

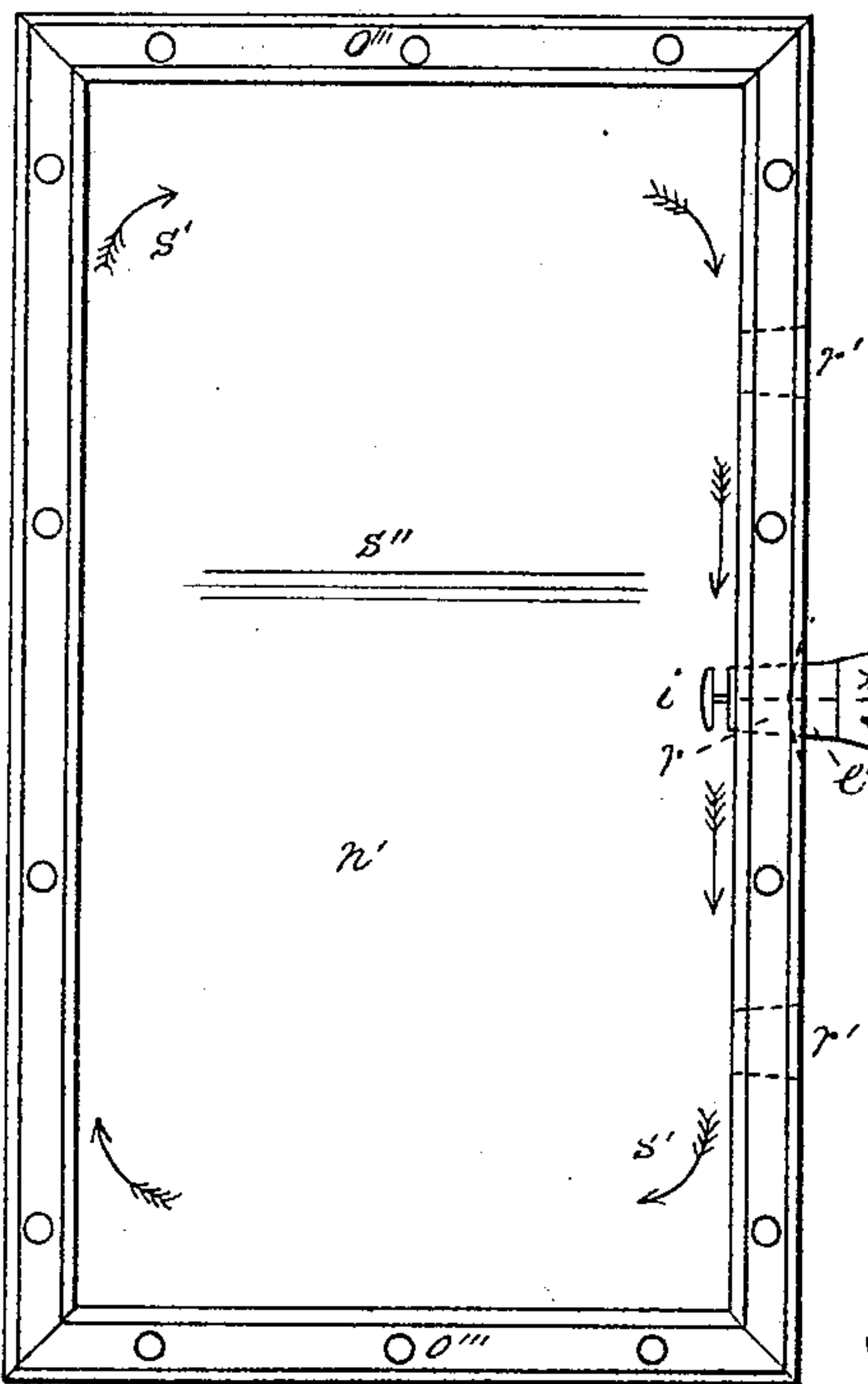
