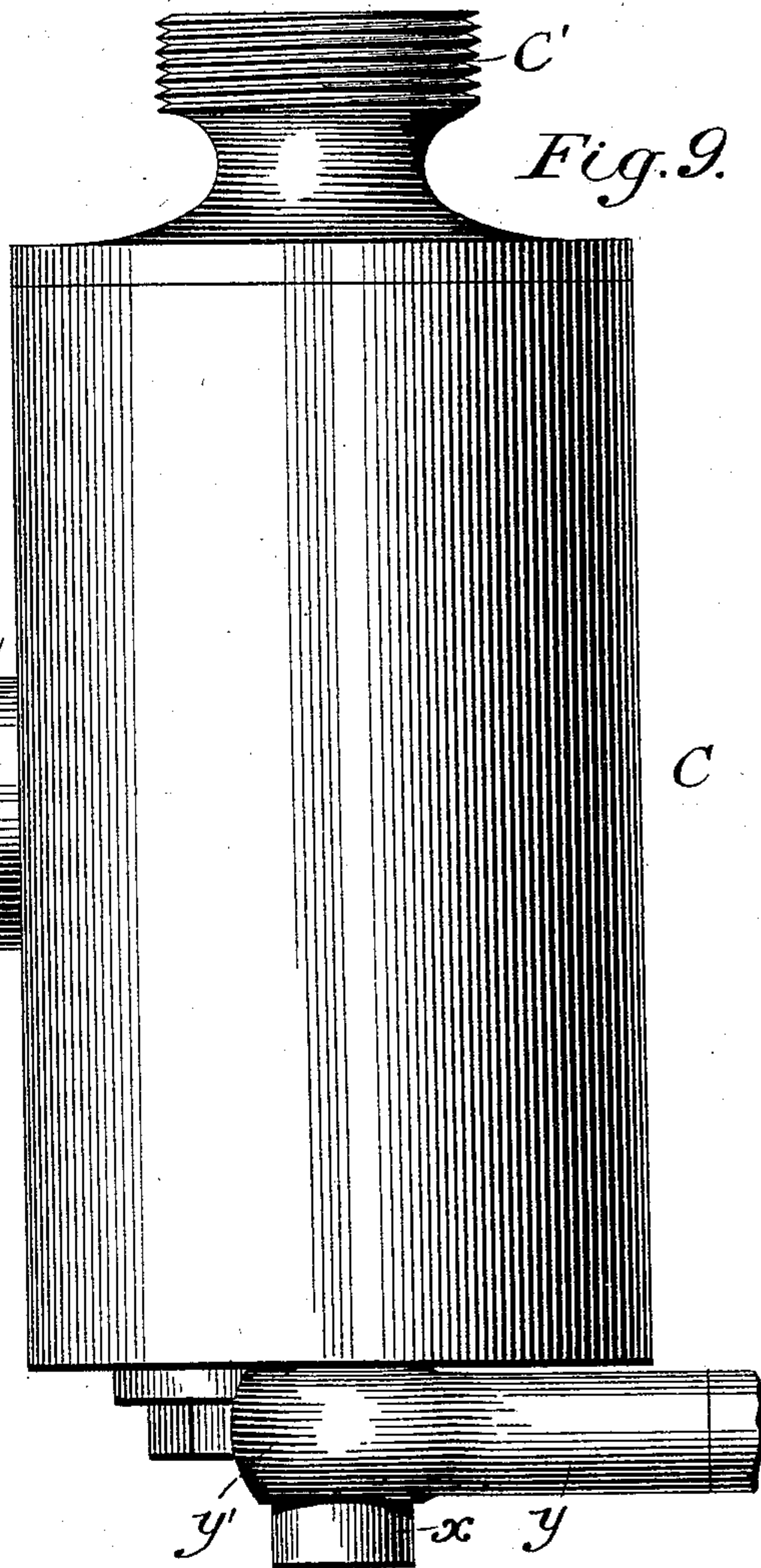


Fig. 9.

