

(No Model.)

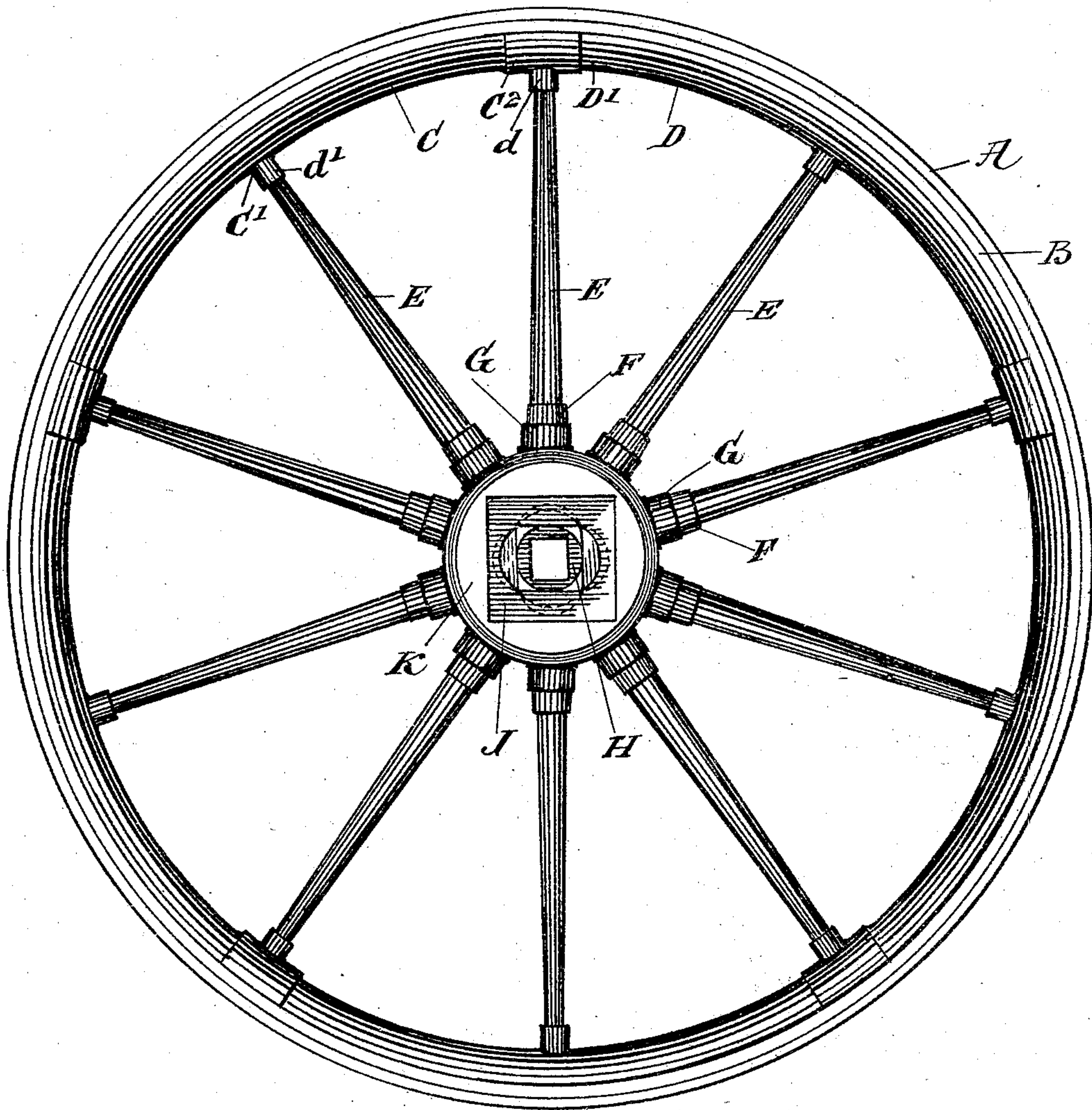
3 Sheets—Sheet 1.

T. J. THORP.  
WHEEL.

No. 433,704.

Patented Aug. 5, 1890.

*Fig. 1.*



Witnesses  
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Archib. M. Catlin

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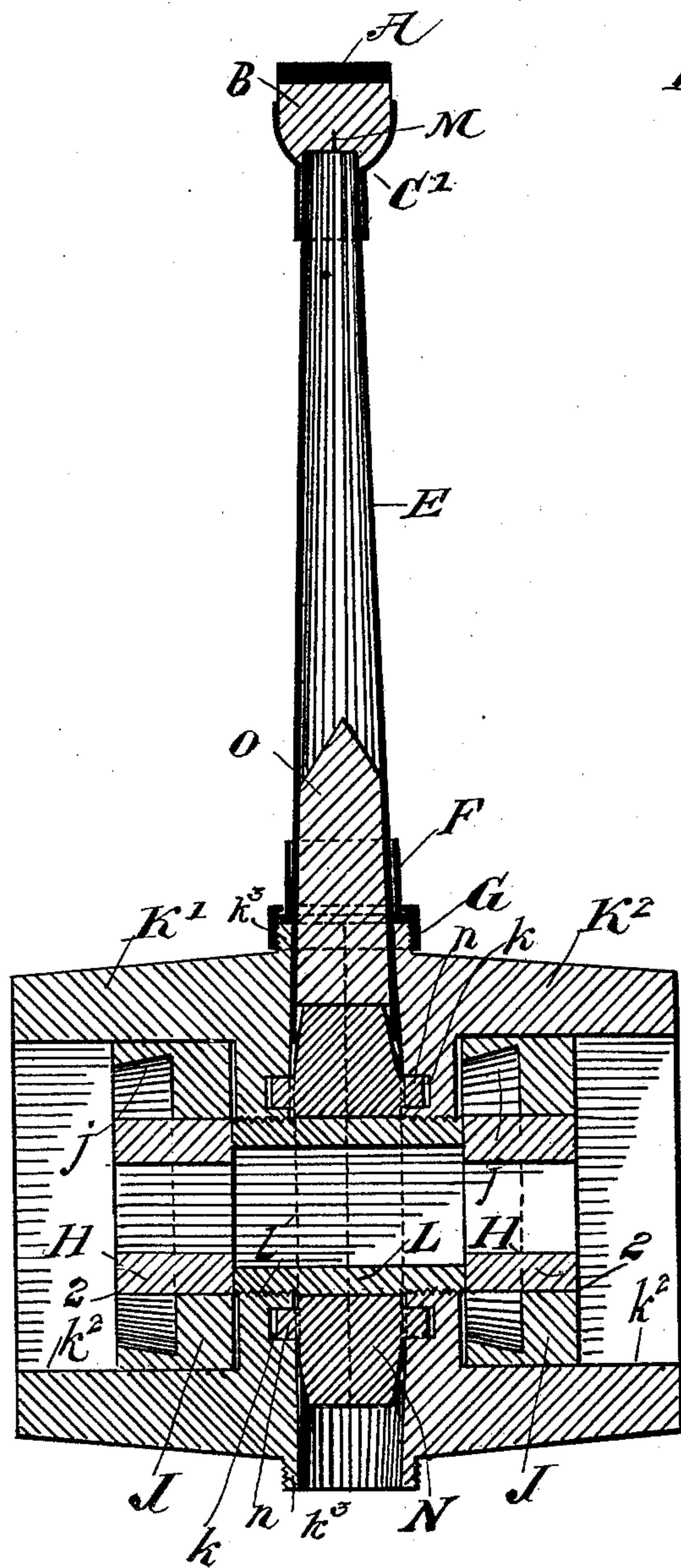