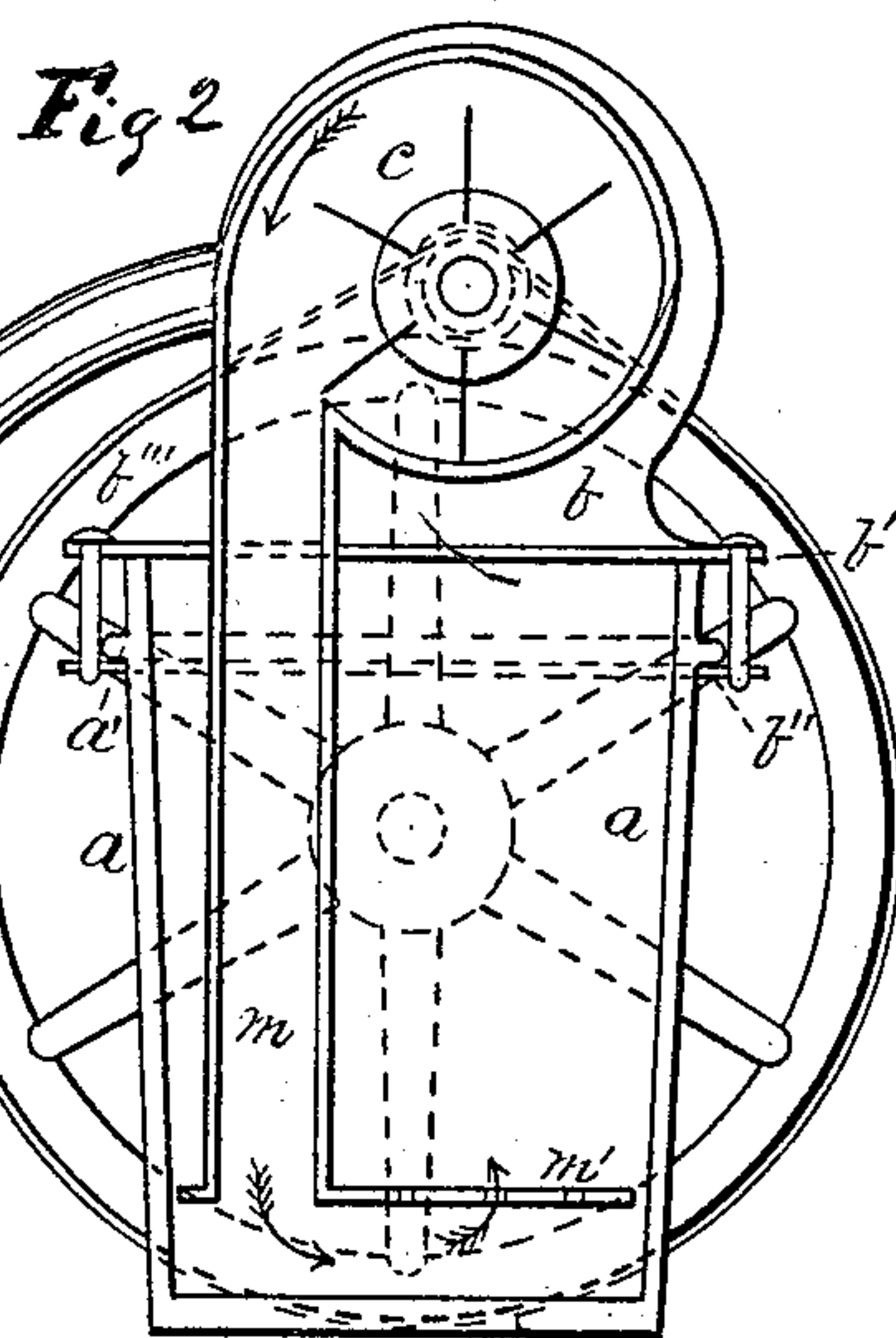