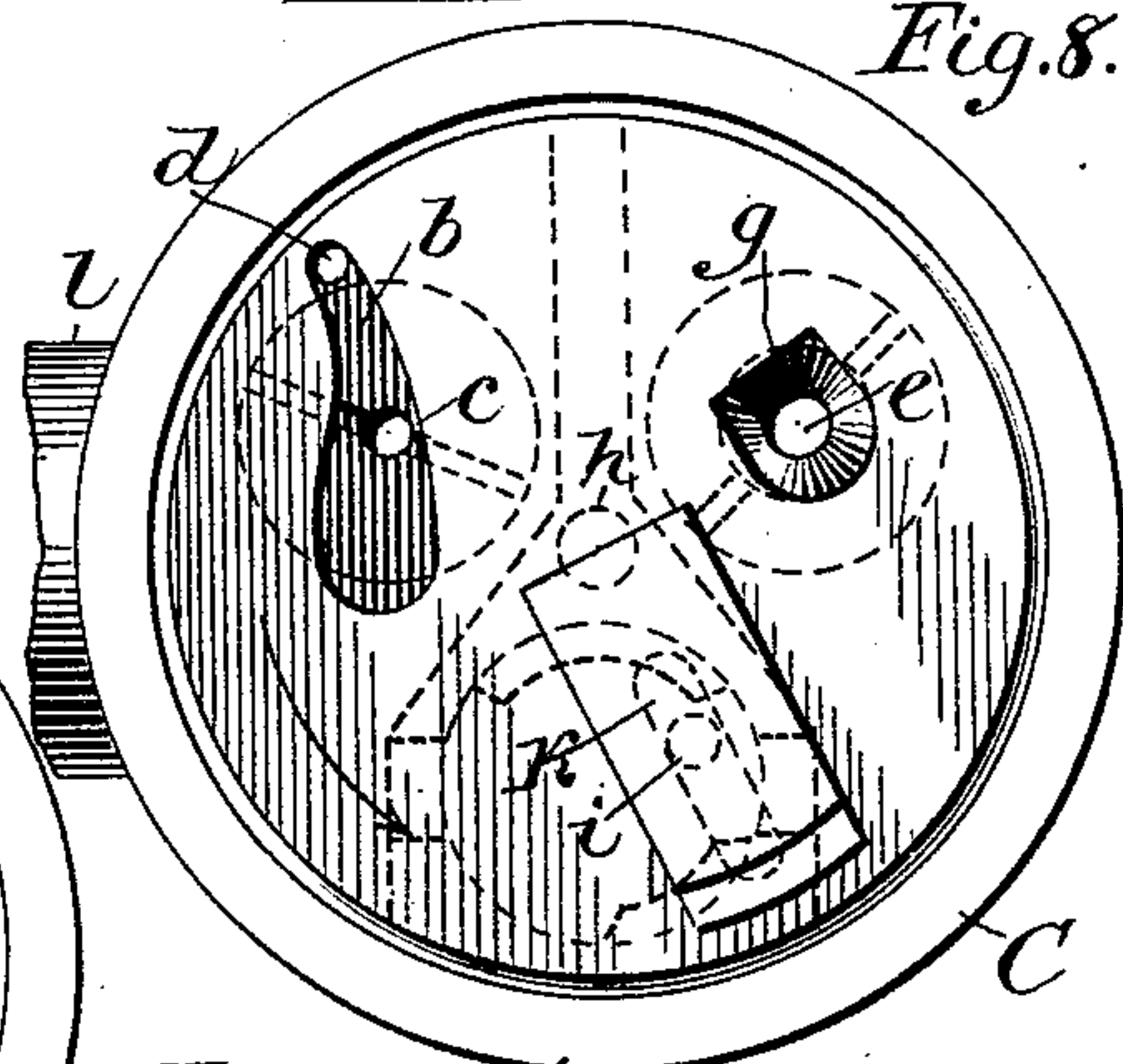


Fig. 8.

Witnesses:
W L Beach
Henry Means

Inventor:
Burt Brett.

UNITED STATES PATENT OFFICE.

BURT BRETT, OF GENEVA, OHIO.

INJECTOR.

