

(No Model.)

J. G. PRITCHARD.
CHURN COVER.

No. 298,889.

Patented May 20, 1884.

Fig. 1.

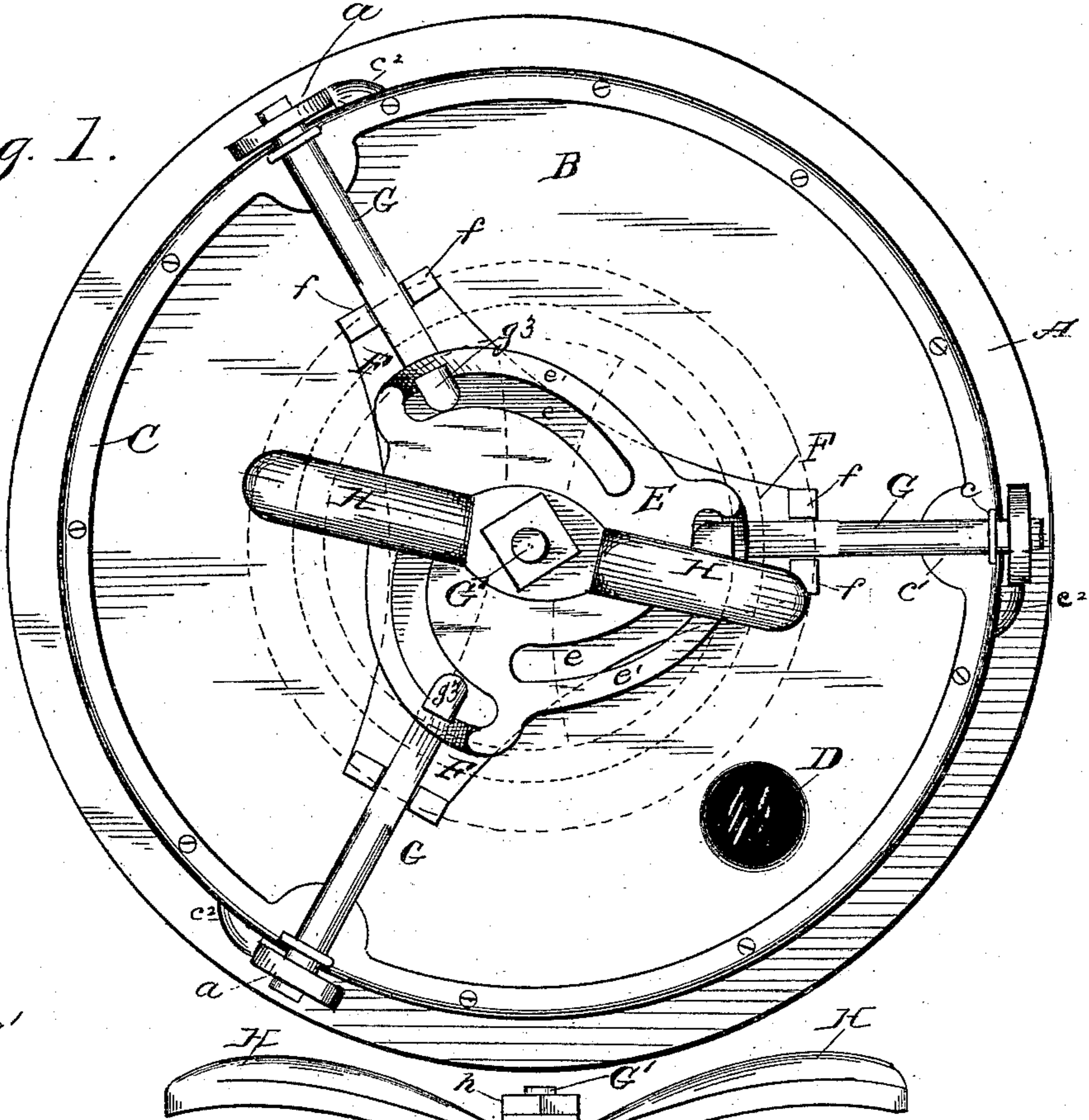


Fig. 2.