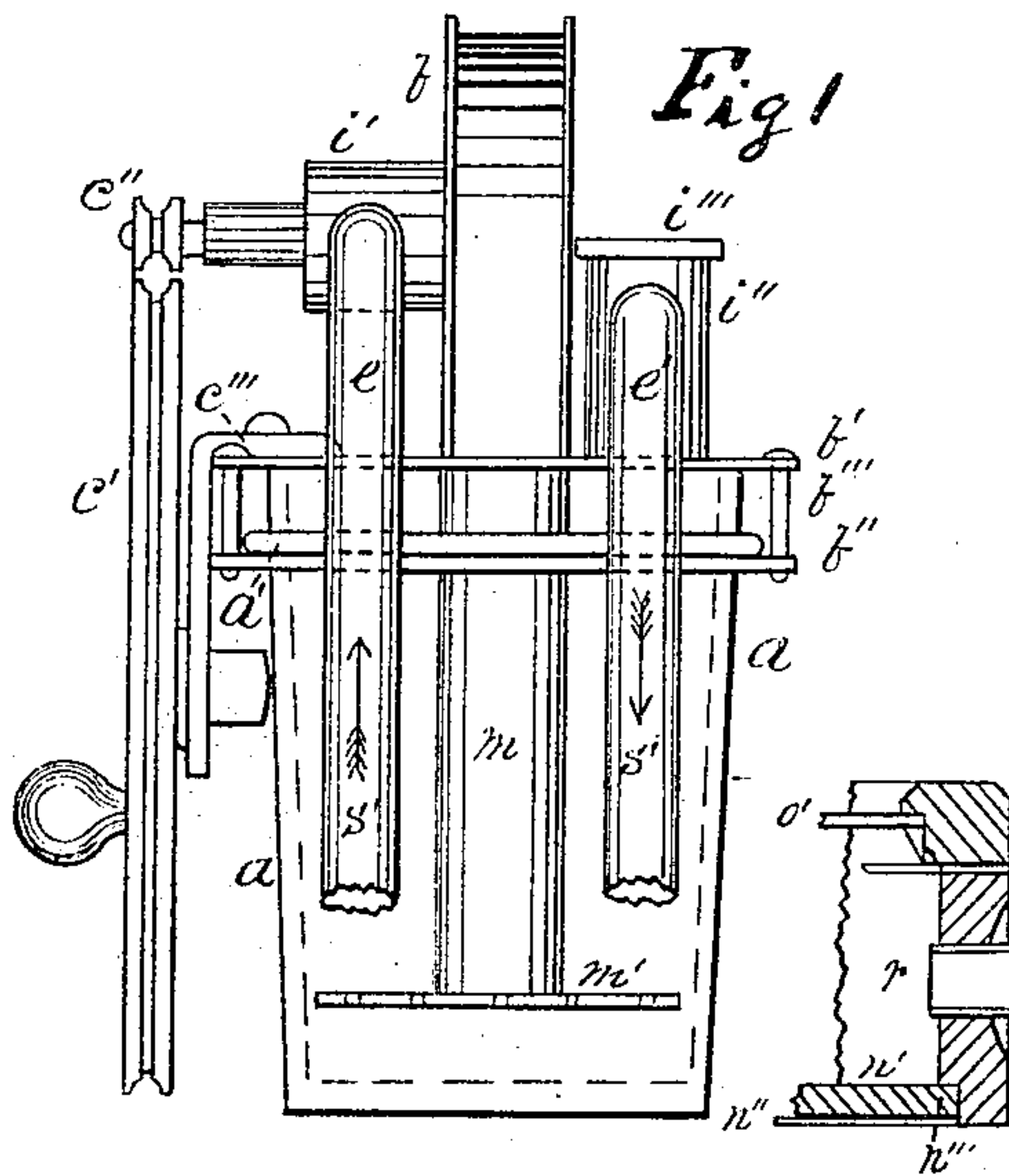
(Model.)

