

(No Model.)

4 Sheets—Sheet 1.

O. F. LEIBERT.
CLUTCH.

No. 506,517.

Patented Oct. 10, 1893.

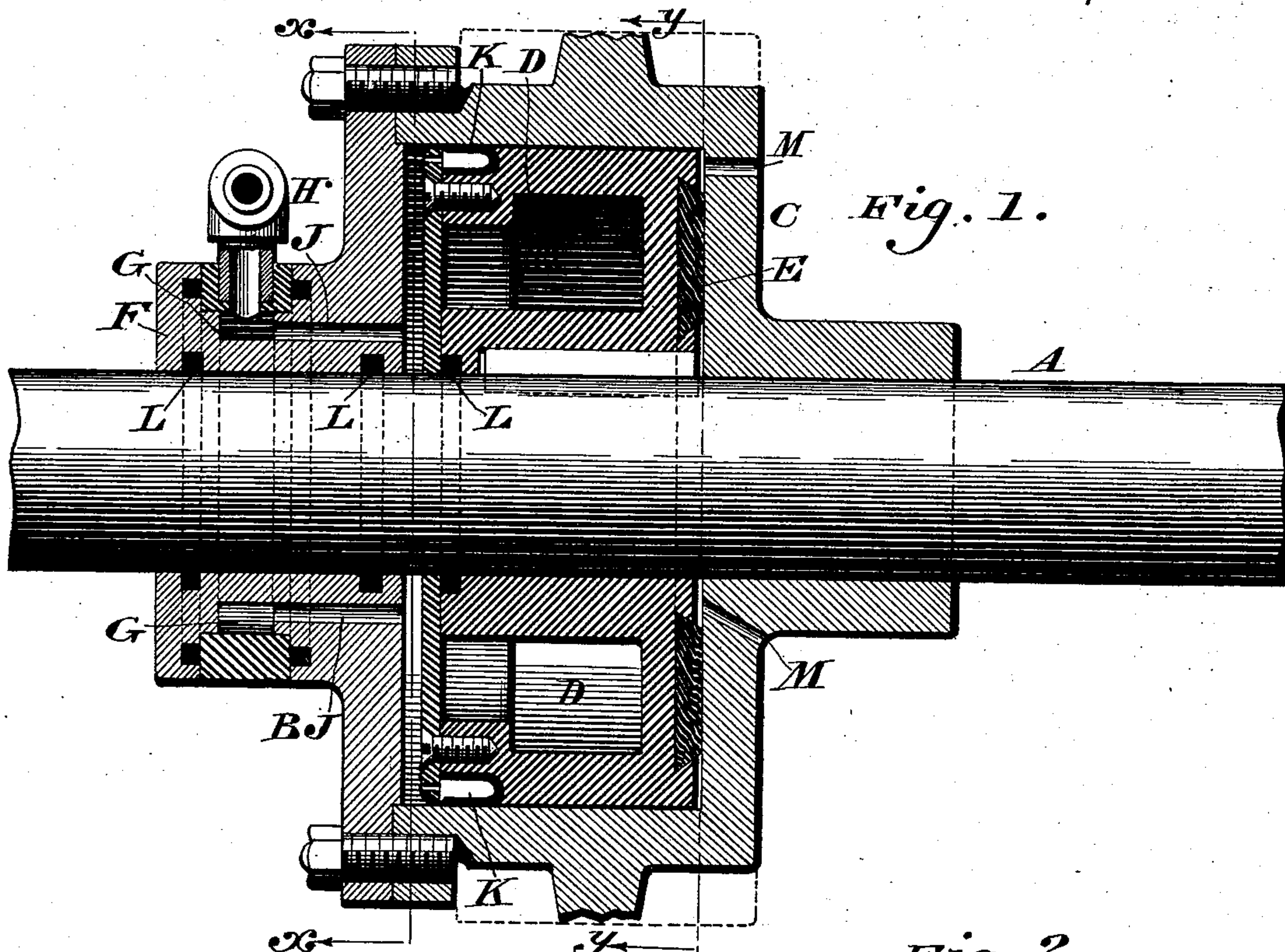
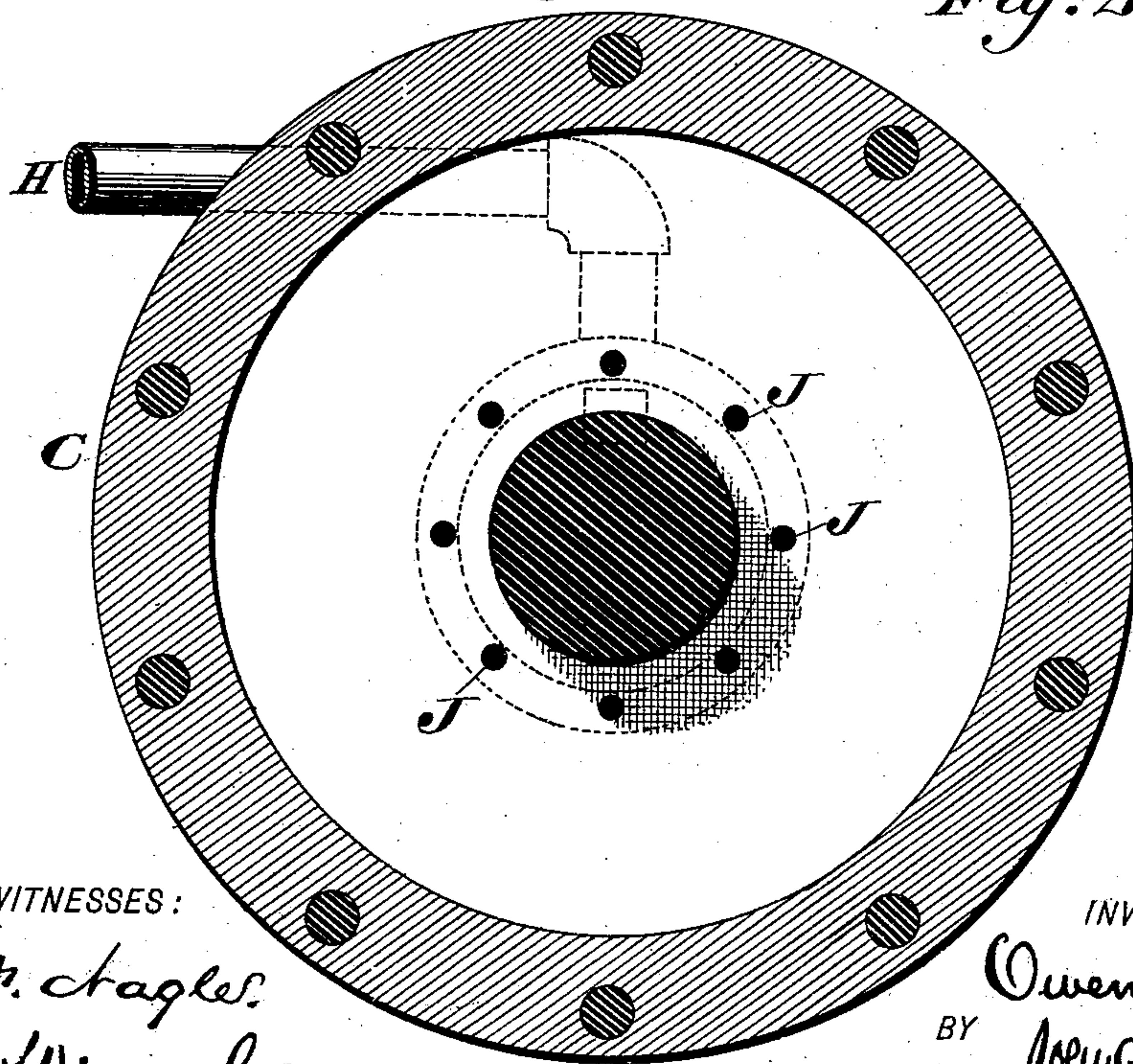