T. J. THORP.  
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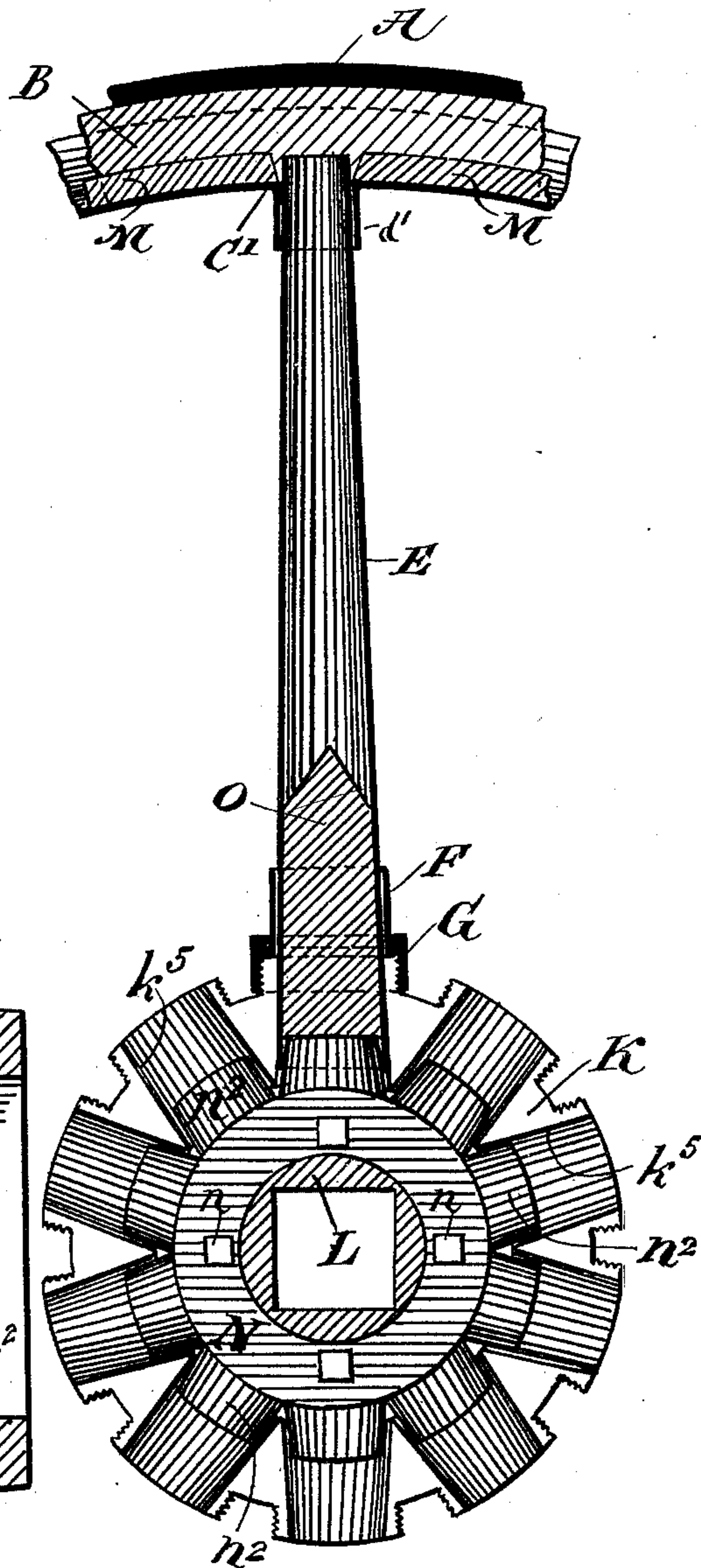
No. 433,704.

Patented Aug. 5, 1890.

*Fig. 2.*



*Fig. 3.*



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Fig. 4.