W. H. ELLIOT.

APPARATUS FOR PRESERVING INSECTS.

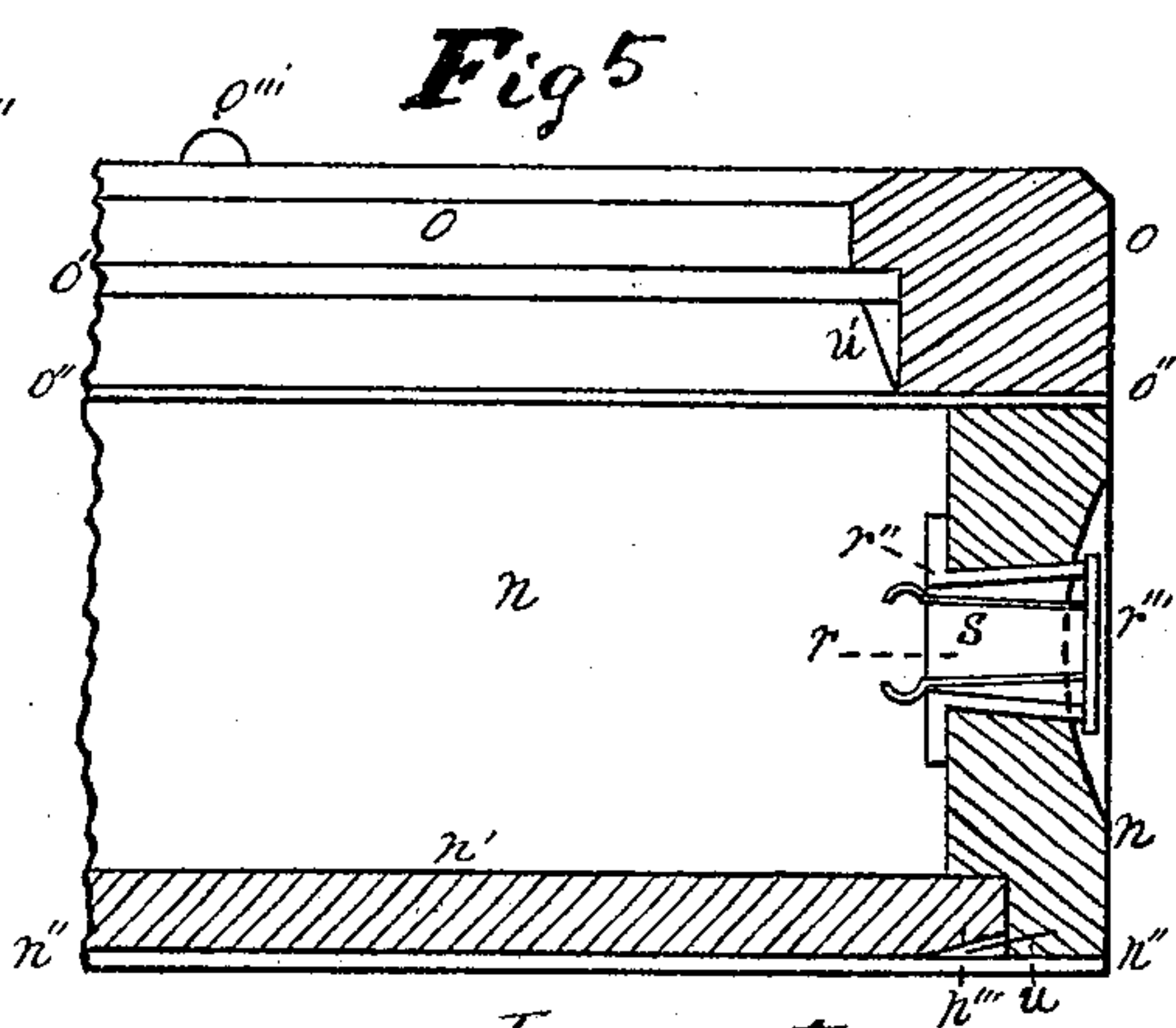
