

(No Model.)

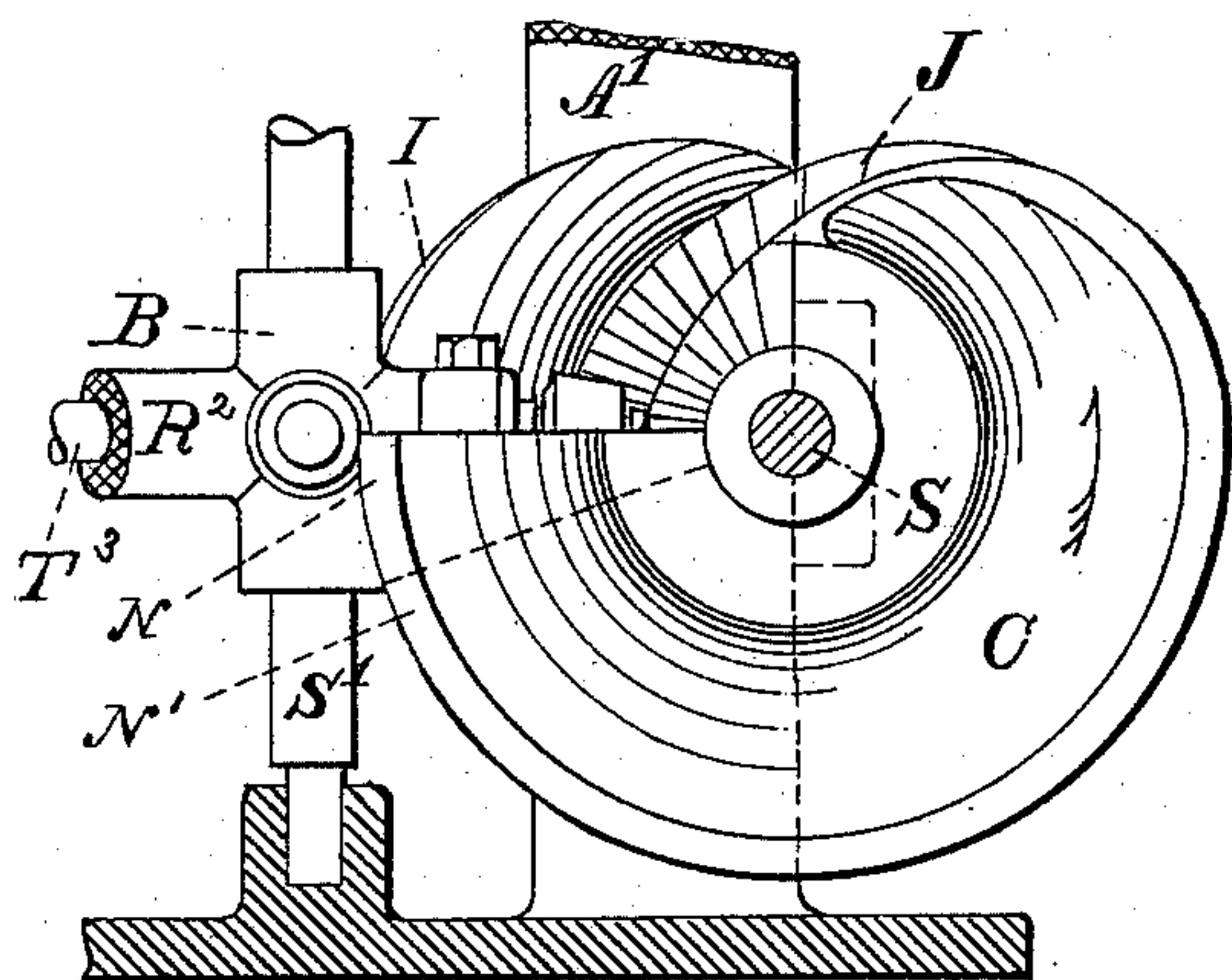
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MECHANISM FOR CONVERTING MOTION.