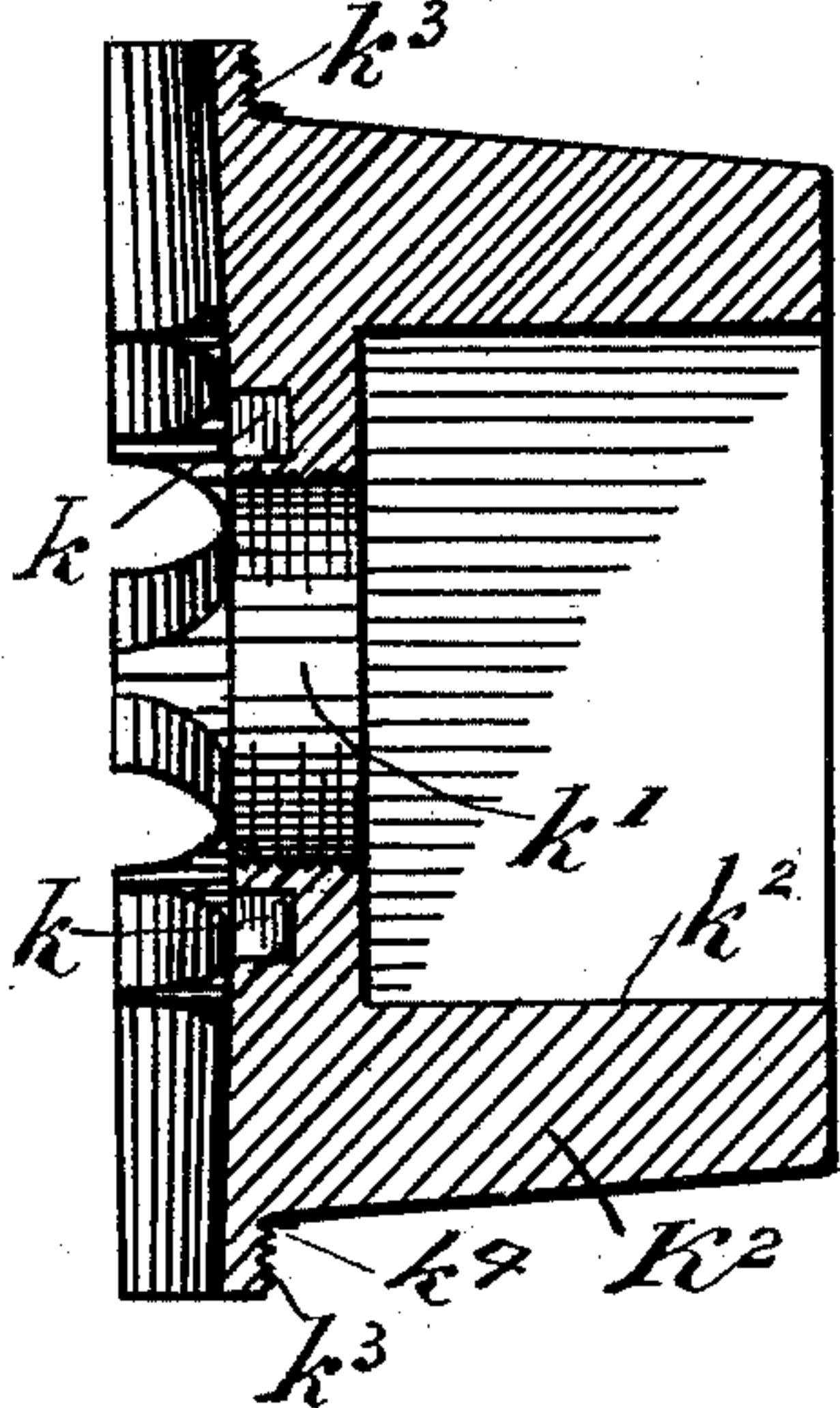


Fig. 5.

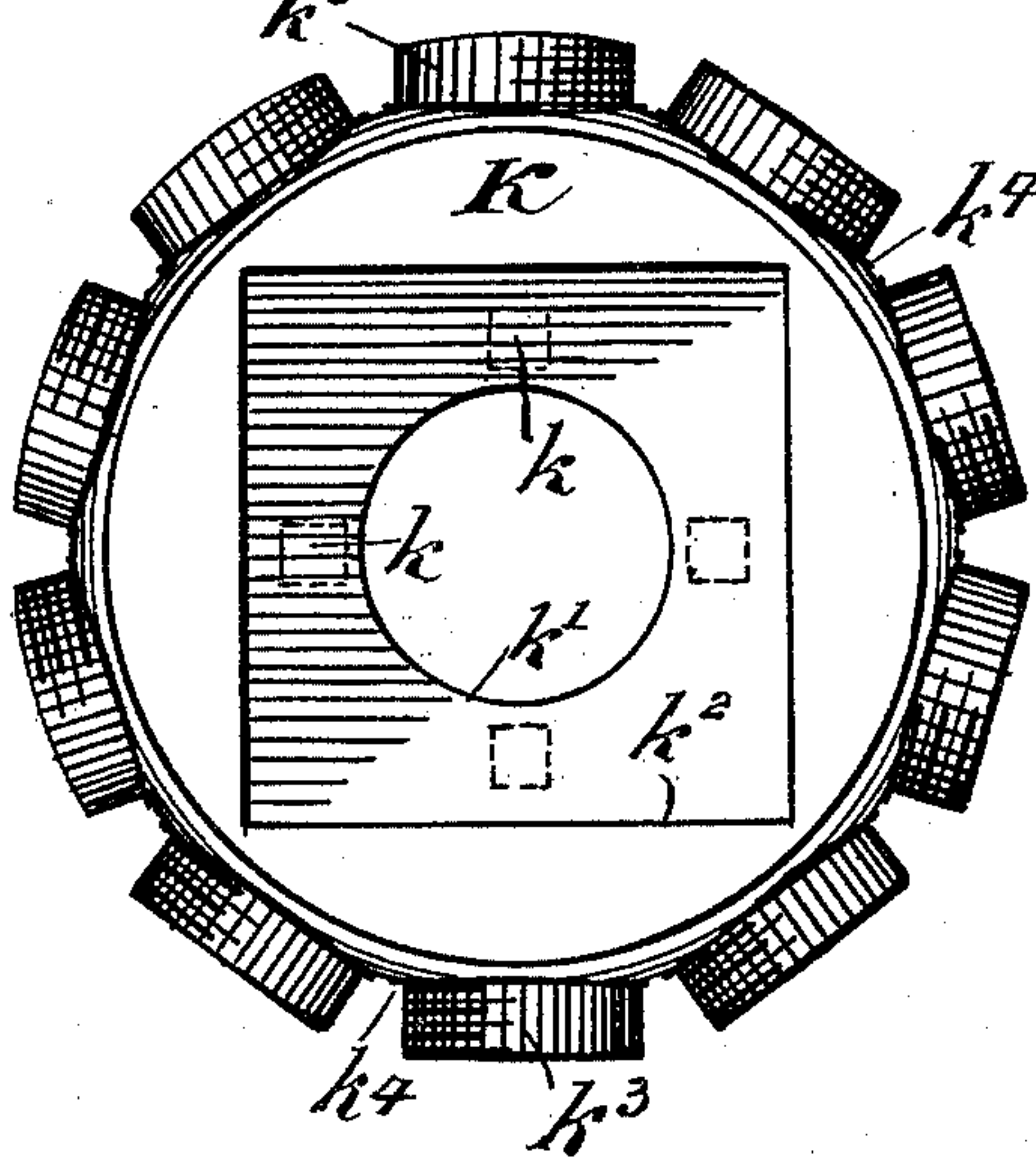


Fig. 6.