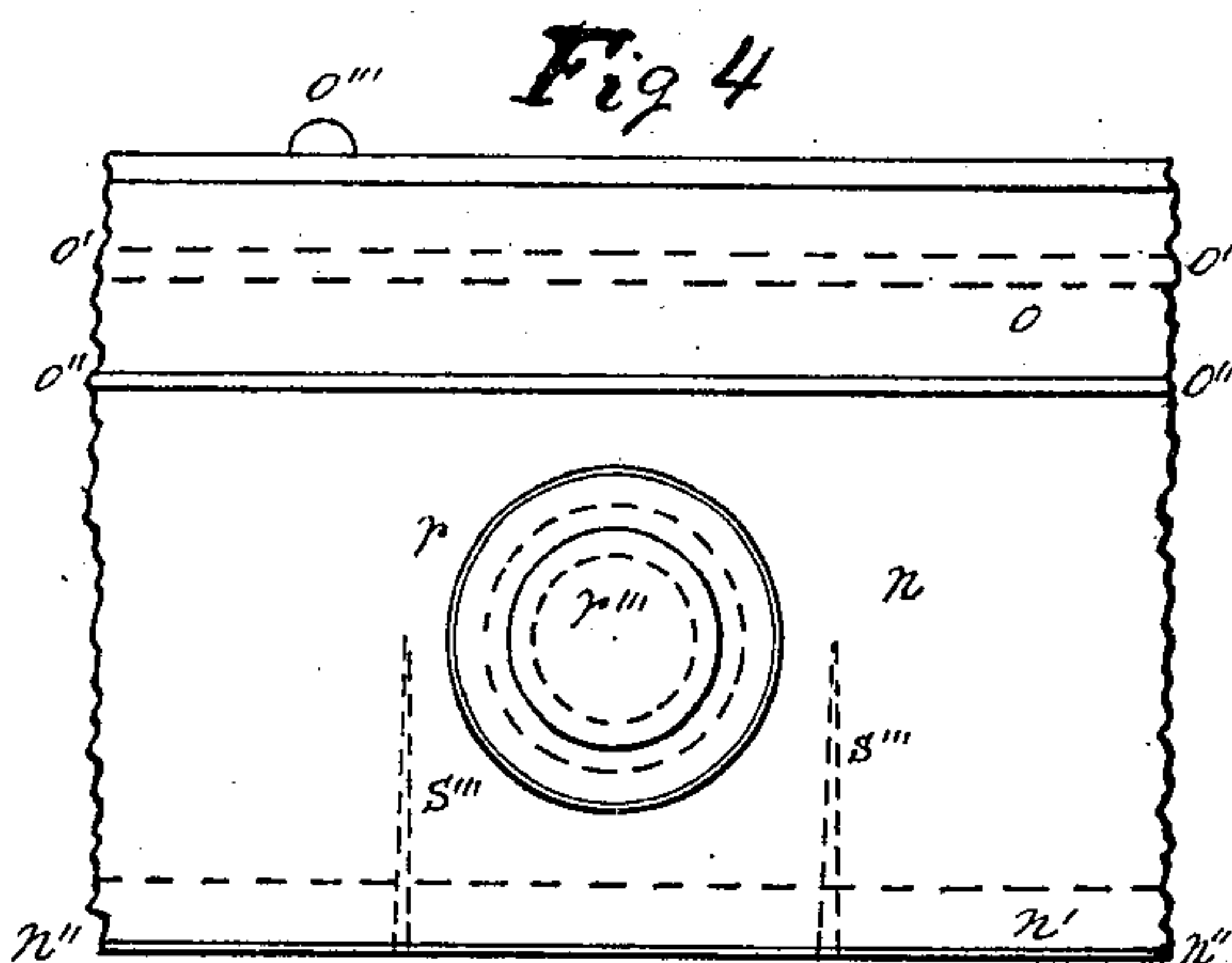
No. 248,580.

