

No. 749,882.

PATENTED JAN. 19, 1904.

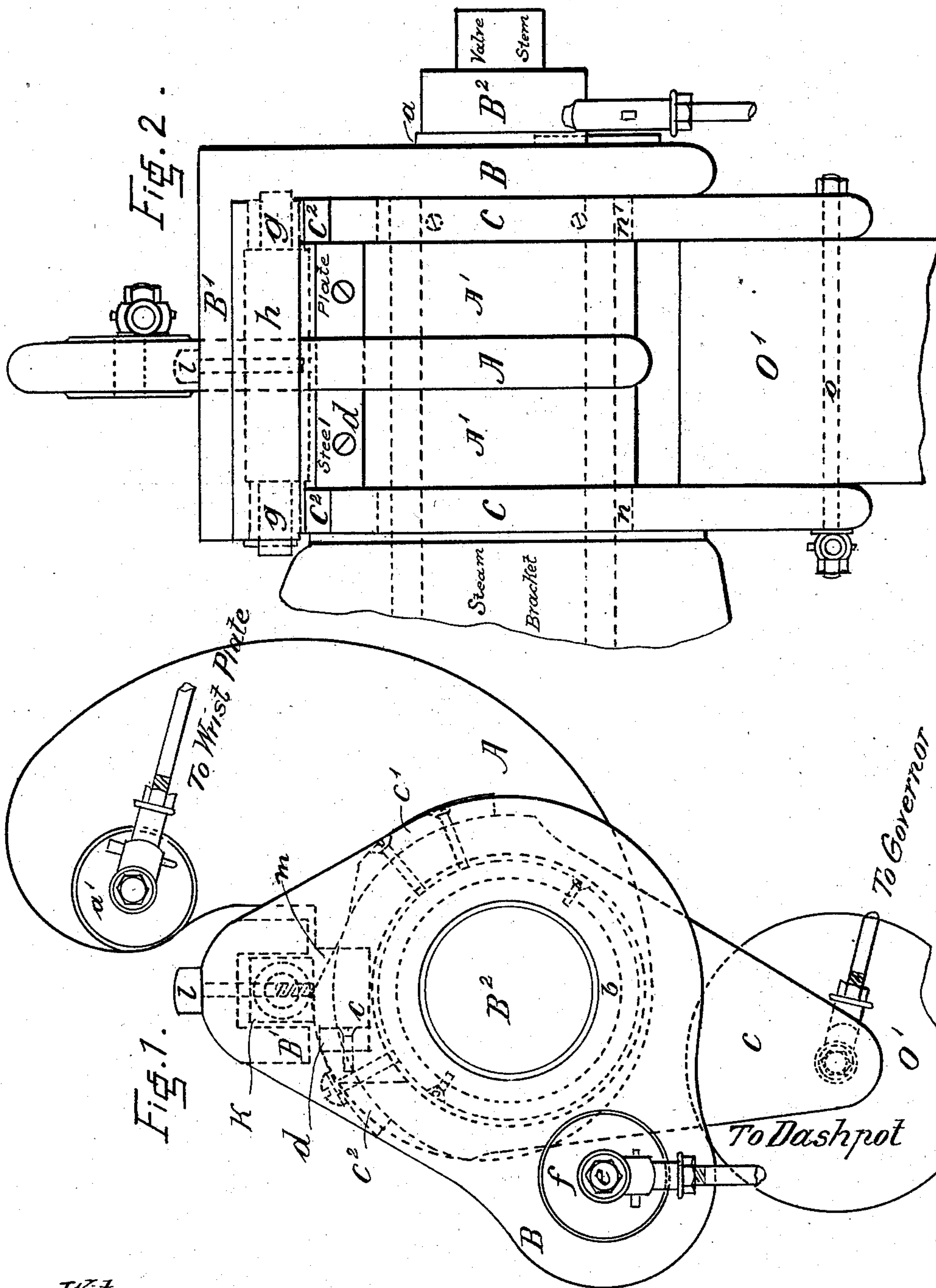
C. H. ROBINSON.

RELEASING VALVE GEAR FOR CORLISS ENGINES.