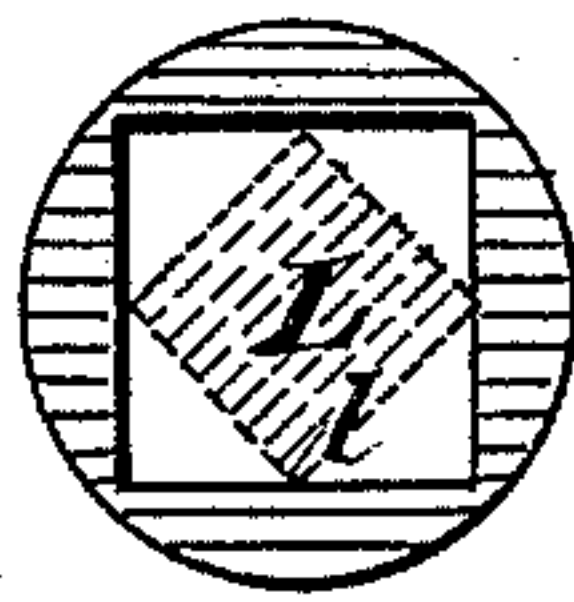


Fig. 7.

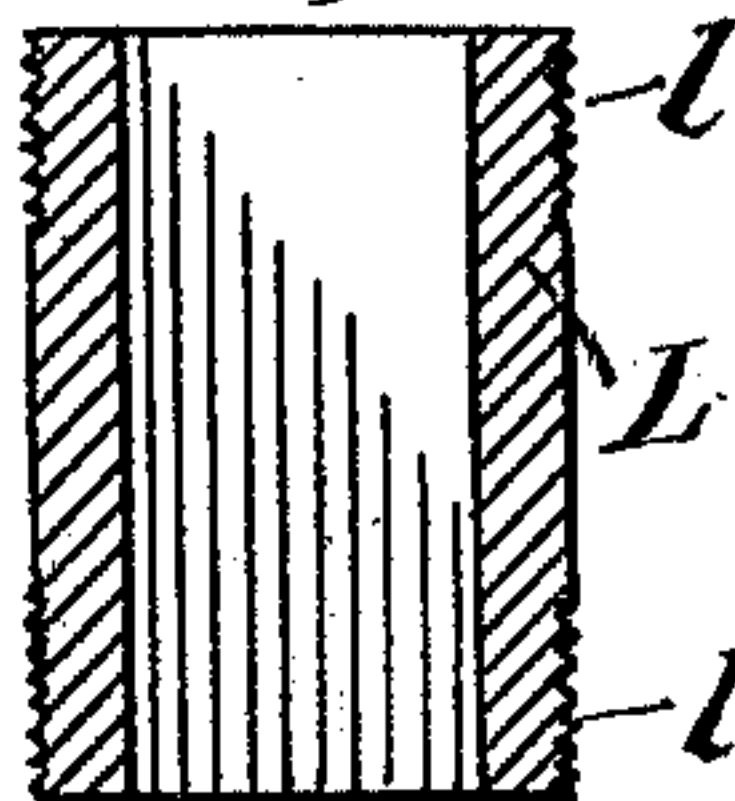


Fig. 8.

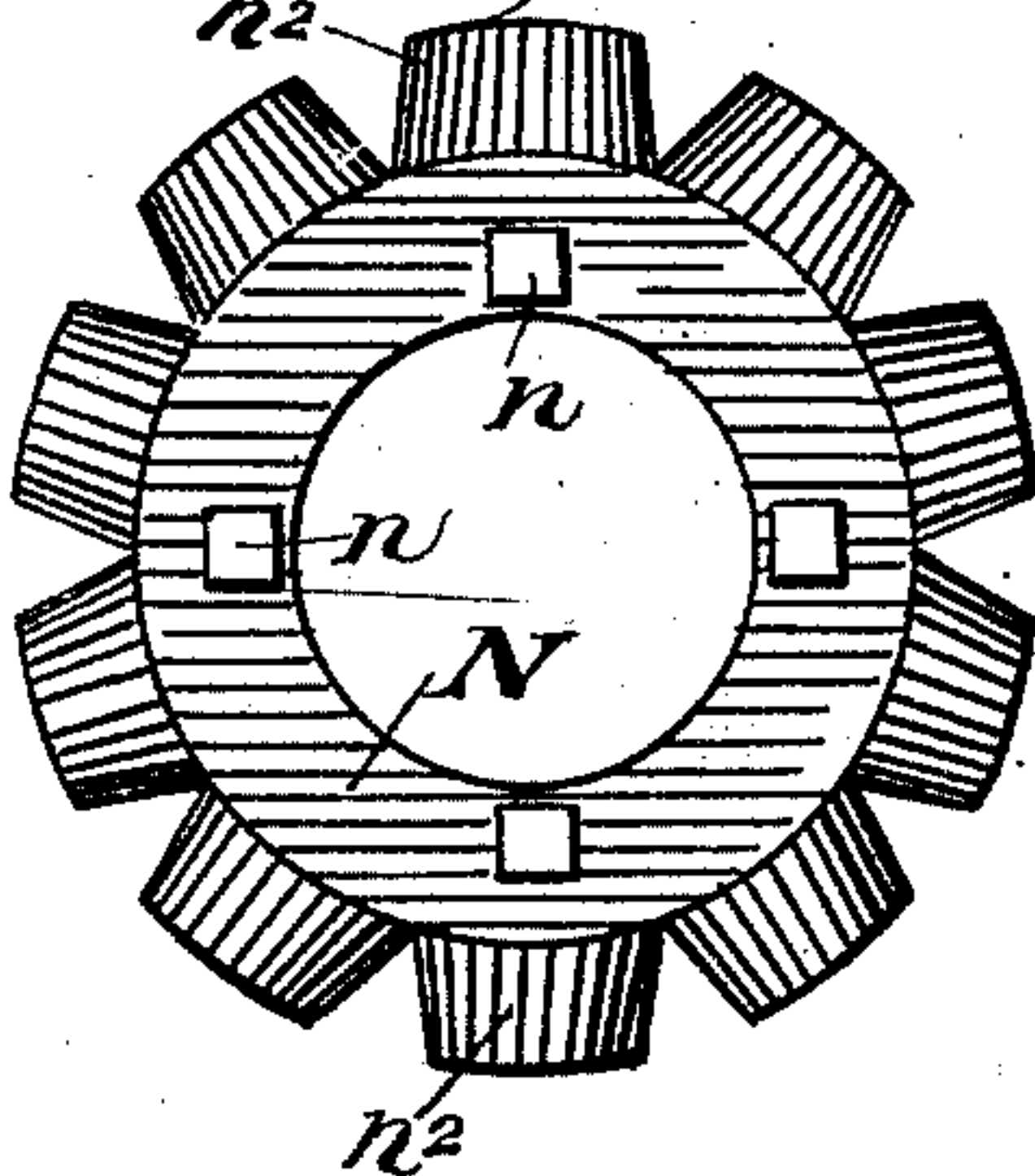


Fig. 9.