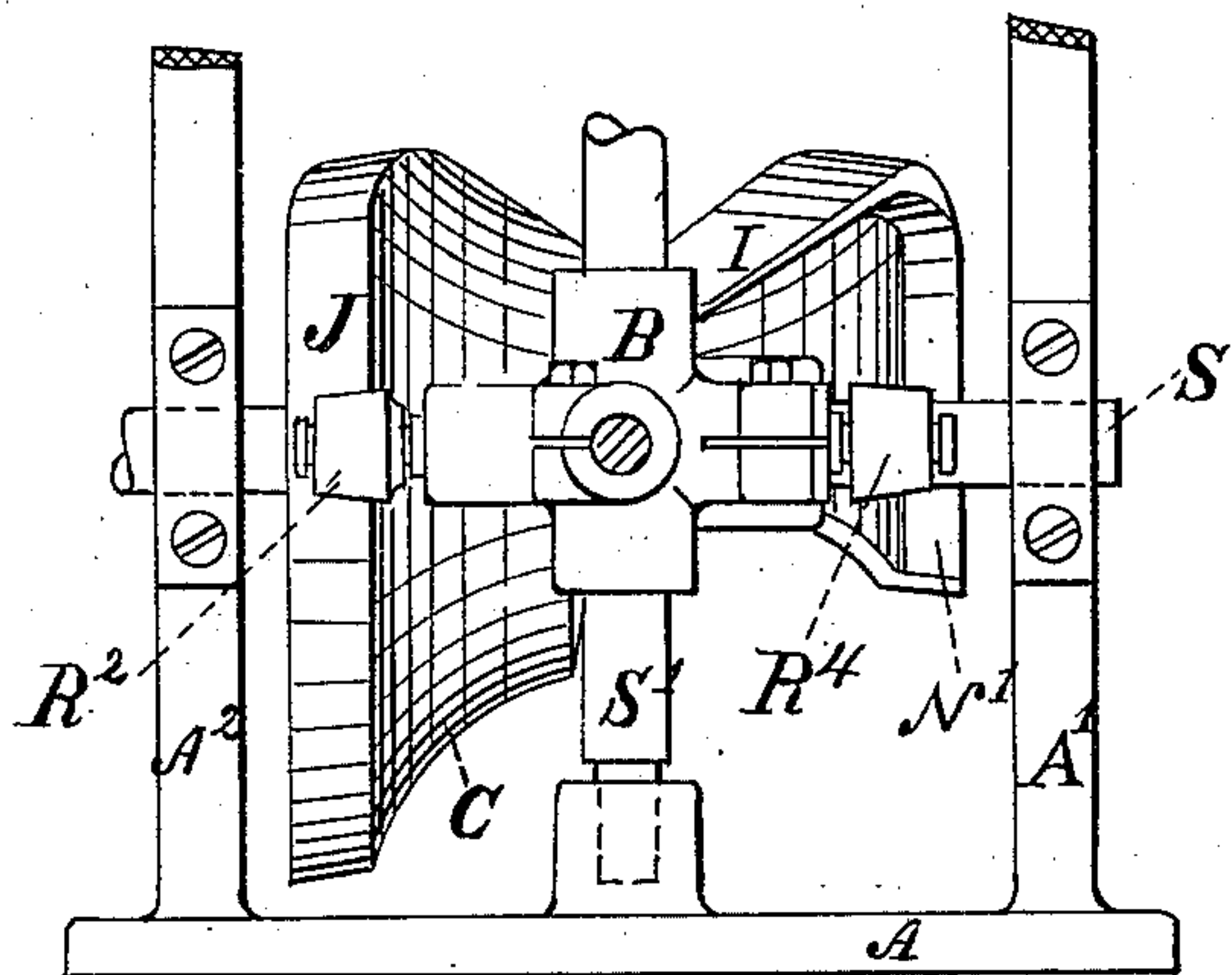
No. 297,165.

Patented Apr. 22, 1884.