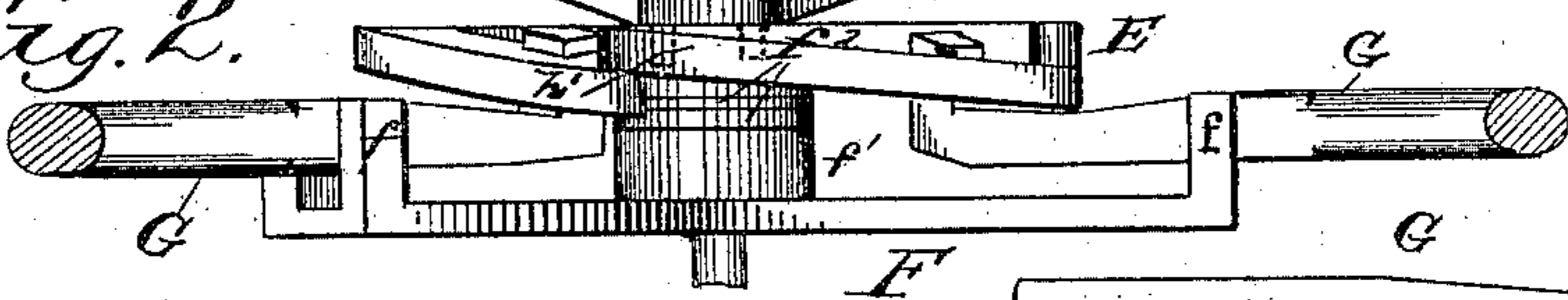


Fig. 4.

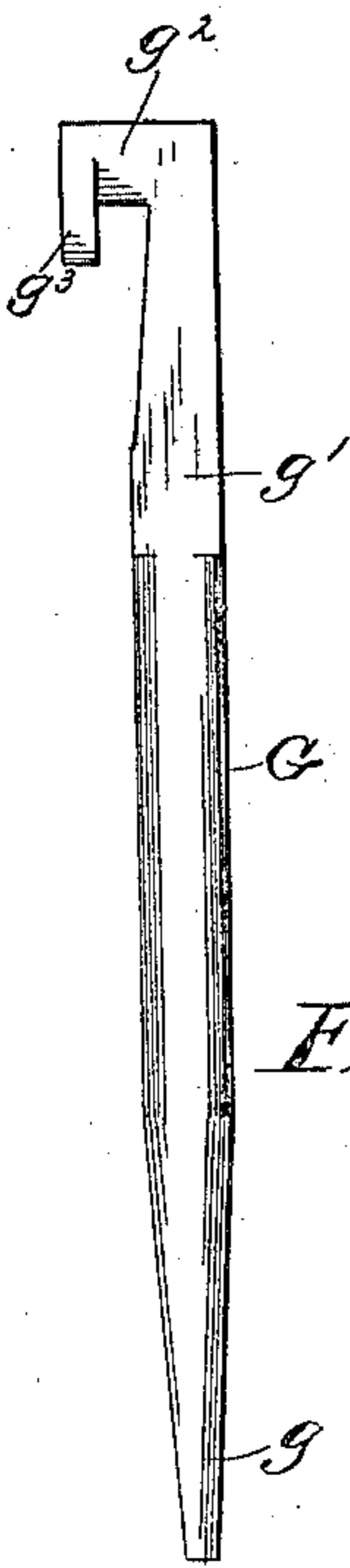


Fig. 4.