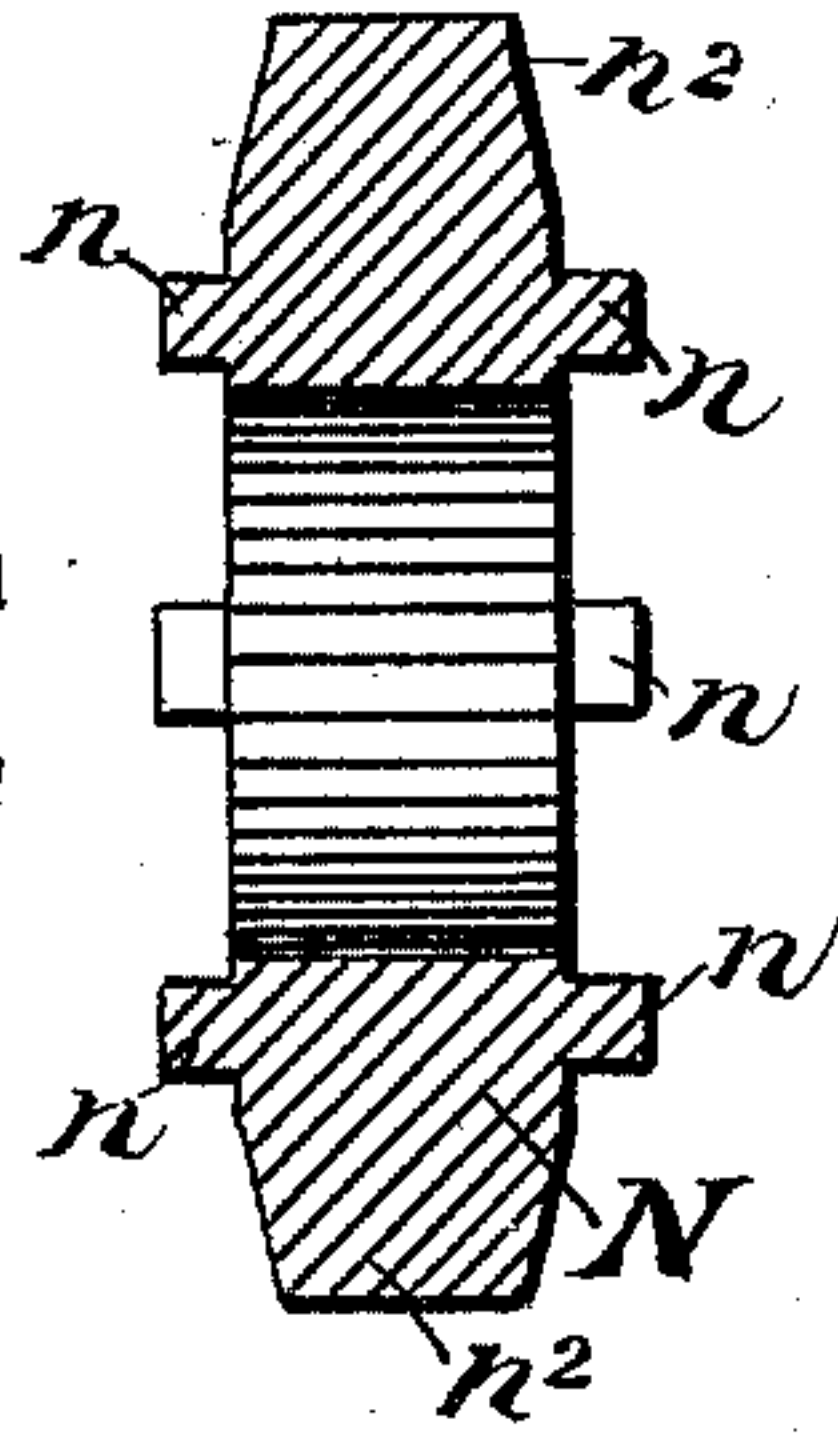


Fig. 10. Fig. 11.

