

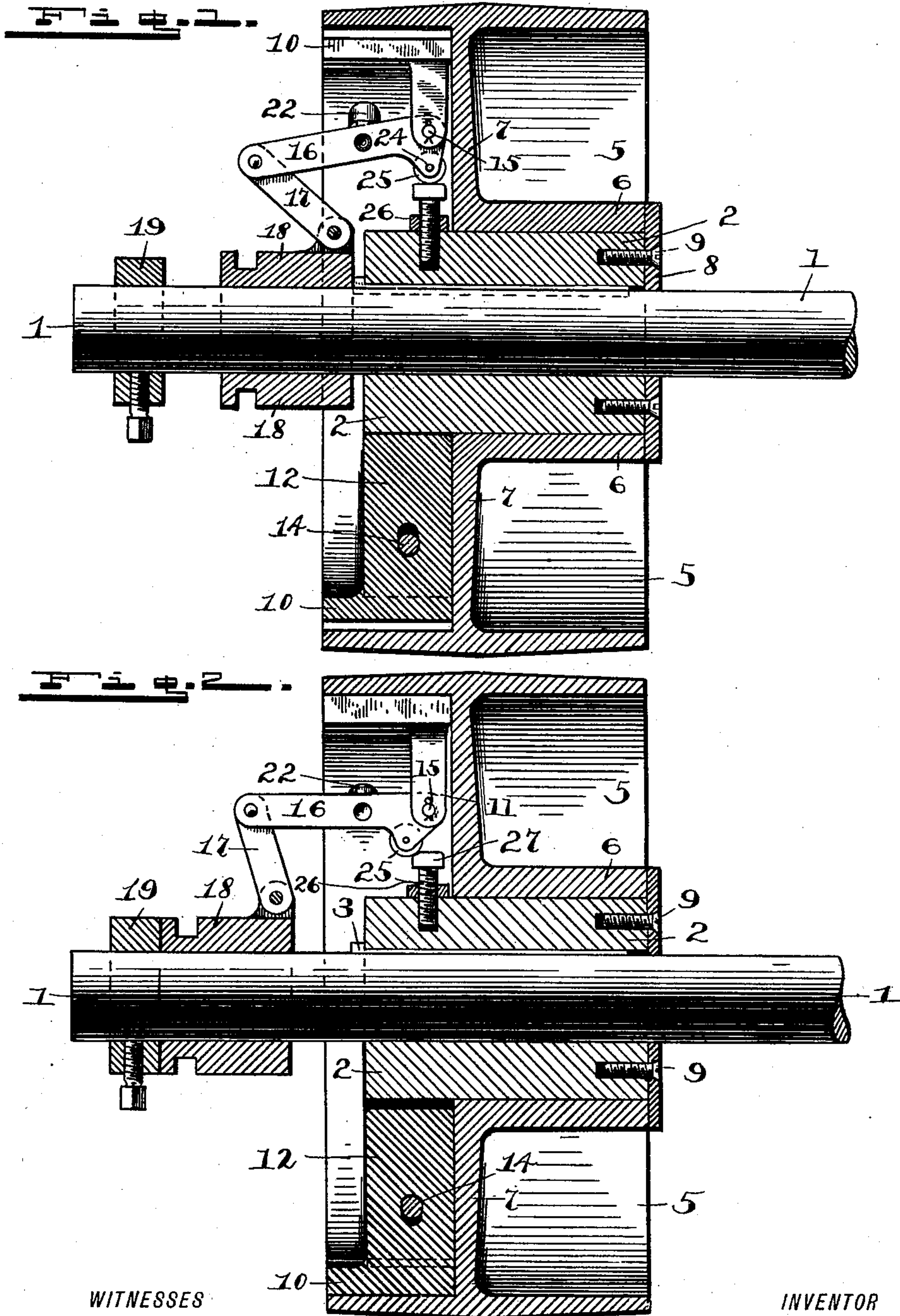
(No Model.)

2 Sheets—Sheet 1.

S. T. JOHNSON.
FRICTION CLUTCH.

No. 599,966.

Patented Mar. 1, 1898.



WITNESSES

F. W. Hoerner
Julia Green

INVENTOR

Seward T. Johnson
BY
V. H. Lockwood
His ATTORNEY.