SPECIFICATION forming part of Letters Patent No. 540,574, dated June 4, 1895.

Application filed June 22, 1894. Serial No. 515,356. (Model.)

To all whom it may concern:

Be it known that I, BURT BRETT, a citizen of the United States, residing at the village of Geneva, in the county of Ashtabula and State of Ohio, have invented a new and useful Improvement in Injectors, of which the following is a specification.

My invention relates to improvements in injectors of that class in which two steam jets and two sets of nozzles are employed; one of which jets and one set of nozzles are employed to lift water from a well or other reservoir or source of supply and convey the same into a chamber of the injector; and the other jet and set of nozzles connected with the same receive and convey and force the water into the boiler.

The objects of my improvements are, first, to simplify the construction and movements of the machine; second, to provide facilities for increasing the quantity of water delivered by the injector to the boiler, at will. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a vertical section of the machine through the axes of the lifting and forcing nozzles. Fig. 2 is a vertical section, parallel with the section in Fig. 1, through the axis of motion of the spindle by which the machine is operated. Fig. 3 is a plan view of the circular seat upon which the steam-valve revolves, showing the entrances into the sets of nozzles and the peripheries of sections of the spindle and ports of the same. Figs. 4, 5, 6, 7, and 8 are diagrams showing the ports of the steam-valve and spindle and their relative positions as the movements of the valve and spindle progress, commencing with the admission of steam lifting water and ending with admission of steam to the increase-nozzle. Fig. 9 is a perspective view of the entire machine. Fig. 10 is a sectional view through the ports of the spindle.

Similar letters refer to similar parts throughout the several views.

The circular steam valve A, is seated upon the circular seat B, which is also a diaphragm separating steam chamber *a'* from chambers *i'* and *k'*; admits the steam to the steam nozzles *c* and *e* under it, and is operated by the pin *i* in the top of the spindle S, which moves radially in a slot K in the under side of the

valve as the spindle turns in its inclosure D and the valve rotates on its axial pin *h*.

The elongated port *b* in valve A admits steam to lifting nozzle *c* in every position of the valve; and when the valve is rotated sufficiently in the direction indicated by the arrows the right extreme of port *b* of the valve admits steam to increase port *d*, greatly increasing the flow of water through the lifting nozzles, also increasing the pressure into the force nozzles and increasing the delivery of water to the boiler.

The action of the instrument is similar to the action of other instruments which employ double jets and nozzles; and further explanation of the action of the machine herein described is not necessary to enable persons skilled in the use of steam to understand the action aforesaid; also inspection of the diagrams showing the relative positions of the ports of the steam valve and the corresponding entrances of the sets of nozzles as well as the ports of the spindle and corresponding ports of the inclosing chamber of the spindle, will enable skilled persons to understand and make use of the same.

The spindle is provided with ports, *f'* on the left side and *f'''* on the right side, and the inclosure D with corresponding ports *f* on the left side and *f''* on the right side, by means of which steam and water escape from the chambers *v* and *w* in rear of the nozzles into the interior of the spindle and thence from the spindle into the waste receptacle usually employed for the overflow of injectors.

The spindle is provided with a handle *y*, attached immediately below the shell of the injector, the hub of the handle inclosing the spindle, and expanded in the interior of the hub next to the shell, and also fluted in the interior, permitting water escaping around the spindle to flow through the interior of the hub along and from the spindle, avoiding the troublesome drip of water over and from the handle, when the spindle is not perfectly fitted to its inclosure.

The spindle is conical in form at the ports and a short distance above and below them, and is inclosed in an inclosure D also conical at the ports and a short distance above and below them, the same as the form of the spindle, by means of which the spindle, being free

to move longitudinally in other parts, is tightly seated at the ports by the weight of the spindle as well as by a slight degree of pressure by steam escaping upon it under the valve.

For the purpose of avoiding injurious pressure of steam upon the spindle, though small in quantity escaping by a valve constructed with ordinary skill, a small outlet *S'* is drilled into the interior of the spindle from above the conical part, permitting the steam and water accumulating in the inclosure to escape through and from the spindle.