APPLICATION FILED JULY 14, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



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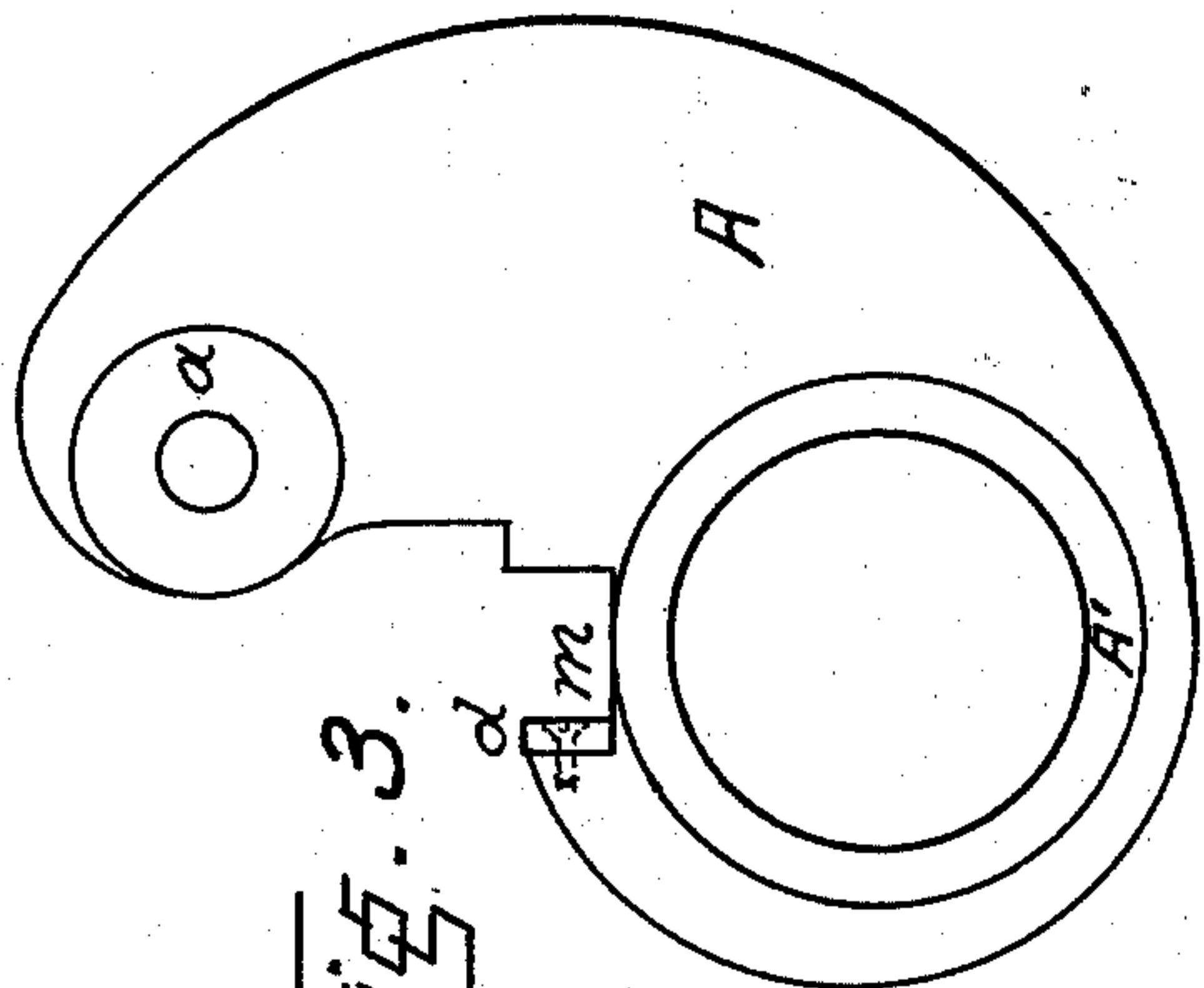


FIG. 3.