Fig. 2.



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(No Model.)

4 Sheets—Sheet 2.

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Fig. 3.

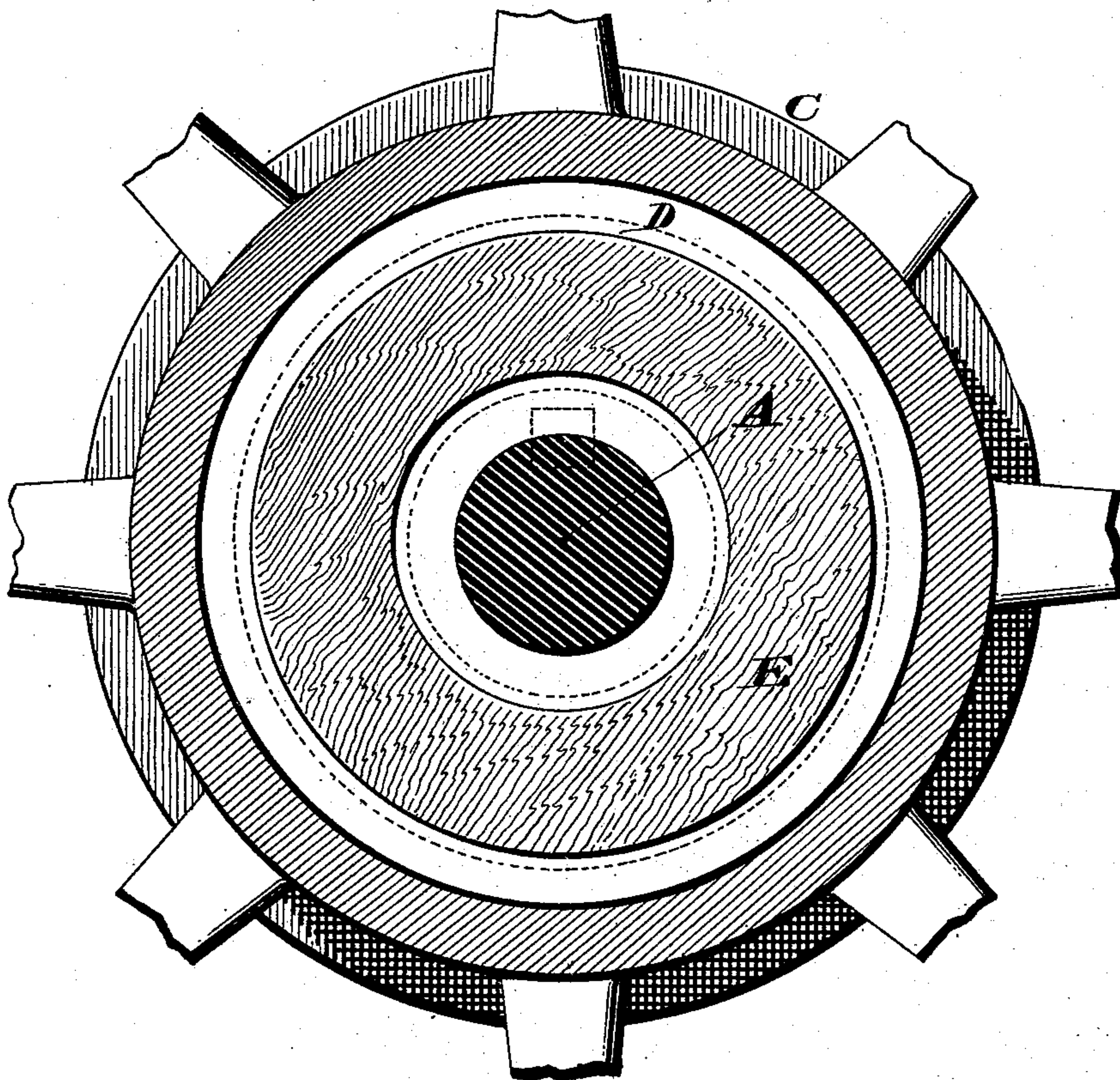