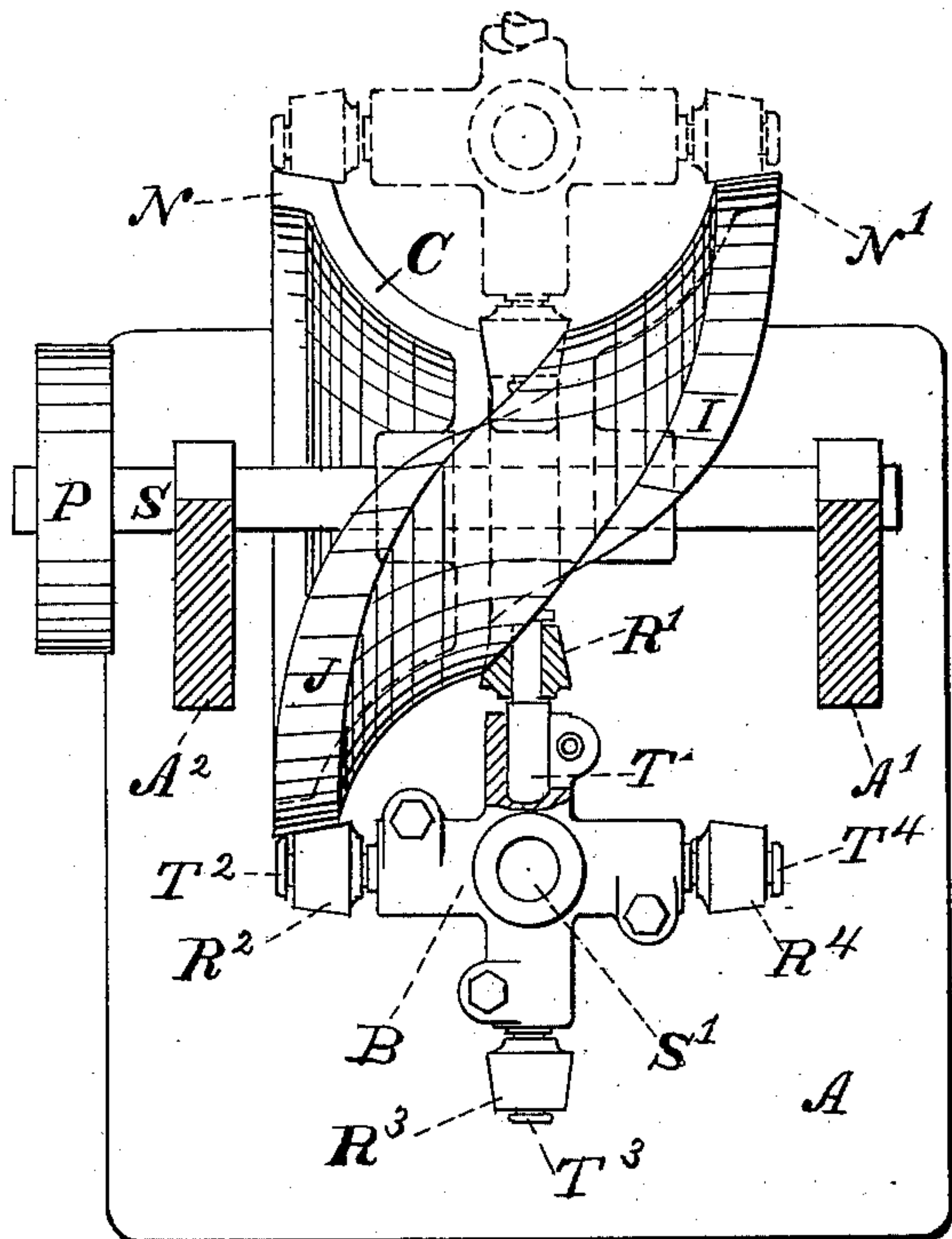
*Fig.2.*



*Fig.1.*



*Fig.3.*



**Witnesses**

C. O. Palmer.

H. W. Faulkner.

**Inventor**

Francis H. Richards.



# UNITED STATES PATENT OFFICE.

FRANCIS H. RICHARDS, OF SPRINGFIELD, MASSACHUSETTS.

## MECHANISM FOR CONVERTING MOTION.

SPECIFICATION forming part of Letters Patent No. 297,165, dated April 22, 1884.

Application filed March 10, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, FRANCIS H. RICHARDS, a citizen of the United States, residing at Springfield, in the county of Hampden and State of Massachusetts, have invented certain new and useful Improvements in Mechanism for Converting Motion, of which the following is a specification.

My invention relates to that class of devices in which continuous rotary motion is converted into intermittent rotary motion; and it consists of certain improvements upon a similar device for which Letters Patent of the United States numbered 286,225 were granted to me October 9, 1883, to which reference may be had.