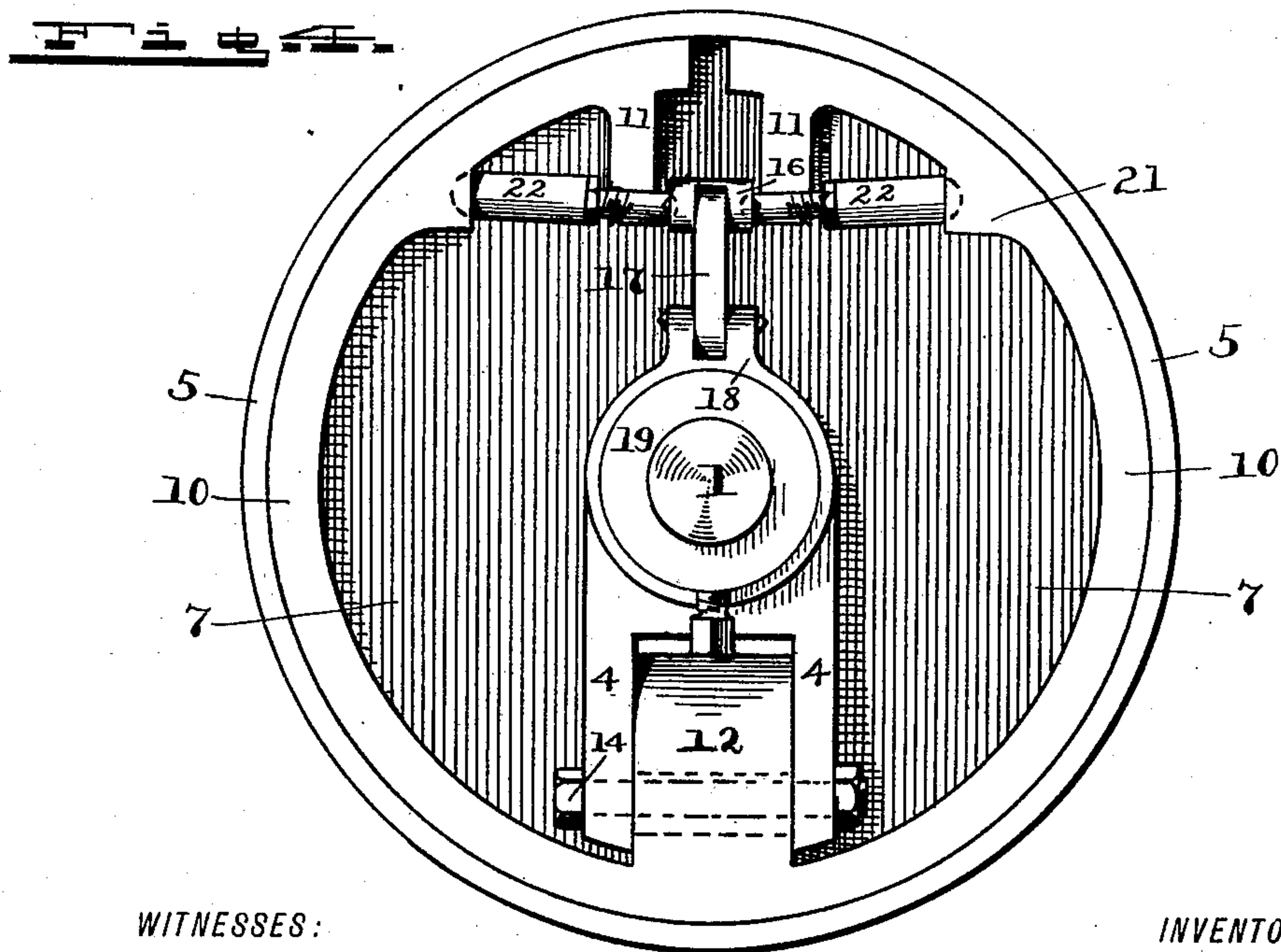
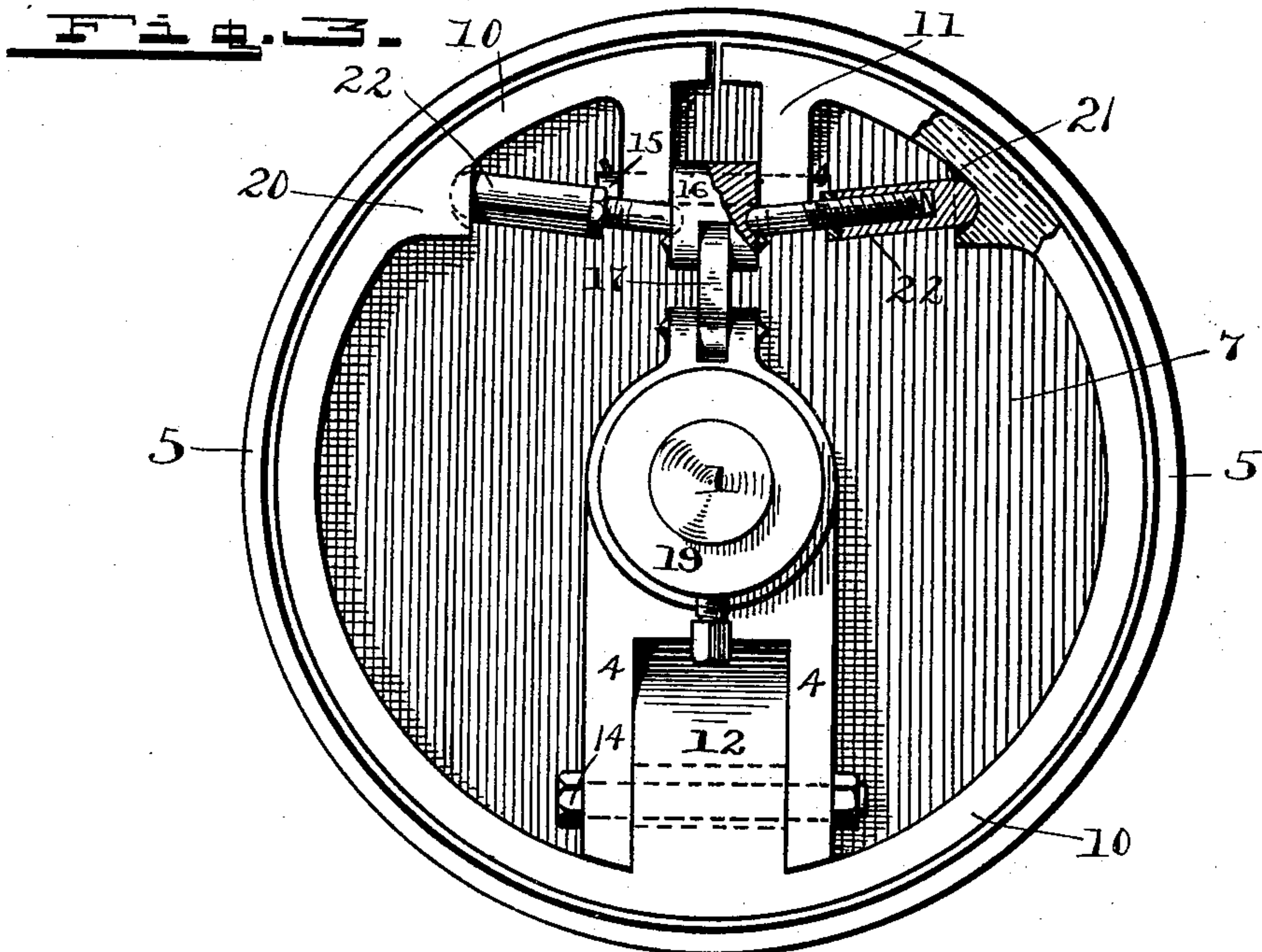
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UNITED STATES PATENT OFFICE.