Witnesses:
Wm D. Wall
D. P. How

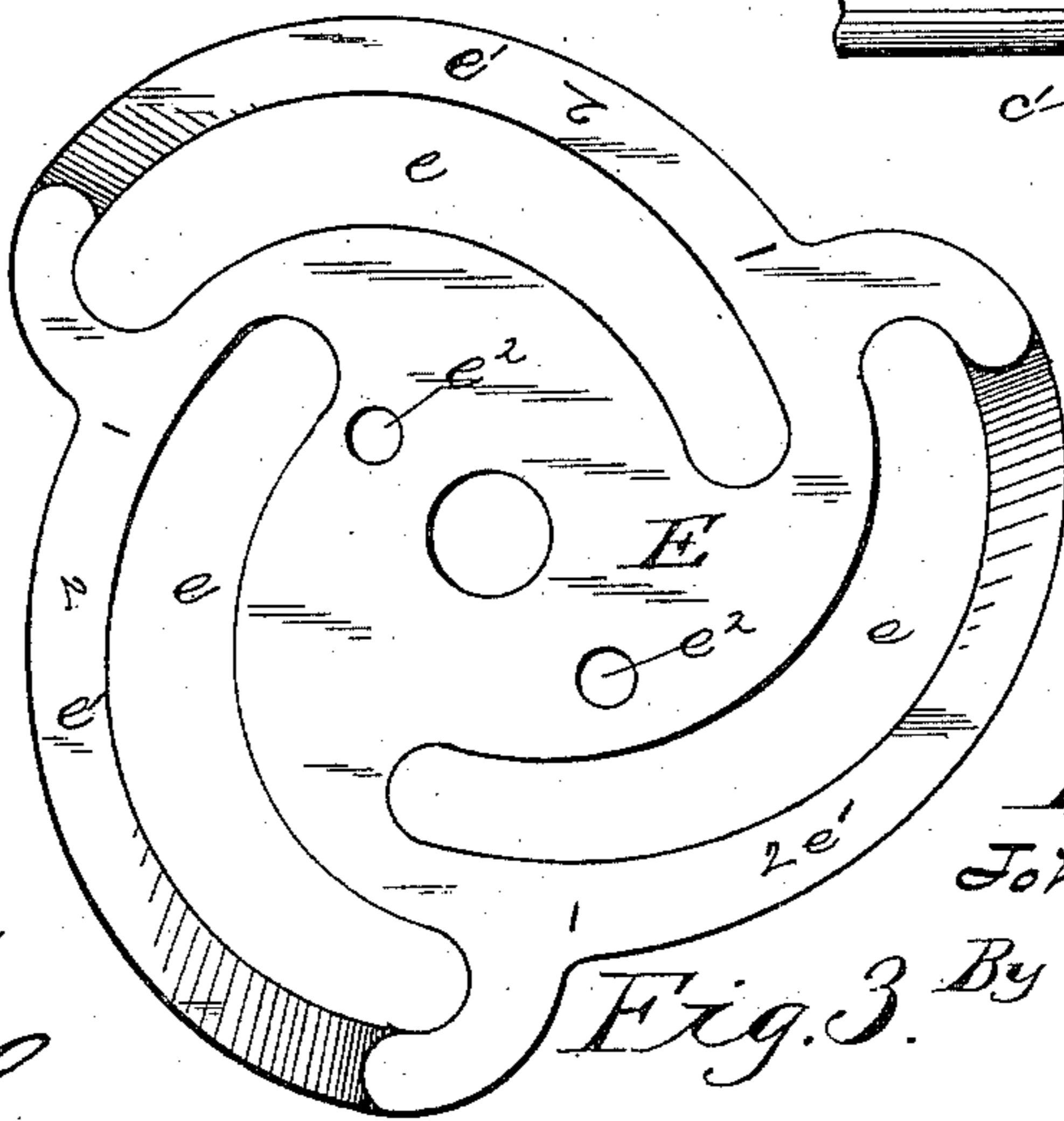


Fig. 3.