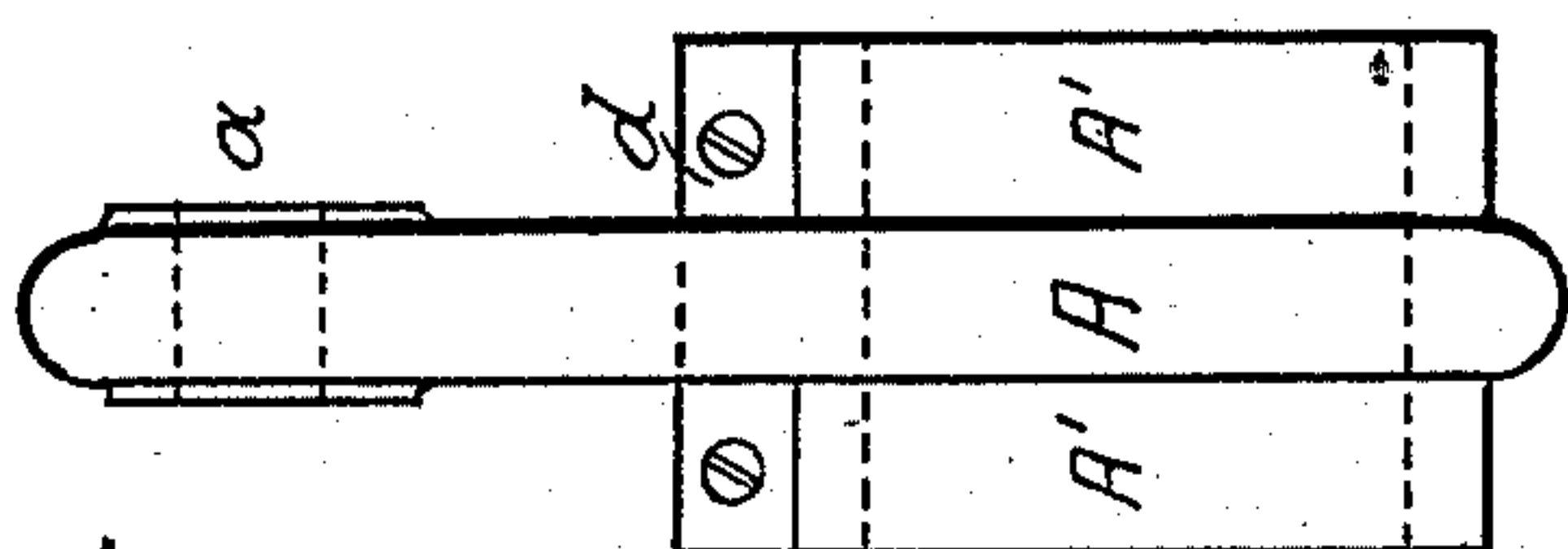


FIG. 5.