SEWARD T. JOHNSON, OF NOBLESVILLE, INDIANA.

FRICITION-CLUTCH.

SPECIFICATION forming part of Letters Patent No. 599,966, dated March 1, 1898.

Application filed January 11, 1897. Serial No. 618,902. (No model.)

To all whom it may concern:

Be it known that I, SEWARD T. JOHNSON, of Noblesville, county of Hamilton, and State of Indiana, have invented a certain new and useful Friction-Clutch; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which like numerals refer to like parts.

My invention relates to a friction-clutch where the friction is applied to the internal surface of the pulley. The purpose of this invention is to make a strong construction adapted to occupy a small amount of space on the shaft, to be cheap and simple in its construction, easy and positive in its operation, and to expand the friction-ring so that it will be brought into contact with the pulley at all points simultaneously and equally and be disengaged at all points simultaneously and completely—that is, always be centered.

To this end one feature of my invention consists in pivoting the lever that actuates the toggles to an extension from the friction-ring instead of an arm from the stationary sleeve.

Another and the most important feature consists in means for accurately centering the friction-ring at all times, whereby it will simultaneously at all points engage and disengage the pulley.

The full nature of my invention will appear from the accompanying drawings and the description and claims following.

In the drawings, Figure 1 is a central cross-section of the pulley and clutch mounted on the shaft, partly broken away, the friction-ring being out of engagement with the pulley. Fig. 2 is the same with the friction-ring in engagement with the pulley. Fig. 3 is a side elevation of the same with the friction-ring out of engagement with the pulley, parts being cut away for illustration. Fig. 4 is the same with the ring in engagement with the pulley.

In detail, 1 is a shaft driven by any suitable means.

2 is a stationary sleeve held on the shaft by the spline 3 and having a pair of parallel arms 4 extending from it on one side, as seen in Figs. 3 and 4. The pulley 5 has its hub 6, that extends in only one direction from the central web 7, mounted on the stationary

sleeve 2, so as to rotate thereon. It is held on such sleeve at one side by the cap 8, that is secured by screws 9 to the sleeve 2. The pulley is held on the sleeve at the other side by the arms 4.

Within one side of the pulley I place a friction-ring 10, that is split at one place and is of such dimensions that when expanded slightly it will engage the inner surface of the pulley. Near the separated ends of this ring 10 I place a pair of inwardly-extending parallel arms 11, and at the opposite point I place a single inwardly-extending arm 12, whose width is such as to permit it to easily pass between the arms 4 of the stationary sleeve 2, so that it can freely move longitudinally. It is held in place by a bolt 13, which passes through the arms 4 and the elongated slot 14 in the arm 12. The relative lengths of the arms 4 and 12 and the arrangement of the slot 14 are such as to permit the inward and outward movement of the arm 12. In the arms 11 on the other side of the friction-ring I loosely mount a bolt 15, on which I pivot the end of the lever 16. At the other end of the lever 16 I pivot a link 17, that is connected with a sliding sleeve 18. This sliding sleeve is limited in its movements by the stationary sleeve 2 on one side and by a collar 19, that is fastened to the shaft on the other side.

I provide a pair of square-faced lugs 20 on the friction-ring, as seen in Figs. 3 and 4, and cut in such lugs a round socket or seat 21, as is illustrated in Fig. 3, for the rounded ends of the toggles 22. The inner ends of such toggles are similarly rounded and held in a similar seat on each side of the lever 16. From the construction thus far described it is apparent that when the outer end of the lever 16 is elevated, as seen in Figs. 2 and 4, the ring will be expanded by the toggles into close engagement with the pulley. When the outer end of the lever 16 is depressed, as seen in Figs. 1 and 3, the reverse condition of the ring will exist.

In order to withdraw the side of the friction-ring that is opposite the split away from the pulley when the ring is not expanded by the toggles, I provide the shifting wheel 25, which is carried in a pair of ears 24 on the inner side of the lever 16, near its inner end.

To engage this wheel, I secure a bolt 27 in the stationary sleeve 2. It is set in a properly-elevated position by the set-nut 26 and has a substantially flat head, upon which the wheel 25 rolls when the friction-ring is being disengaged from the pulley. In such case the outer end of the lever 16 is drawn down, as seen in Fig. 1, causing the wheel to rotate upon the head of the bolt 27 and also causing the push on the toggles to be relaxed. By this the split ends of the rings come together, as seen in Fig. 3, withdrawing the portions of the ring near the split away from the pulley. As these portions of the ring are being withdrawn from the pulley the opposite portions of the ring are likewise being withdrawn from the pulley by the wheel 25 riding upon the head of the screw 27 and thus pushing the whole ring somewhat over in the direction of the split. This last movement coöperates with the relaxation of the toggles in disengaging the ring from the pulley at all points at the same time and also to the same extent. In this shifting movement referred to the following parts coöperate: the arms 11, bolt 15, lever 16, wheel 25, bolt 27, arms 4 and 12, with its slot, and the bolt 13, together with the split ring. In effecting the uniform contraction and expansion of the entire ring the toggles coöperate with the parts just named. The shifting movement caused by the wheel 25 and lever 16 should be simultaneous with and equivalent to the relaxation of the toggles and contraction of the portions of the ring near the split. Since both of these influences are controlled by the action of the lever 16, it is seen that they will necessarily be simultaneous if the parts are properly adjusted. Therefore the ring will make an easy and uniform engagement with or disengagement from the pulley.