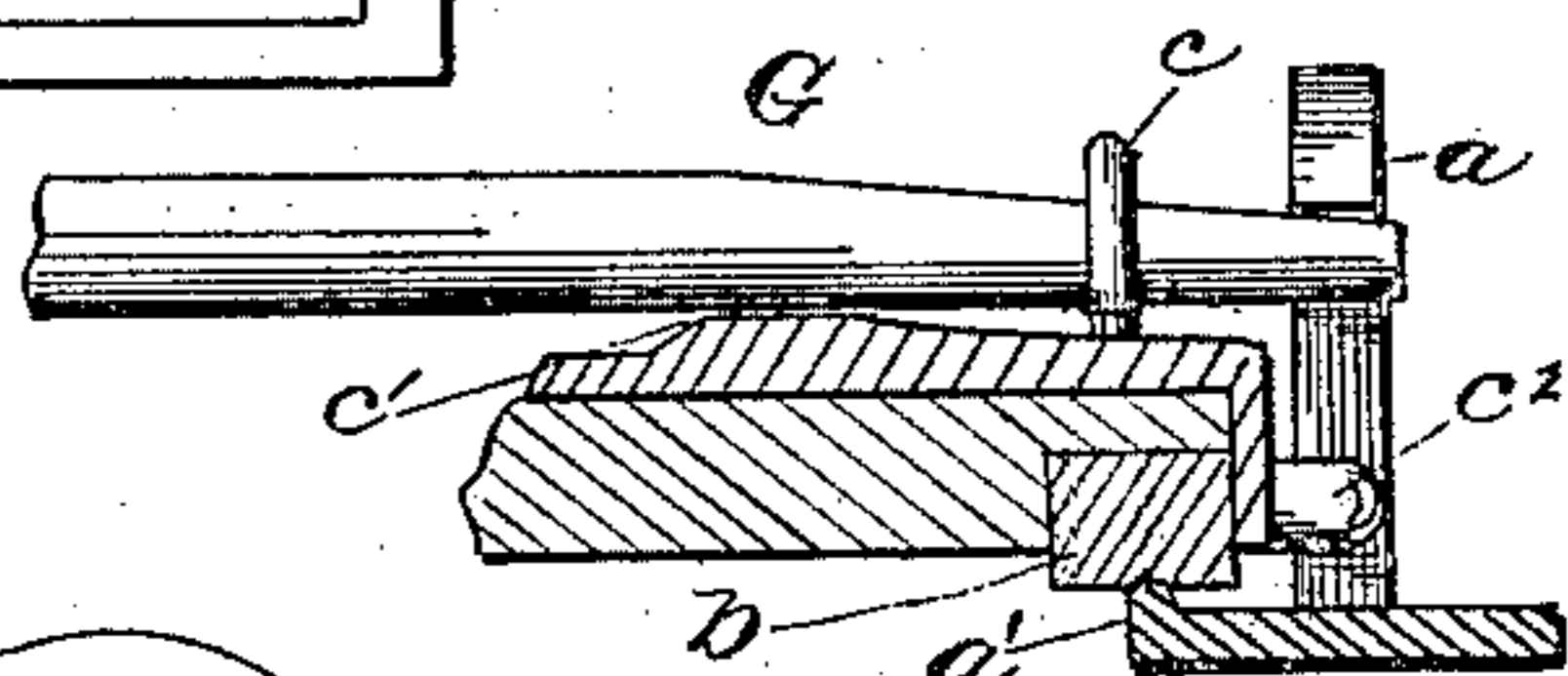


Fig. 5.

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UNITED STATES PATENT OFFICE.

JOHN G. PRITCHARD, OF POULTNEY, VERMONT.

CHURN-COVER.

SPECIFICATION forming part of Letters Patent No. 298,889, dated May 20, 1884.

Application filed March 26, 1884. (No model.)

To all whom it may concern:

Be it known that I, JOHN G. PRITCHARD, a citizen of the United States, residing at Poultney, in the county of Rutland and State of Vermont, have invented certain new and useful Improvements in Covers for Churns, Barrels, and other Vessels, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention relates to that class of heads for churns, barrels, and similar vessels which are designed for removal and replacement at will, and which are commonly used in connection with what is known as an "open-head" 15 ring, provided with ears, catches, or lugs, into which are projected radial arms, passing over and bearing upon the top of the cover proper, said arms being operated by locking means attached to the cover.

20 The object of this invention is to provide means for operating the radial locking-arms and unlocking the same by positive motion, or force positively applied, so that they shall be operated in two directions positively and 25 simultaneously in the act of locking, and also in the act of unlocking, whereby no dependence is placed upon the action of springs or gravity in the bars or any portions of the same. Other objects and advantages will appear in the following description, and the novel features of the invention will be specifically set forth in the claims.

Referring to the drawings, Figure 1 is a plan of a churn or barrel cover constructed 35 in accordance with my invention. Fig. 2 is a side elevation of the locking-arm-operating mechanism, showing portions of two arms. Fig. 3 is a plan of the compound cam employed. Fig. 4 is a side elevation of one of 40 the locking-arms; and Fig. 5 is a section of the head-ring and a portion of the cover, with a portion of a locking-bar thereon.

Like letters refer to like parts in all the figures.

45 A represents the usual open-head ring, which comprises a flat ring adapted to be bound in the staves of a cask, churn-body, or barrel at the chine, by forcing the end hoops thereof home, and is provided with a 50 suitable number of ears or catches, *a*, which may be simply perforated lugs, as shown in Fig. 1, or catches, as represented in Fig. 5,

and with an annular upwardly-projecting rib or bead, *a'*, the purpose of which is that it may be embedded in any suitable packing 55 arranged upon the lower surface of the cover. The cover proper consists of a wooden main portion, B, bound by a metallic ring, C, and provided at its periphery with any suitable flexible packing, *b*. A window, D, as herein 60 shown, is set in the cover. The binding-ring is provided with staples *c*, agreeing in number and position with the ears or catches on the head-ring, and the said binding-ring is projected inwardly from the staples and in- 65 creased in thickness to form a fulcrum, *c'*. Lugs *c''* are formed on the binding-ring to abut against the edge of each of the ears.