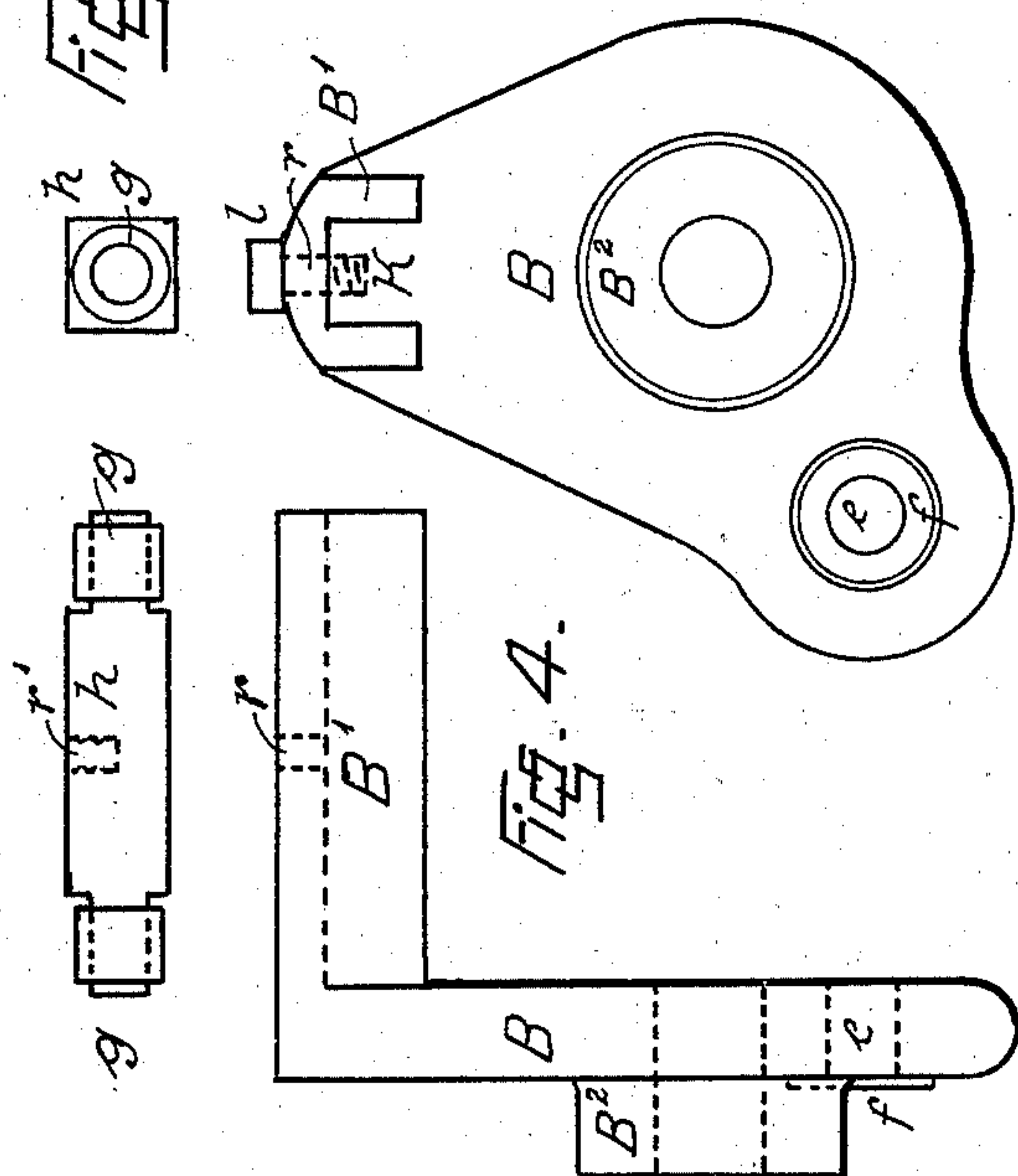


FIG. 4.