Patented Oct. 25, 1881.



Witnesses:

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Inventor:

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UNITED STATES PATENT OFFICE.

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APPARATUS FOR PRESERVING INSECTS.

SPECIFICATION forming part of Letters Patent No. 248,580, dated October 25, 1881.

Application filed March 5, 1881. (Model.)

To all whom it may concern:

Be it known that I, WM. H. ELLIOT, of the city and State of New York, have invented a new and Improved Apparatus for Preserving Insects, of which the following is a specification.

The object of my invention is to provide a more reliable and more practical apparatus for preserving insects than any now in use; and the nature of my invention consists in providing an entomological case, or case for preserving insects, with two bottoms, one to secure the air-tight condition of the case, the other to support the contents of the case, the latter being fastened at the middle of its sides in such a manner as to leave the ends free to slide back and forth as it shrinks or swells by the change of the atmosphere; in providing a poisoned air-tight packing between the cover and the lower part of the case; in providing an opening or aperture through the side of the case for the purpose of introducing poisons in any form; and in employing a blowing apparatus having in connection with it a chamber containing poisons for the purpose of medicating or charging the air within the case with poisonous vapors, said blower being provided with a nozzle which admits of a continuous flow of air in both directions.

Figure 1 is a front elevation of an air pump or blower. Fig. 2 is a vertical section of the same, showing a portion of a case. Fig. 3 is a plan of an entomological case and the nozzle of the blower. Fig. 4 is a front elevation of a portion of a case, showing the opening and plug. Fig. 5 is a vertical section of a portion of a case, showing an opening and a plug.

a is a glass jar or chamber, which supports the blower or pump *b*; *a'*, flange of the jar; *b'*, bed of the blower, resting on the top of the jar; *b''*, collar on the jar under the flange; *b'''*, screws which fasten the bed *b'* to the jar; *c*, rotating fan; *c'*, fly-wheel, which by belt-connection with pulley *c''* on the fan-shaft gives movement to the fan; *c'''*, bracket on the bed *b'*, which supports the fly-wheel; *e*, induction pipe or passage; *e'*, eduction-pipe; *e''*, double nozzle; *e'''*, partition dividing the nozzle into two passages; *i*, shield on the end of the nozzle; *i'*, drum on the side of the blower to receive the air from the induction-pipe; *i''*, feed-cylinder

through which the jar is charged, provided with a screw-cap, *i'''*; *m*, conducting-pipe on the blower; *m'*, perforated plate; *n*, frame of the case; *n'*, loose bottom of the case; *n''*, air-tight bottom; *n'''*, rabbet in the frame for the loose bottom; *o*, top frame or cover of the case, provided with the glass *o'* and soft packing *o''* between the frame and cover; *o'''*, screws which hold the frame and cover together; *r* and *r'*, openings through the side of the frame; *r''*, lining of the opening *r*; *r'''*, plug provided with springs *s*; *s'*, arrows showing the direction in which the air moves; *s''*, lines showing the direction of the grain of the wood composing the loose bottom; *s'''*, nails in the middle of the loose bottom; *u*, glaziers' tacks for supporting the loose bottom; *u'*, putty for fastening the glass.

My invention refers to the construction and condition of entomological cases and the means of producing and maintaining the necessary conditions in the same.

All entomologists, sooner or later, have the mortification of seeing their collections attacked by mites and other microscopic insects which, in the form of eggs, larvæ, or the perfect insect, have been inclosed in the case with the specimens they designed to preserve, or have found their way in, after the cases have been finally closed, through openings carelessly left when they are constructed. In this way the work of patient and persistent labor of years is often destroyed before the presence of these little pests is suspected.

To remove this obstacle to the successful preservation of an entomological collection two important features in the apparatus have to be attained: first, an air-tight entomological case simple in its construction and management, and, second, simple and practical means of passing the air within the case through poisonous substances until it becomes so charged with the poison as to cause the instant death of any insect that breathes it.