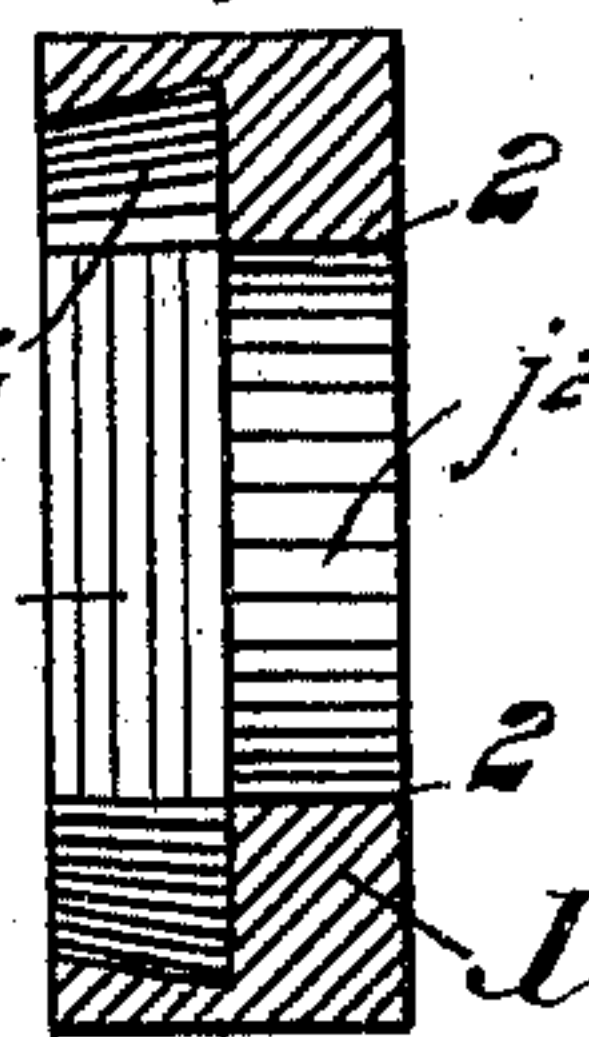
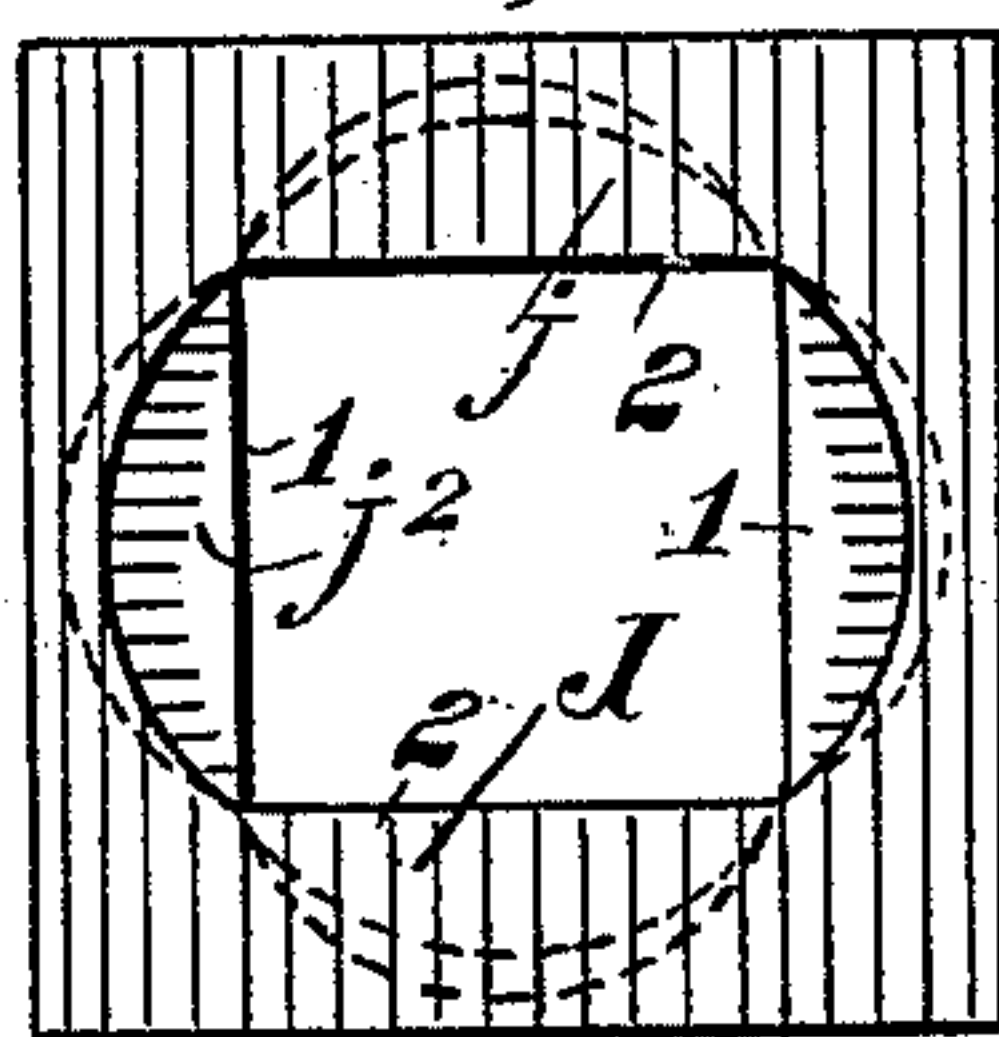


Fig. 12. Fig. 13.

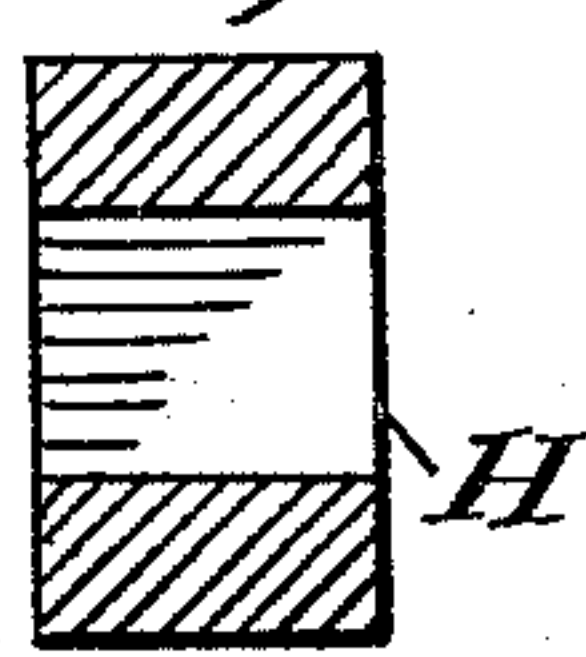
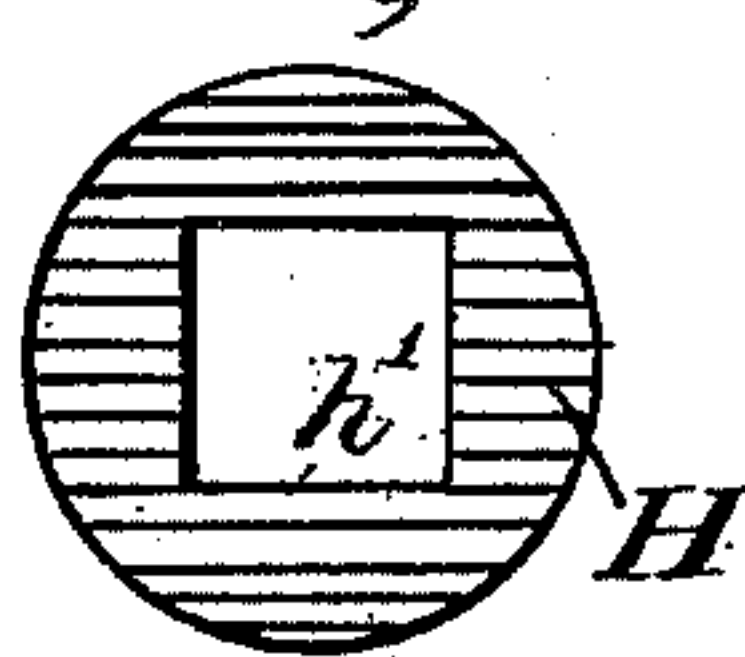


Fig. 14.