The construction thus far described is usual and well known in covers of this class, and it 70 has been customary to provide locking-arms, which extend from the center of the cover, over the fulcrums, through the staples, and which are provided at their inner ends with suitable devices for depressing said inner ends 75 after they are arranged under the catches by means separate from that employed for depressing their inner ends, so as to forcibly press the cover down upon the head-ring and form a tight joint. In other constructions the 80 outer end of each of the locking-arms has been made wedge shape, as herein shown, and means have been provided at the center of the cover for forcing such arms outwardly. By the use of my improvements for operating the 85 locking-arms I simultaneously (or, if desired, successively) force them outwardly and depress their inner ends in the act of locking the same, and simultaneously draw them 90 radially toward the center and elevate their inner ends in the act of unlocking the cover, and the device by which I am enabled to perform this operation is the compound cam E, which is mounted upon the cover, connected with the radial arms, and operated by means 95 of the devices now to be described.

F represents a base, which is secured to the upper surface of the cover by any suitable means—such as screws—and which is provided, in this instance, with three radial extensions, 100 having parallel upwardly-projecting lugs *f* at each end of each of its extensions, between which lugs the radial locking-arms pass. These lugs, in connection with the staples *c*,

serve as guides for the radial arms. The base or casting F is provided with a central boss, f' , which is bored centrally and vertically for the passage of the bolt G' , which serves to

5 secure the parts in operative arrangement.

f^2 represents washers encircling the bolt and resting upon the upper end of the boss or hub f' , for a purpose hereinafter to be described.

G represents the locking-arms, the outer 10 ends, g , of each of which may or may not be beveled on its upper surface to form a wedge, and the inner end of each of which is provided with parallel sides g' , adapting that portion of the arm to the lugs f . The inner end of each 15 of the arms is also provided with a vertical projection, g^2 , of a thickness substantially equal to the width of certain grooves, hereinafter described, in the compound cam E, and of a height equal, substantially, to the thickness of certain 20 other portions of said cam, also hereinafter described, and with an overhanging projection, g^3 , whereby the inner end of each of the locking-arms is substantially hooked-shaped, certain portions of the hook having certain di- 25 mensions for designed purposes.

To return to the compound cam for further description of its characteristic features, it will be observed by reference to Figs. 2 and 3 that 30 it rests upon the upper one of the washers f^2 , and is constructed with vertical cam-grooves e , arranged with their inner ends near the center of the cam, and gradually receding from the center. The outer rims, e' , (or it may be the inner walls of grooves e ,) of the cam, while 35 forming the outer boundary of the cam-grooves e , terminate at a point in a plane common with the center of the cam, and at its upper surface at one end and at a point below said plane at the other end, so that said rims or 40 walls are in themselves cams. The cam-grooves e are of a width to receive more or less snugly the upright portion g^2 of the inner end of the locking-bars, while the extension g^3 extends such a distance from the upright por- 45 tion of the inner end of the locking-bar as to embrace more or less snugly the outer rim, e' , so that when inserted into the cam-grooves, as shown in Figs. 1 and 2, the rotation of the cam around the central bolt serves by means of the 50 cam-grooves to reciprocate the locking-bars radially, while the rims e' serve at the same time to raise and lower the inner ends of the locking-bars, these motions, radial and ver- 55 tical, of the inner ends of the locking-bars taking place in accordance with the direction of the rotation of the compound cam. Now, it will be seen that when these motions are given to the inner ends of the locking-bars the outer ends thereof are moved upon the fulcrum c' in 60 a staple, c , and into and out of the ears or catches a and against the fulcrum c' , and the under surface or aperture or opening in the ears or lugs, to produce a firm pressure of the lid upon the head-ring.

65 Although I have particularly described the relative proportion and direction of the parts

of the inner end of each locking-bar, it will be seen that absolute accuracy in fitting the parts together is not essential to securing a positive motion of the locking-bars in radial and ver- 70 tical directions, so that while an exact fit of the parts will tend to smoothness of operation, still inaccurate fitting may exist, and yet positive operation of the bars in both directions will be secured; and I therefore do not limit 75 my invention to the exact details of construction herein shown as to shape or relative size, but deem any change of construction which gives positive operation in both directions as comprehended by my invention. 80

H represents a handle which is connected to the cam by means of lugs h' , (shown in dotted lines, Fig. 2,) depending from its lower central surface into apertures e^2 in the central portion of the cam. The handle is bored for 85 the passage of the bolt G' , and a nut, h , serves to bind the parts together, the bolt G' passing, if desired, though not absolutely necessary, through the wooden portion of the cover. In- 90 stead of the handle H, a hand-wheel, as shown in dotted lines, Fig. 1, may be employed to operate the cam.