As the parts wear, the toggles may be lengthened and the bolt 27 screwed so as to extend a little farther out from the stationary sleeve. The limit of movement of the sliding sleeve 18 is such that it will hold the wheel 25 on the head of the bolt 27 while the ring is disengaged from the pulley. Furthermore, when the parts are in that position the bolt 15, the wheel 25, and the bolt 27 should be in line with each other. When the ring is expanded, the link 17 should be preferably perpendicular to the shaft on which the sliding sleeve 18 is mounted, so that such sleeve will not have a tendency to slip, although where the sleeve 18 has means for holding it properly in place these precautions are needless. The sleeve is slipped to and fro by such means as is well known in the art. Heretofore, so far as I am aware, the stationary sleeve has been mounted to one side of the pulley-hub and the pulley has been mounted directly on the shaft, whereby much more shaft room is required than with the construction I have shown. The split ring, it must be understood, is made with such tension that it will spring away from the pulley or contract when it is not being expanded by the toggles.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a friction-clutch, the combination with the pulley, of a split friction-ring adapted to engage the inner face of said pulley and having an arm extending inward from the end of the ring, a lever pivoted at one end to said arm, and toggles extending from opposite sides of said lever to the ring, whereby through the toggles said ring is expanded or contracted and the lever is supported by the ring, substantially as set forth.

2. In a friction-clutch, the combination with the pulley, of a split friction-ring adapted to engage the pulley when expanded, said ring having an inwardly-extending arm from each of its ends, a lever pivoted between such arms, toggles extending from opposite sides of said lever to the opposite ends of the ring and means for actuating the lever, substantially as set forth.

3. In a friction-clutch, the combination with a pulley, of a split friction-ring adapted when expanded to engage the inner face of the pulley and having an inward-extending arm at each split end, a stationary sleeve mounted on the shaft, a lever pivoted in the arms extending from the split ends of the ring with a bearing on said stationary sleeve, toggles extending from said lever on each side to the ring, and means for actuating said lever, whereby said lever will simultaneously expand the split ends of the ring and shift the entire ring toward the side where the split is located, substantially as set forth.

4. In a friction-clutch, the combination with the pulley, of a stationary sleeve mounted on the shaft, a split ring adapted when expanded to engage the inner face of the pulley and having an inward-extending arm at each split end, a lever pivoted to said arm, suitable toggles connecting said lever and the friction-ring, means for actuating said lever, whereby the ring on each side of the split will be expanded or contracted, a shifting wheel mounted in said lever near its inner end, and a bolt or extension from the stationary sleeve which said wheel mounts when the lever is moved to relax the toggles, whereby the ring is forced to disengage the pulley at all points.

5. In a friction-clutch, the combination with a pulley, of a stationary sleeve mounted on the shaft with a pair of parallel arms extending therefrom, a split friction-ring which when expanded will engage the inner face of the pulley and provided near the split with a pair of inwardly-extending arms and on the opposite side with an inwardly-extending arm that operates loosely between the arms from the stationary sleeve, a lever pivoted at one end to the arms extending from the ring near its split, toggles extending from said lever to the ring, means for actuating said lever, a wheel pivoted in the lever near its inner end, and an adjustable bolt secured in the stationary sleeve, substantially as set forth.

6. In a friction-clutch, the combination with

a pulley, of a stationary sleeve, a split ring
with inwardly-extending arms near the split,
a lever with one end mounted in said arms,
toggles extending from said lever to the ring
5 for expanding the same, a stationary collar
on the shaft, a sliding sleeve mounted on the
shaft that is limited in its outward movement
by said collar and in its inward movement by
the stationary sleeve, a link connecting the
10 said sleeve with the outer end of the lever, a
wheel mounted in the lever near its inner end,

and a bolt or extension from the stationary
sleeve on which such wheel rides when the
lever is moved and the toggles are relaxed,
substantially as and for the purpose set forth. 15

In witness whereof I have hereunto set my
hand this 9th day of December, 1896.

SEWARD T. JOHNSON.

Witnesses:

V. H. LOCKWOOD,
ZULA GREEN.