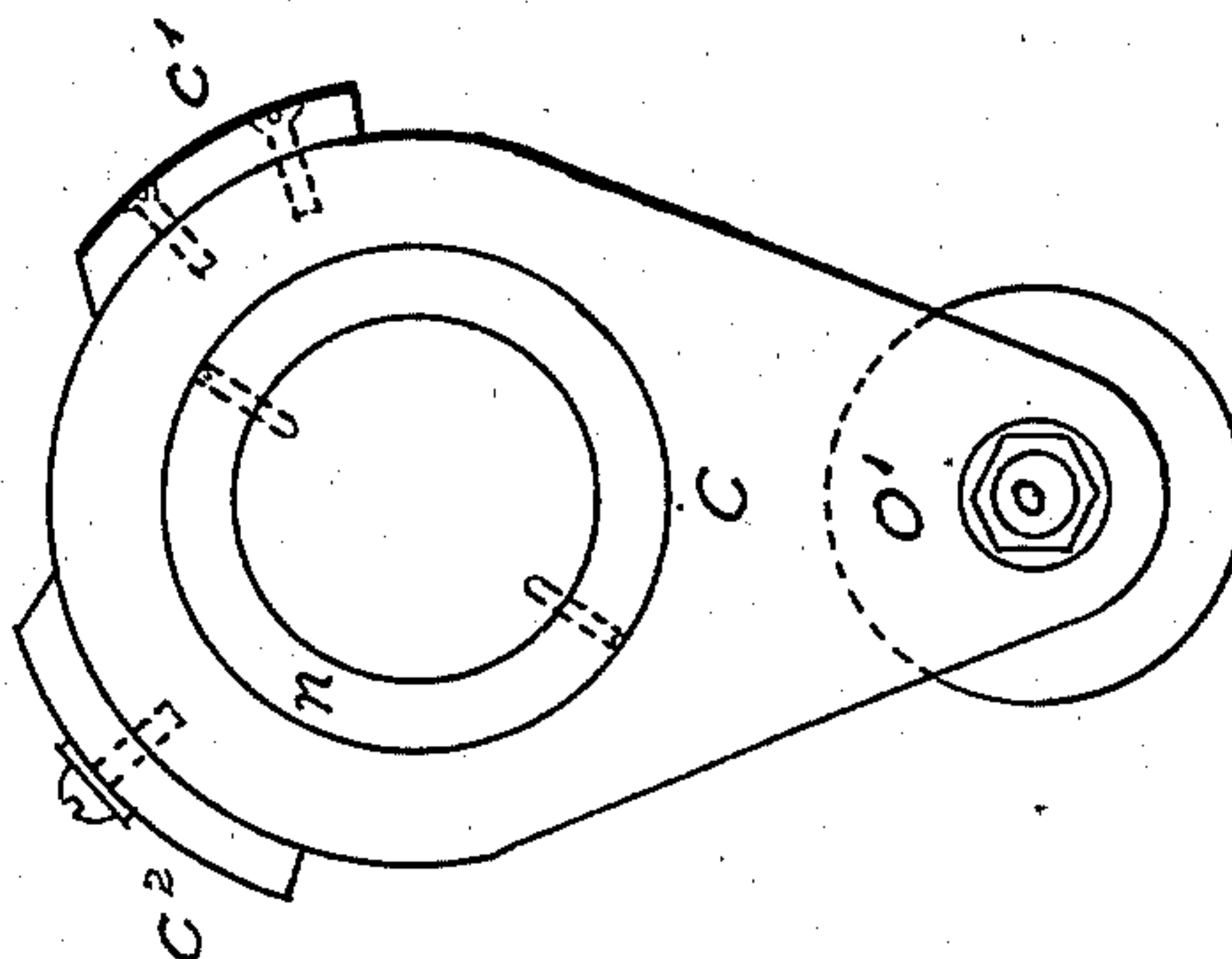
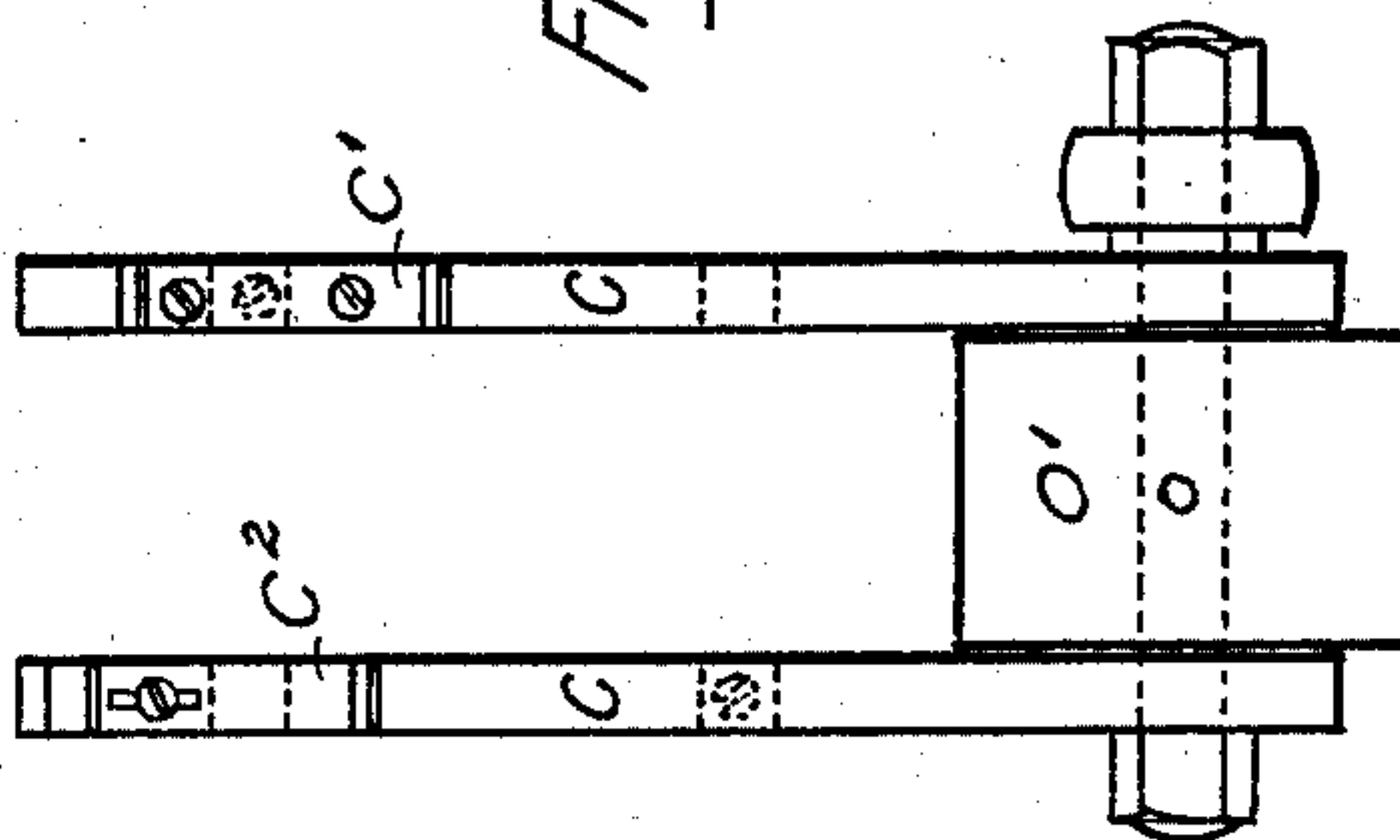