In starting the instrument steam is admitted by an ordinary valve above the instrument; the handle being at the left extreme of its revolution and remaining the same until the appearance of water at the overflow. The handle will then be turned toward the right until the overflow from the spindle ceases, when the action of the instrument is established. In case an increase of quantity of water delivered is desired, the revolution of the handle to the extreme right will open the increase jet and increase the quantity of water delivered in a great measure.

The forms and relative proportions of the steam jets and nozzles employed in the machine herein described are similar to the same elements employed in double jet injectors in general use, excepting in the devices for the special purposes described.

Increase port *d* supplies steam to increase chamber *m* and increase nozzle *n* surrounding lift nozzle *c*. The steam issues in a thin annular jet around the point of lift nozzle *c* and within the entrance of combining lift nozzle *o* causing great acceleration to the flow of water through it.

This machine is rendered simple and compact, and simple in its movements, using only one lever.

I am aware that others have in use devices by which steam is admitted and overflow ports operated by the use of one handle or lever. I do not therefore claim broadly the use of one handle or lever for said purposes; but

I do claim and desire to secure by Letters Patent of the United States—

1. In an injector employing two sets of steam jets and nozzles, one set to lift water and the other set to force the same into the boiler, the combination of the circular steam valve *A*, revolving on central pin *h*, in steam chamber *a'*, on the plain circular seat *B*, and provided with steam ports *b* and *g*, with lift nozzle *c*, force nozzle *e*, steam port for increase *d*, chamber *m* and increase nozzle *n*, with combining lift nozzle *o* and combining force nozzle *p*, constructed, arranged and operating substantially as described.

2. In an injector employing two sets of steam jets and nozzles, one set to lift water and the other set to force the same into the boiler, the combination of the circular steam valve *A*, revolving on central pin *h*, in steam chamber *a'* on the plain circular seat *B*, and provided with steam ports *b* and *g*, with lift nozzle *c*, force nozzle *e*, steam port for increase *d*, chamber *m*, increase nozzle *n*, with combining lift nozzle *o*, combining force nozzle *p*, with spindle *S* inclosed in chamber *D* with free bearing at upper end of said chamber and conical bearing in said chamber at ports in said chamber, said spindle provided with pin *i* in top of spindle engaging a radial slot *k* in the under side of valve *A* and causing said valve to revolve on its seat by the revolution of the spindle, said spindle provided with ports *f'* and *f'''*, and inclosure *D* provided with corresponding ports *f* and *f''* communicating with water chambers *v* and *w*, and exit chamber *x* in the lower end of spindle *S*, said spindle also provided with handle *y*; all constructed, arranged and operating substantially as described.

3. In an injector employing two sets of steam jets and nozzles, one set to lift water and the other set to force the same into the boiler, the combination of the circular steam valve *A*, revolving on central pin *h*, in steam chamber *a'* on the plain circular seat *B* and provided with steam ports *b* and *g*, with lift nozzle *c*, force nozzle *e*, steam port for increase *d*, chamber *m*, increase nozzle *n*, with combining lift nozzle *o*, combining force nozzle *p*, with spindle *S*, inclosed in chamber *D* with free bearing at upper end of said chamber and conical bearing in said chamber at ports in said chamber, said spindle provided with pin *i* in top of spindle engaging a radial slot *k* in the under side of valve *A*, and causing said valve to revolve on its seat by the revolution of the spindle, said spindle provided with ports *f'* and *f'''*, and inclosure *D* provided with corresponding ports *f* and *f''* communicating with water chambers *v* and *w*, and exit chamber *x* in the lower end of spindle *S*, said spindle also provided with handle *y*; all of the aforesaid parts except the handle inclosed in shell *C*, with cap *C'*, and provided with steam chamber *a'* supply opening *l*, water chambers *v*, *w* and *w*, and suitable connections for the supply of steam and water and discharge of steam and water; all constructed, arranged, combined and operating substantially as described in the foregoing specification and the drawings, which are hereby made part hereof.

BURT BRETT.

Witnesses:

WALLACE BROWN,
CHAS. TALCOTT.