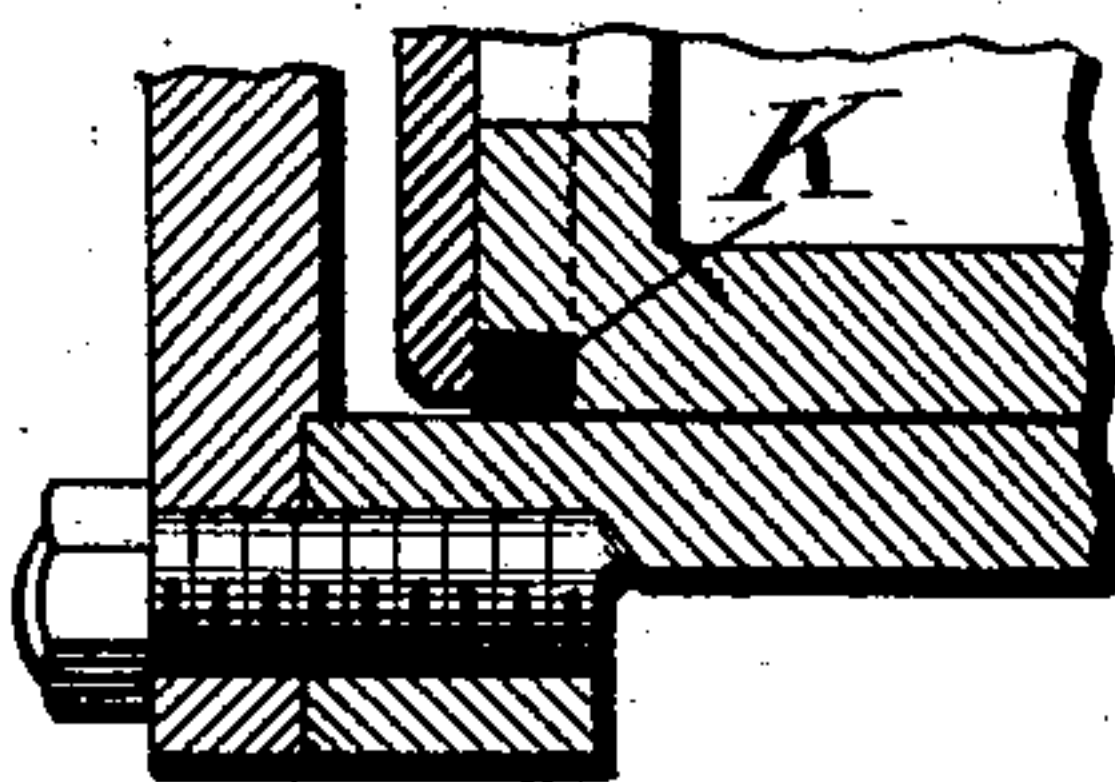


Fig. 4.



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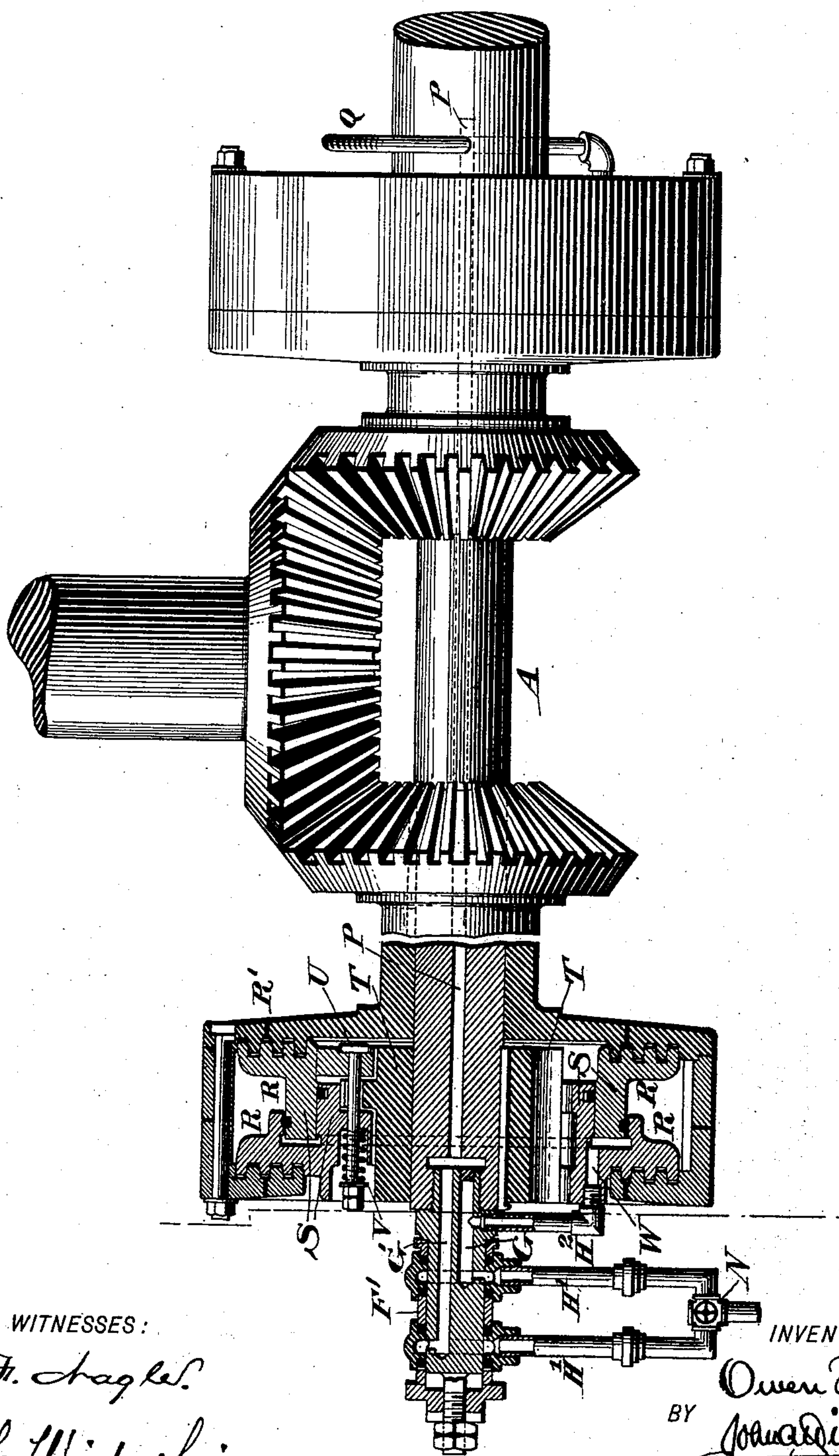
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Fig. 5.