To this end I construct my apparatus as follows:

The frame *n* is rectangular, about twenty-five inches in length by fifteen in width, and is composed of clear well-seasoned pine lumber one and three-fourths inch in width by half an inch in thickness, the lower inner corner of

which is rabbeted out for the reception of the loose bottom, as seen at n''' , Figs. 1 and 5. The loose bottom n' should be composed of the same kind of lumber and about one-fourth of an inch in thickness, and so cut as to bring the grain of the wood crosswise, as represented by lines s'' , Fig. 3. The bottom is nailed in by two nails, s''' , on each side, at the middle of the case. The ends of the bottom may be fastened by glaziers' tacks u , in the same manner that window-glass is fastened. When shrinkage occurs, the middle of the bottom being fastened by nails, the two ends draw out of the rabbets a little, sliding under the glaziers' tacks or other fastenings. In addition there is an air-tight bottom, n'' , composed of strong air-tight paper or cloth, or a combination of paper and cloth, glued to the lower edges of the frame all around, but not to the loose bottom. This construction allows the loose bottom to shrink or swell longitudinally, or in the direction of the length of the frame, without disturbing the air-tight condition of the case. As the grain of the wood composing the bottom runs across the case, it does not shrink or swell in a lateral direction.

The upper frame, o , forming a part of the cover of the case, should be composed of well-seasoned black walnut or other fine wood. This frame is also rabbeted out for the reception of a sheet of glass, o' , which is fastened with putty in the usual way, as seen at u' , Fig. 5, thus making the cover transparent.

The upper and lower parts of the case are fastened together by wood-screws o''' . If, however, it should become necessary to open and close the case frequently, small bolts, with properly-fitted nuts, should take the place of wood-screws.

Between the cover and the lower frame I place a thick soft packing, o'' , saturated with a solution of arsenic or cyanide of potassium, to prevent small insects from eating their way through it. For this purpose I prefer a strip of very thick soft blotting-paper, which, with the other means mentioned, will make a case so near air-tight that without pressure there will be no circulation of air through the joints, and when the air within has once been thoroughly poisoned it will remain for months an impossible habitation for living insects. When the case is finally closed all that is exposed of the bottom n'' and the soft packing o'' should have a thick coating of varnish.

I have used for loose bottoms wood covered on each side with straw-board, which, while it is rather more expensive than wood alone, stands the effects of dry and moist air better. It also holds the pins more firmly.

For the purpose of passing the air in the case through the poisoning apparatus, I employ the opening r through the middle of the side of the frame n . This may be provided with a lining, r'' , and is closed by a plug, r''' , which is held in place by the expanding springs S . A simple hole through the side of the frame,

made tapering to fit the nozzle, as seen in Fig. 2, will serve as well, if carefully made.

For a poisoning apparatus I employ a small fan-bellows, b , Figs. 1 and 2, provided with suitable conducting-passages, terminating in a double nozzle, e'' , Fig. 3. Any other means of impelling the air through the passages may serve the same purpose; but I prefer the one shown for the reason that it produces a gentle and continuous flow of air, whereas a strong and intermittent flow would break the antennæ and wings of the more delicate insects.

By reference to Fig. 3 it may be seen that the nozzle e'' is double, being divided longitudinally by the partition e''' into two air-passages, and provided with the shield i to protect the insects from injury by the flowing air. This nozzle is connected with the fan-blower by the induction-pipe e and the eduction-pipe e' . The arrows s' show the direction of the currents of air, both in the case and in the poisoning apparatus.