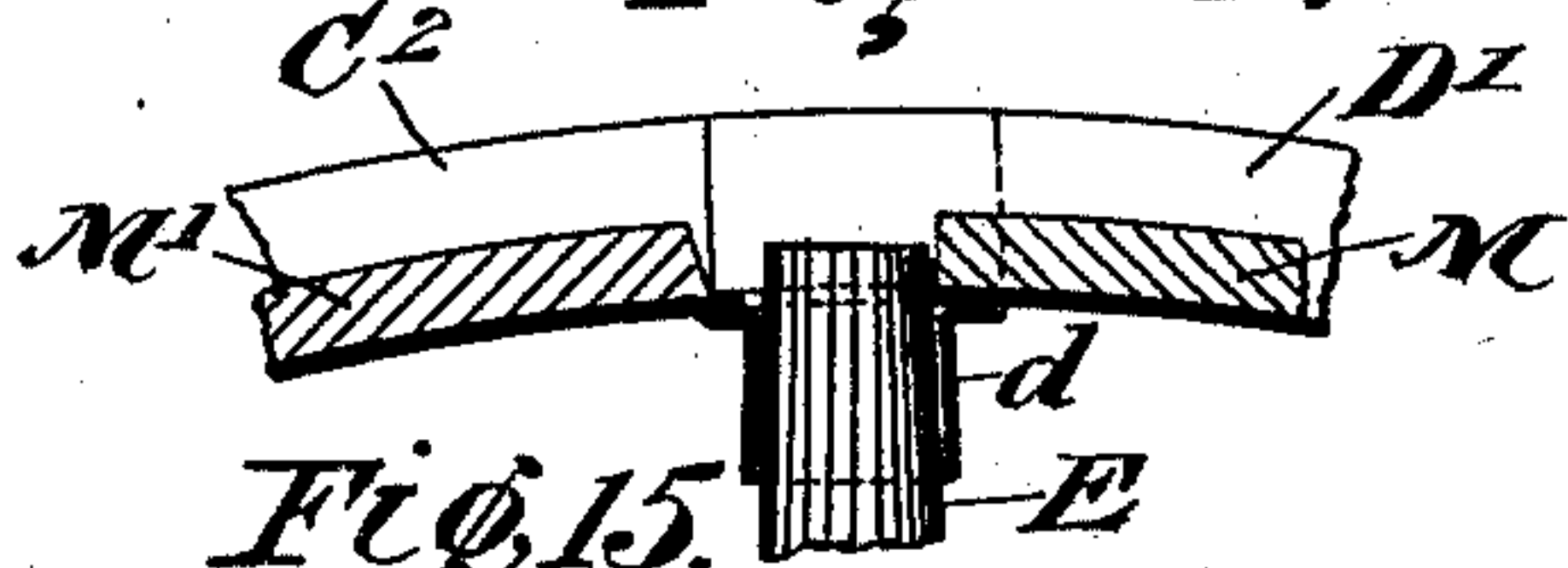
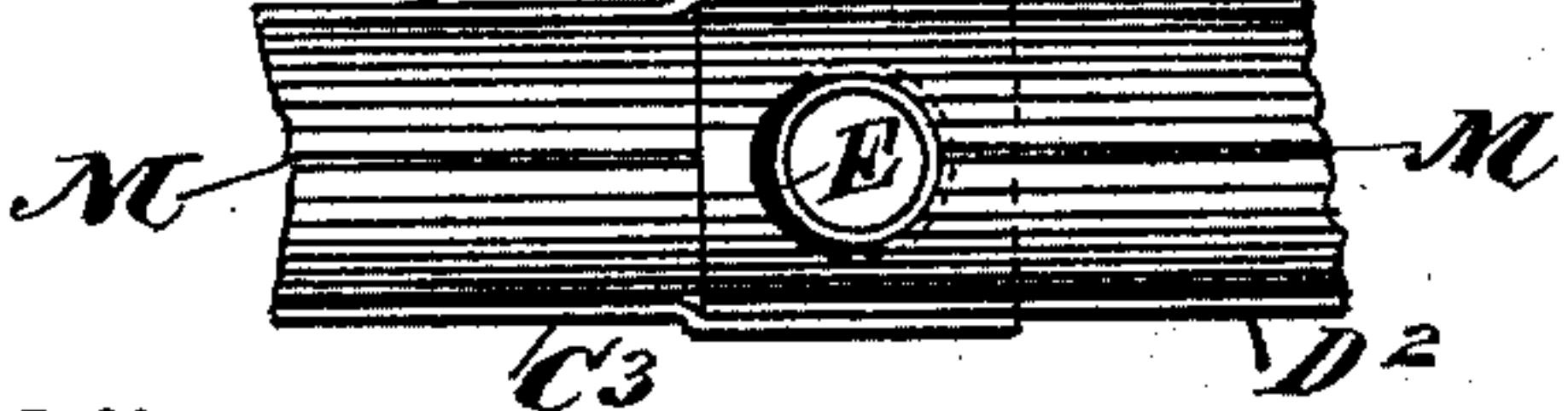


Fig. 15.



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# UNITED STATES PATENT OFFICE.

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TO D. J. BRANNEN, OF FLAGSTAFF, ARIZONA TERRITORY, AND GEORGE  
M. LOCKWOOD, OF WASHINGTON, DISTRICT OF COLUMBIA.

## WHEEL.

SPECIFICATION forming part of Letters Patent No. 433,704, dated August 5, 1890.

Application filed February 19 1890 Serial No. 341,088. (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS J. THORP, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Wheels; 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 the same.

The object of my invention is to provide a durable metallic wheel consisting of parts of standard size and so made that they can be assembled without difficulty, each part being readily replaceable; and the invention consists in the construction hereinafter described and pointed out.

In the accompanying drawings, Figure 1 is a side elevation. Fig. 2 is a central section through a spoke and hub. Fig. 3 is a similar view taken at right angles to Fig. 2. Fig. 4 is a central longitudinal section of one of the hub-sections. Fig. 5 is an elevation of the same. Figs. 6 and 7 are respectively an elevation and longitudinal section of a coupling-cylinder. Figs. 8 and 9 are similar views of a spoke-ring. Figs. 10 and 11 are like views of an axle-box. Figs. 12 and 13 are like views of an axle-sleeve. Fig. 14 is a central longitudinal section of the metallic part of the felly where it overlaps, and Fig. 15 is a plan of the same.

A denotes a tire, B a felly, made of wood, paper, or like elastic material, and C D sections of a metallic grooved rim in which the felly B is secured. Part of these sections are made to overlap others, as shown at C<sup>2</sup>, and have the overlapping part provided with a socket or thimble *d*, adapted to receive a spoke E.