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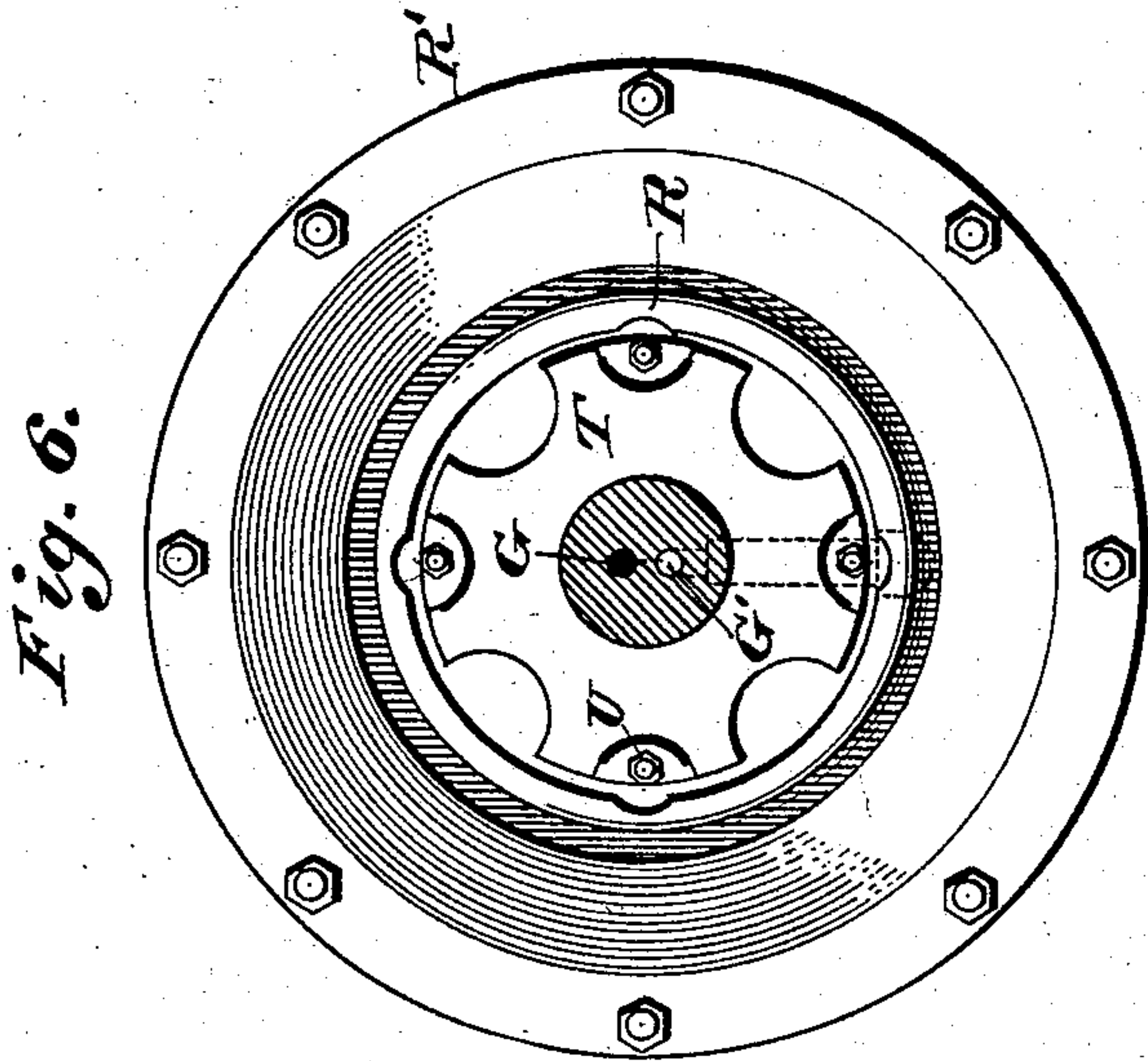


Fig. 7.