FIG. 6.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

CHARLES H. ROBINSON, OF HUNTSVILLE, TEXAS.

## RELEASING VALVE-GEAR FOR CORLISS ENGINES.

SPECIFICATION forming part of Letters Patent No. 749,882, dated January 19, 1904.

Application filed July 14, 1903. Serial No. 165,494. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES H. ROBINSON, a citizen of the United States, residing in the city of Huntsville, county of Walker, State of Texas, have invented a certain new Improvement in Releasing Valve-Gears for Corliss Engines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use same.

My invention relates to all kinds of steam-engines of the Corliss type.

My object is to provide an improved, simple, and convenient, as well as durable, device of this class.

To this end the novelty consists in the construction, combination, and arrangement of the same, as will be hereinafter more fully described, and particularly pointed out in the claims and accompanying drawings.

In the accompanying drawings the same reference characters indicate the same parts of the invention in all views.

Figure 1 represents a front elevation of the arrangement. Fig. 2 represents a side view of the arrangement. In said figures, A represents the loose arm, B represents the stiff arm, and C represents the trip-arms. On Sheet 2, Figs. 3, 4, 5, and 6 show the detached parts of the arrangement in detail front and side views, Fig. 3 representing the loose arm A, the side hubs A', the bosses *a*, the steel plate *d*, and the aperture *m*, Fig. 4 representing the stiff arm B, with its slotted arm B', the slot *h*, the hole *r*, the cap-screw *l*, the hub B<sup>2</sup>, boss *f*, and the bore *e*, Fig. 5 representing the center block *h*, the rollers *g*, and the threaded hole *r'*, Fig. 6 representing the trip-arms C with the trip-steels C', the safety-toe C<sup>2</sup>, the retaining-collar *n*, the weight *o'*, and the securing-bolt *o*.

The loose arm A is a casting of an irregular oval form, consisting of the body or center hub A and the side hubs A'. Both the body A and side hubs A' are provided with centers, of which the center of said body A represents the center of steam-bracket of any kind of Corliss engine, and the upper center of said hub A' represents the center of the pin of swing-

plate rod, (the swing-plate on any kind of Corliss engine standing on the point "Extreme throws," "Push.") These centers are provided on both sides with bosses *a* and *a'* in any suitable dimensions.

On point *c* of the body A said body A is provided with an attached hardened-steel plate *d*. This steel plate *d* is fastened to said body A in any suitable way and manner and is designed with the purpose of withstanding the wear and tear of the body A on this special point. This steel plate *d* extends to the entire depth of the body A. The loose arm is on point *m* provided with an aperture. Said aperture extends through the entire depth of said loose arm and is of such dimensions as to receive the center block *h* during the process of "hooking on."