It is not essential to a satisfactory operation of my invention that the outer ends of the locking-arms should be beveled upon their up- 95 per faces, or otherwise made wedge shape, as it will be seen by reference to Fig. 1 none of the arms are wedge-shaped. It will also be seen that the disposition of the rim e' may be without the inclination shown in Fig. 2—that 100 is, may be horizontal at and along the short portions thereof, say from 1 to 2 on each section of the entire rim—so that during the first portion of the movement of the compound cam the movement of the radial arms is radial 105 only, whereby they are fairly introduced into the ears before the depression of their inner ends is effected, and fairly relieved from pressure at their inner ends before being withdrawn from the ears. By employing washers be- 110 tween the cam and the upper surface of the hub I may, after the cam or locking-arms become worn, remove a washer, and thus depress the cam in order that it may in operation de- 115 press the locking-arm to a lower point than before the washer was removed, and by the same means I am enabled to secure a tight joint between the head-ring and packing, when the latter becomes worn by constant use. The number of locking-arms, and therefore the 120 number of cam-grooves with inclined walls, may be increased or diminished, as desired.

The construction of the compound cam, as herein shown, is such that the radial and ver- 125 tical movements of the locking-arms are simultaneously produced. If desired, I may make the radial movements simultaneous or successive. Such movements will be in accordance with the relative arrangement of the cam grooves or slots e . By making the eccentricity 130 of each different from the others, those of greater eccentricity work more rapidly than

those of lesser eccentricity during the rotation of the cam, and thus successive locking-arms are successively operated. With this modified arrangement of the slots or grooves *e*, and with the rim or rim-sections *e'*, having a portion thereof horizontal, as above described, I successively force outwardly, and then successively depress or lock each radial arm.

In case the outer ends of the locking-arms are wedge-shaped, I prefer to so construct the rims of the cam that the depression at the inner end shall begin at the same time with the outward movement of the arms, and an elevation of the inner end shall begin at the same time as the commencement of the withdrawal of the outer ends from the ears or lugs of the head ring.

Having described my invention and its operation, what I claim is—

1. In a cover for churns, barrels, and other vessels, the combination, with radial locking-arms, of a compound cam adapted to reciprocate the same vertically and radially, substantially as specified.

2. In a cover of the class described, a compound cam having vertical cam-grooves the boundary walls or rims of which are inclined, whereby said walls or rims effect a vertical and radial movement of the locking-arms, substantially as specified.

3. In combination with a cam having vertical cam-grooves a wall of each of which is inclined, as described, a radial locking-arm the inner end of which is constructed to pass through the vertical cam-grooves, and to embrace or partly inclose the inclined wall of said groove, substantially as specified.

4. In combination with a compound cam, a radial locking-arm having an inner end constructed to project into a cam-groove, and to embrace or partly embrace a wall of said groove, a cover constructed to form a fulcrum, and a head-ring provided with ears, substantially as shown and described.

5. The combination, with a head-ring having a series of closed ears, of a cover provided with locking-arms, and a compound cam constructed and operating, as described, to reciprocate the outer end of the locking-arms into and upwardly against the openings in said ears, substantially as specified.

6. The combination of the head-ring A, the cover B, provided with fulcrums *e'*, and base F, having lugs *f* and hub *f'*, compound cam E, having the cam-grooves *e*, bounded by an inclined rim, *e'*, of locking-arms G, having projections *g'*, and means for operating the cam, substantially as shown and described.

7. The combination of the base having the hub *f'*, cover B, the cam E, handle H, bolt *G'*, and washers *f''*, and head-ring A, having ears *a* and locking-arms G, substantially as and for the purpose set forth.

8. In combination with a compound cam, a radial locking-arm having an inner end constructed to project into a cam-groove, and to embrace or partly embrace an inclined wall of said groove, a cover constructed to form a fulcrum, and a head-ring provided with ears, substantially as specified.

9. The combination of the cam E, the arm G, the base F, the washers *f''*, handle H, and nut *h*, substantially as and for the purpose specified.

10. The combination of the base-plate F, having the lugs *f*, the locking-arms G, having the portions *g'* adapted to pass between said lugs, and the portions *g'' g'''* at its inner end, with a cam having vertical slots or grooves the outer walls or rims of which are inclined, substantially as shown and described.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN G. PRITCHARD.

Witnesses:

E. CLARK,
MARION P. CLARK.