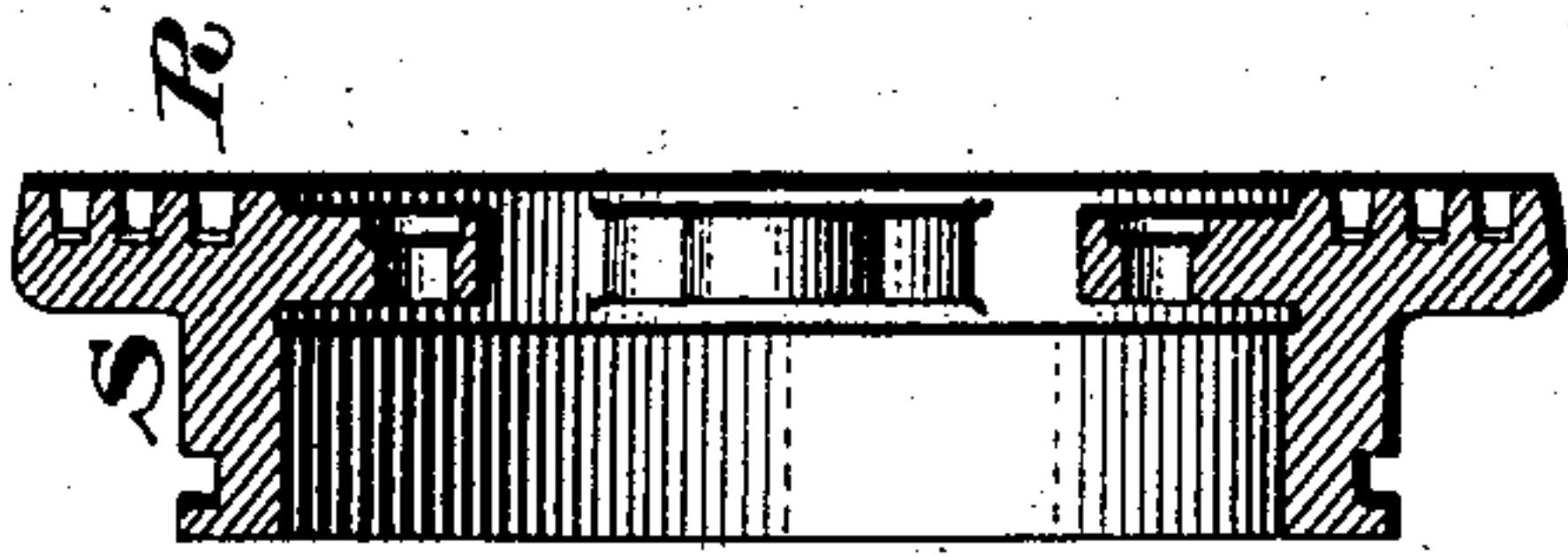


Fig. 8.

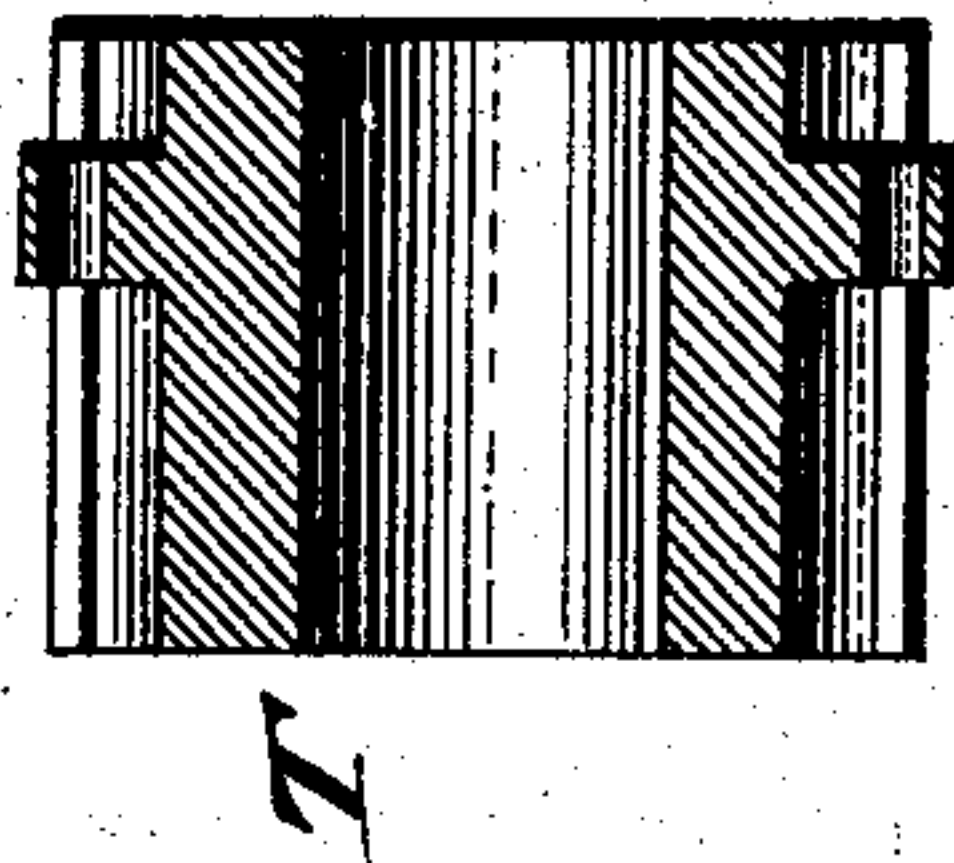


Fig. 9.