The stiff arm B is a casting of irregular form in shape, and consists of a body B, slotted arm B'. To the upper part of body B the arm B' is attached in such a manner as to form a right angle to the body B and is of such a length as to cover both the loose arm A and the trip-arms C. The slotted arm B' is rounded on the top, with the exception of a flat space in the center for the purpose of allowing the horizontal striking of cap-screw *l*. On the outside of the body B is the hub B<sup>2</sup> located, corresponding with its center to the center of the steam-bracket on any kind of Corliss engine. This center is provided with a bore of sufficient dimensions to receive the valve-stem of any kind of Corliss engine. The stiff arm B is further provided on its lower part with the bore *e*, which bore has the function to receive the pin for the dash-pot rod. The point *e* on drawings represents the position "The dash-pot cut off" or "Clear down." The bore *e* is provided with a boss *f* on the outside only—that is, the side where the hub B<sup>2</sup> is attached. On the inside said bore *e* is flush with the body B.

The slotted arm B' consists of the arm, the roller *g*, and the center block *h*. The arm B' is slotted throughout its entire length, and this slot is of sufficient depth to receive the center block *h*, with the rollers *g* on its both ends, and is further provided on its top with a hole *r* of such dimensions to be able to let the cap-



screw  $l$  slip through easily. This cap-screw  $l$  regulates the vertical movement of said center block  $h$  in the space between the slot in arm  $B'$  of the stiff arm  $B$  and the aperture  $m$  and the loose arm  $A$ , accomplishing the purpose of engaging the stiff arm  $B$  by gravity instead of using springs. The rollers  $g$ —two of them, one on each end of center block  $h$ —are small concentric rollers provided with a bore through the center of same rollers for the purpose of receiving the axle of the center block  $h$ . The center block  $h$  is a steel block of sufficient dimensions to fill out with its square part that space of the arm-slot  $k$  in the arm  $B'$  lying between the two rollers  $g$ . Its shape is square, and both ends are turned centrally, so as to form axles for the purpose of receiving the roller  $g$  on the said axles. The axles have to be of such a diameter as to allow a free and easy movement of the rollers  $g$ . Said axles have to be of sufficient length above the end of the rollers to allow them to be secured against any displacement in an outward direction. This securing may be done in any way and manner suitable. The center block  $h$ , with the two rollers  $g$  and axles, comprising one part together, is embedded in the arm-slot in arm  $B'$  and is further provided with a cap-screw  $l$ , which cap-screw  $l$  fits loosely in the hole  $r$  on the top of slotted arm  $B'$ . This cap-screw  $l$  is threaded on the end and screwed with its thread to the center block  $h$  in the threaded hole  $r'$  to allow the rising-and-falling motion of the center block  $h$  in the open vertical distance between the arm-slot  $k$ , the center block  $h$ , and the aperture in the loose arm  $A$ , which movement engages the stiff arm  $B$  by gravity instead of using springs for the same purpose.

The trip-arms  $C$  are castings, partly concentric and partly of elliptic construction. One of these trip-arms  $C$  is placed between the steam-bracket end and the hub  $A'$  of loose arm  $A$ , and the other of these trip-arms  $C$  is placed in the space left open between the other side of the hub  $A'$  of loose arm  $A$  and of the stiff arm  $B$ . These trip-arms consist of the body  $C$ , the trip-steels  $c'$ , and the safety-toes  $c^2$ . The trip-arms  $C$  are bored out centrally to their horizontal axis, so as to fit with its bores on the retaining-collars  $n$  and  $n'$ . The retaining-collar  $n$ , located ahead of the loose arm  $A$ , is cast on the steam-bracket and forms thereof a part of the steam-bracket of any kind of Corliss engine. The retaining-collar  $n'$  is removable and placed between the loose arm  $A$  and the stiff arm  $B$ . This removable retaining-collar  $n'$  is secured in any suitable manner. These retaining-collars  $n$  and  $n'$  have the function to take up the lateral motion of the loose arm  $A$ . On their lower elliptical ends the trip-arms  $C$  are provided with the bore for the purpose of receiving the securing-bolt  $o$ . This bolt is threaded on both ends and is of sufficient length to reach through

both trip-arms  $C$  and to form on its steam-bracket end the pin for the side rod of the governor. On the upper concentric part of said trip-arm  $C$  is on one side located the trip-steel  $c'$  and on the other side the safety-toe  $c^2$ . The trip-steel  $C'$ , having the same circle inside as the trip-arm  $C$  outside, fits naturally with its inside concentric part close to the outside concentric part of the trip-arm  $C$ . On its highest circular point this trip-steel is cut down in such a manner as to engage the roller  $g$  to follow the inclined cut of trip-steel  $C'$  in upward direction, consequently releasing the valve. The trip-steel  $C'$  is fastened stationary in any suitable way to the trip-arm  $C$ .