To prepare the apparatus for use, fill the jar above the perforated plate m' with the poisoning material, (I use cyanide of potassium,) then connect it with the case by introducing the nozzle e'' into the opening r , which makes the jar a reservoir of poison connected by suitable passages with the interior of the case. Now, by rapidly turning the fly-wheel, the following effect is produced: The fan c drives the air down the conducting-pipe m to the bottom of the jar, up through the perforated plate m' , through the poisoning material, into the charging-cylinder i'' , down the eduction-pipe e' , through the eduction side of the double nozzle into the case, where it takes the direction of the arrows, passing around the case, and, entering the induction side of the nozzle, passing through the induction-pipe e into the drum i' , and thence into the blower before the fan. In this way the air in the case is made to pass rapidly through the poisoning material until it becomes perfectly saturated with a poison that is destructive to animal life without any escape of it from the apparatus. By means of the transparent cover the effects of the poisoned air upon the living insects may be watched, so as to know positively when all insect life in the case is extinct. When the air has been sufficiently poisoned the blower may be detached and the plug inserted to keep the poisoned air from escaping. To render the joint between the top of the jar a and the bed b' air-tight, I employ a rubber packing.

By reference to Fig. 5 it may be seen that the plug r''' is sunk below the outer surface of the case, to the end that it may not come in contact with anything to disturb it.

Before the loose bottom is put in place its whole upper surface should be covered with the paper that is to be used upon it, so that when it shrinks it will not show a margin at each end.

I have shown the grain of the wood in the loose bottom running across the case. It may

be made to run longitudinally and shrink laterally with the same results.

For the purpose of making the death of the insects as painless as possible, I drop a few drops of chloroform on the cyanide of potassium before commencing operations. The insects are immediately made unconscious by the chloroform, and the cyanide keeps them so.

A sheet of glass, properly provided with packing and means of holding it down, may be made to serve the purpose of a cover without the use of an upper frame.

Having described my invention, what I desire to have secured to me by Letters Patent of the United States is—

1. In a case for preserving insects, the combination of devices substantially as follows: a frame, *n*, provided with a loose bottom which is fixed at its middle to said frame, while its ends are left free to slide, an air-tight bottom having its edges glued or cemented all around to the lower edges of the frame, and a transparent cover provided with a poisoned packing, *o''*, between it and the frame, and with suitable means of holding said cover down upon the frame, as and for the purpose specified.

2. In a case for preserving insects, the combination of devices substantially as follows: a frame, *n*, provided with a loose bottom which is fixed at its middle to said frame, while its ends are left free to slide, an air-tight bottom having its edges glued or cemented all around to the lower edges of the frame, a transparent cover provided with a poisoned packing, *o''*, between it and the frame, and with suitable means of holding said cover down upon the frame, and one or more valve-openings through the side of the frame for the ingress and egress of poisons, as and for the purpose specified.

3. In a case for preserving insects, the com-

bination of devices substantially as follows: a frame, *n*, provided with a loose bottom which is fixed at its middle to said frame, while its ends are left free to slide, an air-tight bottom having its edges glued or cemented all around to the lower edges of the frame, a transparent cover provided with a poisoned packing, *o''*, between it and the frame, and with suitable means of holding said cover down upon the frame, one or more valve-openings through the side of the frame for the ingress and egress of poisoned air, and an induction and eduction passage between said case and a reservoir of poisons, as and for the purpose specified.

4. In an entomological apparatus, the combination of devices as follows: a case for preserving insects, provided with a transparent cover, *o*, resting upon a soft packing, *o''*, one or more openings, *r*, a detachable bellows or blower provided with induction and eduction passages between it and said case, and a chamber or reservoir charged with poisons and connected therewith, whereby the air in the case may be charged with said poisons and returned to the case again without mixing with the external air, the effects of the operation upon the living insects watched, and the poisoned condition of the air in the case retained, substantially as specified.

5. In an entomological apparatus for preserving insects, constructed substantially as described, a blower provided with a reservoir of poisons and connected with a case by induction and eduction pipes *e* and *e'*, and in combination therewith a double nozzle, *e''*, provided with shield *i*, substantially as and for the purpose specified.

WM. H. ELLIOT.

Witnesses:

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