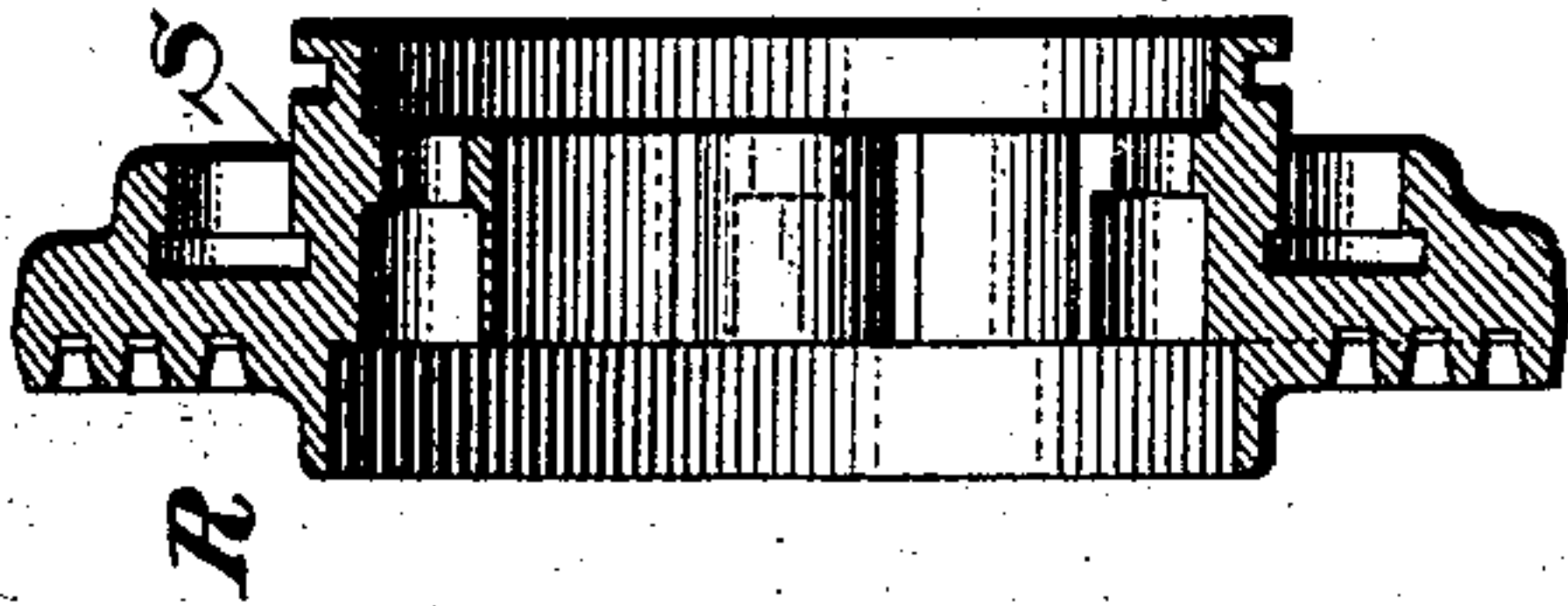


Fig. 11.