The safety-toe  $C^2$  is located in the upper part of the trip-arm  $C$ , opposite trip-steel  $C'$ . Having the same circle inside as the trip-arm  $C$  outside, fits naturally close with its inner circle to the outer circle of the trip-arm  $C$ , cut down at its highest circular point in the same way and manner as the trip-steel  $C'$ . This safety-toe is slotted vertically in such a manner as to allow to operate a screw in said slot. With this screw movable along the slot the safety-toe is fastened to the trip-arm. Both the trip-steel and safety-toe are made of hardened steel to stand the wear and tear and may be constructed of any suitable dimensions. Between the two trip-arms  $C$  on their lower end around the bolt  $o$  is placed a weight  $o'$ . This weight  $o'$  is a casting of any suitable form filling out completely the space between the two trip-arms  $C$ , has the purpose of absorbing the blow caused by releasing valve, and to relieve the governor of the sudden shock enacted through the process of releasing valve.

Although I have specially described my invention with regard to the construction and relative arrangement of the several elements, I do not desire to be confined to same, as such changes or modifications may be made as clearly fall within the scope of my invention without departing from the spirit thereof.

Having thus fully described my invention, what I claim as my invention, and desire to secure by Letters Patent, is—

1. An improvement in releasing valve-gears for steam-engines of the Corliss type, a combination, with a suitable steam-bracket, consisting of a loose arm, having a center hub, two side hubs or bosses, bored out centrally to the horizontal axis, means to receive any suitable steam-bracket and valve-stem, a bore in the upper part of said center hub, means to receive a wrist-plate pin, an aperture running through the depth of said loose arm, a steel plate attached on one side of said aperture; a stiff arm, having an outer hub, bored out centrally to the horizontal axis, means to receive a valve-stem, a slotted arm, with a hole centrally located in the top part of said arm, extending rectangularly, a square center block, turned on both ends, forming axles,



said axles to receive two steel rollers, a threaded hole in top part of said center block, corresponding with the centrally-located hole in the top part of the slotted arm; a cap-screw; the center block and the rollers, constituting one part, are embedded in the slot of said slotted arm, and fitting loosely in said slot, therefore enabling through an easy vertical motion to operate the releasing-gear by gravity; a bore in the lower end of the said stiff arm, means to receive a pin for the dash-pot rod, substantially as described.

2. An improvement in releasing valve-gears for steam-engines of the Corliss type, a combination, with a suitable steam-bracket, consisting of a loose arm having a center hub, two side hubs or bosses bored out centrally to the horizontal axis, a bore in the upper part of the center hub, an aperture, running to the depth of the said loose arm, means to arrest the center block, in its gravitating motion in the space between the arm-slot of the stiff arm and the aperture of the said loose arm, a steel plate attached on one side of said aperture; a stiff arm, having an outer hub bored out centrally to the horizontal axis, a slotted arm, with a hole centrally located in the top part of said arm, extending rectangularly, a square

center block, turned on both ends forming axles, said axles, receive two steel rollers, a threaded hole in the top part of said center block, corresponding with the centrally-located hole in the top part of the slotted arm, to receive a cap-screw, a bore in the lower end of the stiff arm; a right and left trip-arm, bored out centrally to the horizontal axis, means to receive the retaining-collars in addition to any suitable steam-bracket and valve-stem; both trip-arms having stationary trip-steels, movable safety-toes, placed on the upper concentric part of said trip-arms; a weight; a connecting-bolt, threaded on both ends; a bore in the lower part of said trip-arms, means to receive said connecting-bolt with said weight, which latter is placed between the right and left trip-steel; the connecting-bolt forming at the same time on one of its threaded ends a pin for the governor side rod, substantially as described before.

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

CHARLES H. ROBINSON.

Witnesses:

J. K. ELKINS,  
A. E. KING.