*d'* indicates a socket formed on section C at C', between the ends of the sections M of a flange or rib on the rim, extending between two spokes and adapted to enter suitable recesses in the felly to re-enforce the same vertically. The spoke passes through a hole in section D, said hole being elongated to permit contraction of the wheel in setting the tire.

K is the hub, composed of two sections K' and K<sup>2</sup>, coupled together by a cylinder L,

screw-threaded at L' and engaging the threaded portions of sections K' K<sup>2</sup>. In the inner ends of the hub-sections are recesses *k*, adapted to receive the lugs *n*, formed on the spoke-ring. This coupling has a rectangular passage through it large enough to permit the revolution of the wheel on the axle, as indicated in Fig. 6, the axle being represented by dotted lines.

On the spoke-ring N are formed projections *n*<sup>2</sup>, that fit the cylindrical openings *k*<sup>5</sup>, (see Fig. 3,) formed half in each hub-section. These projections *n*<sup>2</sup> receive and fit the inner ends of the spokes, and upon them within the spokes are placed the strengthening or re-enforcing cores O, made of wood or other elastic material. These serve to support the tubular spokes at the point where they are subjected to the greatest strain, and they also furnish an elastic cushion for the spokes adapted to receive without injury the blows which may in use be transmitted from the tire. The felly is also elastic, and the spokes are cushioned or protected by elastic material at both their outer and inner ends. The spokes are each secured in the hub and upon the spoke-ring by means of a flanged ring or nut G, engaging a flanged sleeve F, which screws on the split socket *k*<sup>3</sup>. These nuts and sleeves also support and strengthen the spokes at the point of greatest stress.

J indicates an axle-box, of which there are two in each hub, which are slipped into the seats *k*<sup>2</sup> and held therein by the usual nut on the end of the axle, the inner one bearing against a suitable shoulder on said axle. The box J is provided with an oblong chamber *j*, approximately elliptical in form, but having its two sides 1 1 parallel and transversely to this chamber, and at its side is arranged a similar chamber *j*<sup>2</sup>, having parallel sides 2 2. These chambers are at their ends undercut or have their end walls flared inwardly, forming depressions or pockets in the boxes. (See Fig. 11 and dotted lines in Fig. 10.) The sides 1 1 of one chamber are not in the same plane as the sides 2 2 of the adjoining chamber, as will be understood. The aforesaid depressions at the ends of the chambers are used as oil-cups.

H is a sleeve adapted to fit the square axle,



and this sleeve bears on the plane faces or sides 1 1 2 2 of the inner parts of the axle-box as it revolves thereon. In operation the bearing of this axle-sleeve will be alternately upon the corresponding faces 2 2 of the two boxes, then upon the similarly-placed faces 1 1 of the exterior and interior boxes, next upon 2 2, then upon 1 1, and so on, the vertical plane of the bearings in the two boxes being changed with every quarter-revolution. During this operation the lubricating-oil is poured from the above-described recesses down upon the sleeves H and effectually lubricates them.

The coupling-cylinder L is provided with an interior passage having such diameter that it can freely turn about the square axle. (See dotted lines, Fig. 6.)

To assemble the parts above described, the coupling-cylinder L can be held by passing through its rectangular opening a similarly-shaped bar and then screwing upon each end a hub-section  $K'$  or  $K^2$ , the spoke-ring N being suitably introduced and the spokes with internal plugs or cores O placed on the projections or hubs  $n^2$ . The semi-cylindrical or split hubs  $k^3$  are secured together about the spoke by the screw ring or sleeve G, which also serves to draw down upon the larger end of the spoke the flanged sleeve F. The outer ends of the spokes are entered in the sockets  $d d'$ , the metallic grooved rim C D and the elastic felly fitted therein being secured upon the spokes by the contraction of the metal tire in the usual way.

Every part of the wheel can be replaced when injured or worn by another of the same standard size by any person of ordinary skill. Metal is used altogether except for the fellies and the elastic plugs, and these furnish an elastic support at both ends of the spokes, as before said.

The spokes are not normally extended to the base of the hubs  $k^3$ , but have some freedom to move thereon when the cores O are compressed by any considerable blow upon the tire, and the elasticity of these cores and of the fellies renders the wheel much more durable than those made of cast metal or having cast-metal spokes.

The alternate shifting of the bearings of the axle-sleeve with every quarter-revolution and the very efficient means for lubricating are important features of this improvement, by which the overheating and wearing of the axle is obviated, and, further, these parts can be removed and others substituted with ease at any time.

Some parts of the present invention are capable of use in wheels differing in many respects from the preferred form illustrated, and the details and proportions may be va-

ried to some extent without substantially affecting the construction.

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

1. The combination, in a wheel, of a tire, the elastic felly seated in the metallic rim, and the tubular spokes extending from the fellies to the hub and secured thereto and inclosing an elastic plug, substantially as set forth.

2. In a wheel, the combination, with a tire and fellies, of tubular spokes having each an elastic core or plug, the spokes and the plugs being entered in hollow thimbles or hollow projections and secured therein by screw-threaded sleeves embracing said thimbles, substantially as set forth.

3. The combination of the tire and felly with the spokes, the hub made in sections and coupled together, and the spoke-ring having lateral projections or studs adapted to enter recesses in the hub-sections, substantially as set forth.

4. In combination with the recessed hub, a box having oblong or approximately elliptical chambers transversely placed with respect to each other, substantially as set forth.

5. In combination with the recessed hub, a box having oblong or approximately elliptical chambers transversely placed with respect to each other, each having two parallel walls, substantially as set forth.

6. In combination with the recessed hub, a box having oblong or approximately elliptical chambers transversely placed with respect to each other, each having two parallel walls, and oil-receptacles at the end of the chambers, substantially as set forth,

7. The combination of the hub having the recesses and the boxes having oblong communicating chambers arranged transversely with respect to each other, with the rectangular axle provided with cylindrical bearing-sleeves fitted to said axles, substantially as set forth.

8. In combination with the spokes of a wheel, the metallic rim made in sections and adapted to receive a felly, substantially as set forth.

9. In combination with the spokes of a wheel, the metallic rim made in sections, one of which is provided with a thimble and the other with an elongated opening to receive the ends of said spokes, substantially as set forth.

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

THOMAS J. THORP.

Witnesses:

BENJ. R. CATLIN,  
EDUARD CASHMAN.