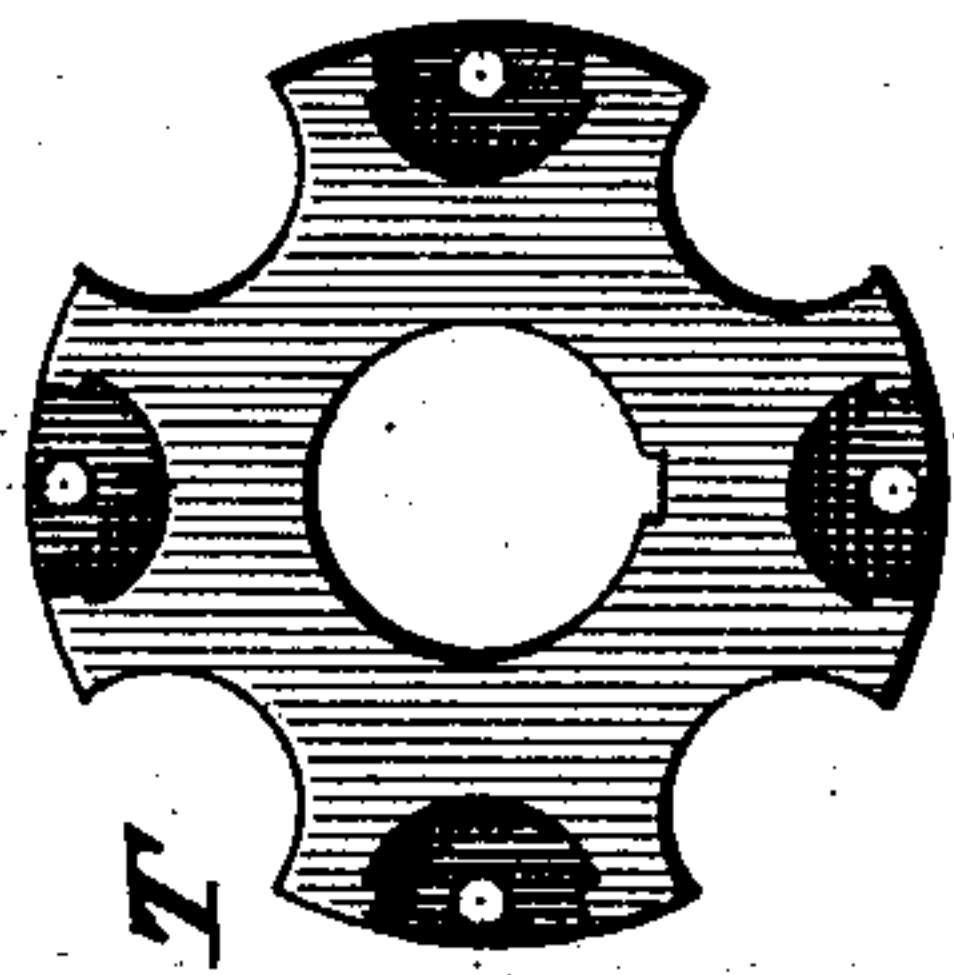
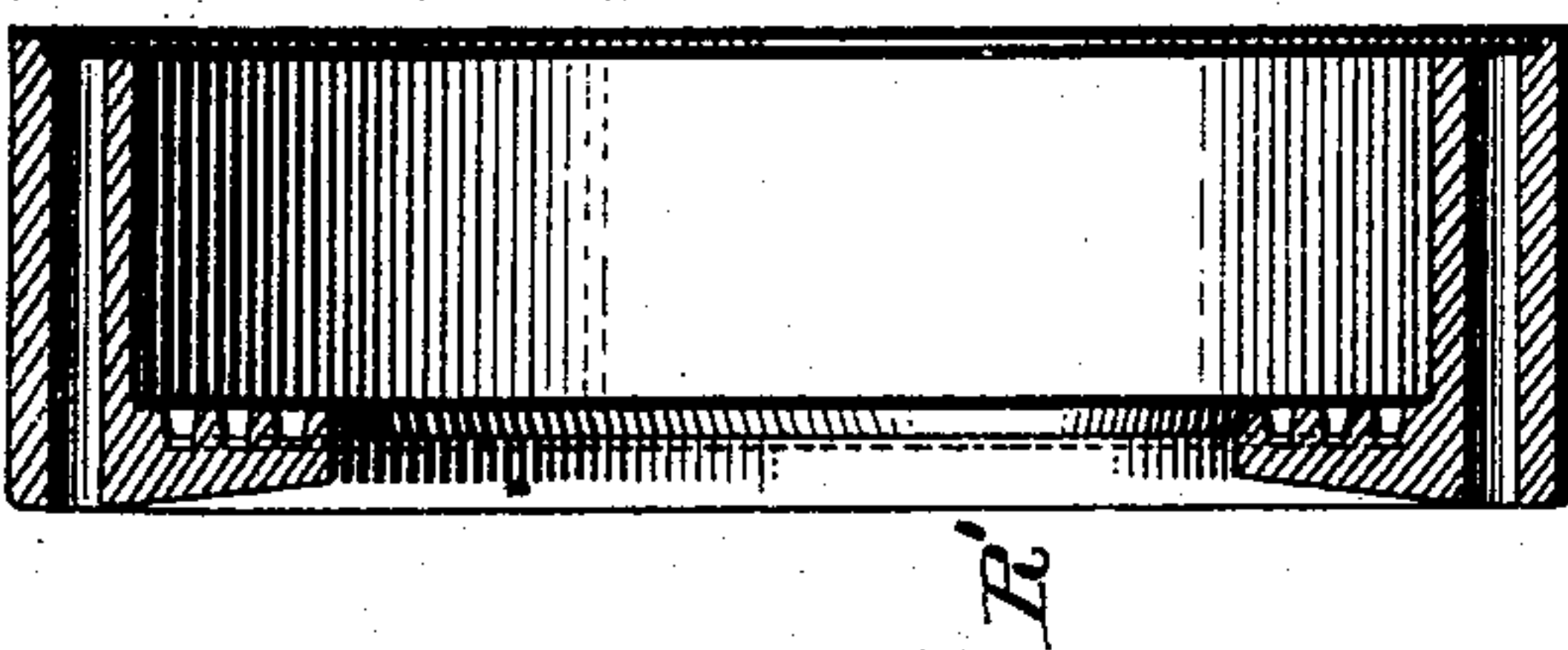


Fig. 10.



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UNITED STATES PATENT OFFICE.

OWEN F. LEIBERT, OF BETHLEHEM, PENNSYLVANIA.

CLUTCH.

SPECIFICATION forming part of Letters Patent No. 506,517, dated October 10, 1893.

Application filed November 19, 1891. Serial No. 412,377. (No model.)

To all whom it may concern:

Be it known that I, OWEN F. LEIBERT, a citizen of the United States, residing at Bethlehem, in the county of Northampton, State of Pennsylvania, have invented a new and useful Improvement in Friction-Clutches, which improvement is fully set forth in the following specification and accompanying drawings.

My invention consists of a friction clutch in which the movable member thereof is operated by pneumatic action, or in lieu thereof that of steam, gas, or other fluid under pressure, the construction of parts being herein-after fully set forth and definitely pointed out in the claims that follow the specification.

Figure 1 represents a longitudinal section of a clutch embodying my invention. Fig. 2 represents a section on line *x, x*, Fig. 1. Fig. 3 represents a section on line *y, y*, Fig. 1. Fig. 4 represents a section of a portion showing a modification of the packing employed between the movable and fixed members of a clutch. Fig. 5 represents a partial longitudinal section and partial side elevation, showing a system of operating two or more clutches, by pneumatic action, or in lieu thereof that of steam, gas, &c. Figs. 6 to 11, inclusive, are detail views of the members of one of the clutches shown in Fig. 5.

Similar letters of reference indicate corresponding parts in the several figures.