Mechanism embodying my invention is shown in the drawings by three views drawn in projection, the better to illustrate the nature and present construction of the parts thereof, in which—

Figure 1 is a front elevation of the mechanism. Fig. 2 is a side elevation, a part of the frame being removed. Fig. 3 is a plan view, also partially in section.

Similar letters refer to similar parts throughout the several views.

As described in the above-named Letters Patent, the frame for supporting the operative parts is composed in the present instance of a base, two uprights, and a top piece, of which in this instance the first is lettered A and the second A' and A<sup>2</sup>, respectively, the third not being shown. This frame has bearings for supporting a continuously-revolving shaft, S, driven by pulley P or otherwise, for carrying the cam C, and a shaft, S', for carrying a roller-turret, B, whereby it is rotated intermittently. This turret has a series of arms—in the present instance four in number—situated equidistantly from each other, and formed to receive a corresponding series of roller-studs, T<sup>1</sup>, T<sup>2</sup>, T<sup>3</sup>, and T<sup>4</sup>, for carrying the cam-rollers R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup>, and R<sup>4</sup>. These rollers are preferably formed tapering; and the roller-studs made so as to be adjustably secured into the roller-turret. This may be done in a variety of ways, of which that shown in the drawings I consider the best one. If, in the making of this mechanism, the arms of that turret are not made exactly equidistant from each other, the error may—owing to the tapering form of the

aforesaid rollers—be corrected to some extent by a proper adjustment of the roller-studs longitudinally of their axes. The cam C has two faces or roller-tracks, J and I, respectively, forming the opposite edges of a wide concaved rib, extending through somewhat more than three hundred and sixty degrees, which for a part of its length, preferably at each end thereof, is of a circular form—that is, concentric with the shaft S—and which for the remaining part of its length is of a spiral form, substantially as shown. By making this rib wide enough to fill the space between the rollers upon two adjacent arms, I am able to use but one roller upon each arm—or four in all—whereas if that rib were narrow it would be necessary to use two rollers upon each arm, as described in the above-named Letters Patent. In that case each one of the four pairs of rollers is brought into use successively, while in the present case the four rollers form also four pairs, which are also used successively, each roller being used twice in succession during each revolution of the shaft S', first as the leading roller and then as the following roller of a pair of them, once on the face I and—usually afterward—once on the face J of the cam. These cam-faces extend around the cam somewhat more than one turn, so that their leading end—which is N or N', according to the direction in which the cam is revolved, being usually the latter—may enter between one pair of rollers before their following end passes from between the preceding pair, thereby securing a constant and positive control over the movements of the shaft S'. That feature of the cam is the same in my present invention as in that one described in the above-named Letters Patent, with this difference: In my former invention those two pairs of rollers consist of four single ones, while in my present invention a single roller is the following roller of the leading pair and the leading roller of the following pair, so that there are never more than three single rollers in use at any one time, instead of four, as in the former case with a ribbed form of cam. This is illustrated best in Fig. 3, where those three rollers are shown in dotted lines at the top of that view.

It will be understood that rollers are used to work against the cam-faces in order to avoid



friction, and not because they are essential to the operation of my invention, for the arms or the pins held therein may be made to terminate in a similar form and fulfill the same  
 5 function so far as relates to the conversion of motion.

It will be obvious, upon considering the arrangement and operation of the parts hereinbefore described, that the velocity and time of  
 10 the rotation of shaft S', relative to shaft S, and also the duration of the interval, if any, of rest of that shaft S' depend upon the conformation of the rib and faces of the cam C, which, therefore, should be constructed agreeably to  
 15 the number, length, and size of the turret-arms, and to the desired relative proportions of the intervals of rotation and of rest of shaft S'.

In the present instance the interval of rotation of that shaft is shown as being between one-third and one-half of a revolution of the driving-shaft S. 20

I claim as my invention—

1. The cam C and a series of arms, combined and operating substantially as described.
2. A cam, C, and a series of arms having 25 adjustable tapered ends, combined and operating substantially as described.
3. A cam, C, and a series of arms having adjustable tapered rollers, combined and operating substantially as described.

FRANCIS H. RICHARDS.

Witnesses:

C. O. PALMER,  
 H. F. L. ORCUTT.