Referring to the drawings: A, Figs. 1, 2, and 3, designates a shaft on which the clutch B is mounted, the member or part C of said clutch being loose on the shaft, and the member or part D keyed or otherwise secured thereto, so as to slide longitudinally thereon, it being noticed that the part C incloses the part D, and one side of the latter has a facing E inserted in a groove or recess therein, and projecting beyond the said side, and which is adapted to contact with the adjacent side of the former.

F designates a collar which is freely mounted on the shaft A and connected with the part C on the side opposite to that with which the facing E contacts, and provided with a chamber G, into which leads the pipe H, the latter being connected with a supply of air, &c., under pressure, or if desired, with a supply of steam, gas, &c. In the hub of the part C of the clutch, are ports J, which are in com-

munication with the chamber G and the interior of the part C of the clutch on the side of the part D, opposite to the facing E.

The rim or periphery of the part D of the clutch on the side toward the ports J is grooved to receive packing K, see Fig. 1, which packing when subjected to the pressure of air, &c., is expanded against the inner face of the periphery of the part C of the clutch, thus forming an air-tight joint between the parts at the place of location of said packing. Packing L is secured to the inner walls of the parts C and D, and collar F, the same being in contact with the shaft A, so as to form air-tight joints thereat.

Fig. 4 shows a form of packing substituted for that shown in Fig. 1.

The operation is as follows: The part D of the clutch, being splined to the shaft, rotates when the same revolves, while the part C being loose thereon, remains stationary. When however it is desired to clutch said part C, and communicate power thereto, air, &c., is admitted into the chamber G of the collar F, and directed from the same through the ports J into the part C of the clutch and impacted against the side of the part D, whereby the latter is forced against the side of the part C, and firmly held engaged therewith, thus causing rotation of the part C. When the pressure is released, the holding or clutching action of the part D is relieved, and thus the part C is again at rest.

In order to permit the escape of any air that may improperly enter the part C between the same and the side of the part D, having the facing E thereon, ports or vents M are formed in the proper wall of the part C, the same opening into the atmosphere.

Where two or more clutches are employed, and they are mounted on the same shaft or a continuation of the same, as in Fig. 5, the collar F' is provided with a chamber G' in addition to the chamber G, said chambers G, G', being respectively in communication with pipes H leading from the source of supply of air, &c., under pressure. The connection of the pipes H, H', is provided with a four-way cock N, whereby air, &c., may be admitted to both pipes, to either pipe, or entirely cut off from the same.

In the shaft A is a bore or port P, which is

in communication with the chamber G' and extends to the next clutch, where it communicates with a pipe Q, leading into said clutch, so that the two clutches may be simultaneously or separately operated.

In Figs. 5 to 11 inclusive, there is shown the fixed part of the clutch as formed of two sections or members R, R, the inner faces of which have circular tongues S, which freely overlap each other, and said members encircle a collar T on the shaft A. Through openings in said member and collar are passed the bolts U, which freely connect said parts. Springs V are interposed between the nuts of the bolts and one of the members for restoring the members to their normal position for opening or releasing the clutch.

The collar F has connected with it the pipe H², the same leading from the chamber G to the chamber W within the clutch, whereby the air or other fluid employed, enters between the members R, R, and forces them in opposite direction against the stationary member R' of the clutch.

The number of ports in the shaft may be multiplied relatively to the number of clutches it is intended to employ on the shaft A.

It will be seen that the clutch presented in either case is simple and effective, and may be quickly and easily operated, without thrust on the shaft or any portion thereof, and comparatively without noise.

I am aware that it is not new to construct a pneumatic friction clutch, wherein a shaft having a loose and a fast wheel thereon is provided with a passage opening into the space between the said wheels, whereby a blast of air may force the said wheels into engagement, and such I do not claim; but I am not aware that it is old to wholly inclose the fast wheel within the loose member; neither am I aware that it is old to provide a detachable engaging surface or ring for one of the clutch members, or that it is old to provide the movable member of the clutch with openings or passages for the transmission of the compressed air.

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

1. A clutch having a loose and a movable member, said loose member inclosing said movable member, and forming a fluid cham-

ber in which said movable member is adapted to slide longitudinally on the supporting shaft, and a collar loose on said shaft having a chamber in communication with a supply pipe in the hub of the loose member, and having a port communicating with the said fluid chamber of the inclosing loose member, said parts being combined substantially as described.

2. The combination of a movable member, a loose member inclosing said movable member, and forming a fluid chamber in which said movable member is adapted to slide, a collar loose on the supporting shaft of the latter having a bore therein, and adapted to carry a plurality of clutches, two chambers in said collar, two pipes with which said chambers are separately connected, and a pipe leading from one of the air chambers of the collar to the air chamber of the loose member of the clutch, said parts being combined substantially as described.

3. The loose and movable members of a clutch, the loose member having therein a fluid chamber in which the movable member is adapted to slide longitudinally, a loose collar on the supporting shaft having two chambers, supply pipes communicating with said chambers respectively, and a pipe communicating with one of the chambers of the collar and the air chamber of the loose member, said shaft having a bore in communication with one of the chambers of the collar, and said supply pipes having a cock between them, said parts being combined substantially as described.

4. The movable and loose members of a clutch, the loose member having a fluid chamber in which the movable member is adapted to slide longitudinally, packing on the periphery of the movable member adapted to be expanded against the inner wall of the loose member by the action of fluid admitted into said chamber, and a loose collar on the supporting shaft having a chamber and a supply pipe connected therewith, the hub of the loose member having a port communicating with the chamber of the collar and the chamber of the loose member, said parts being combined substantially as described.

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Witnesses:

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