

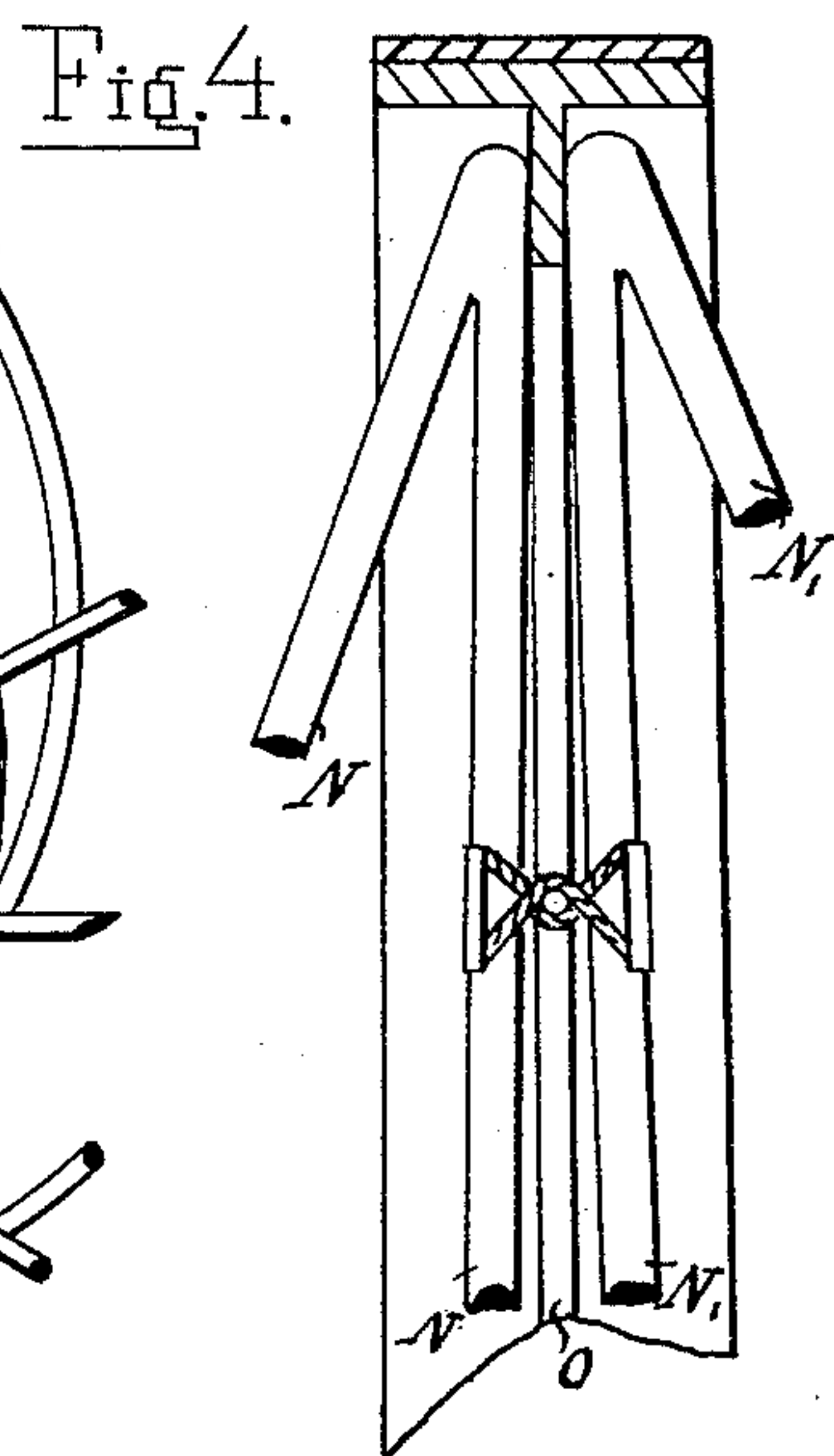
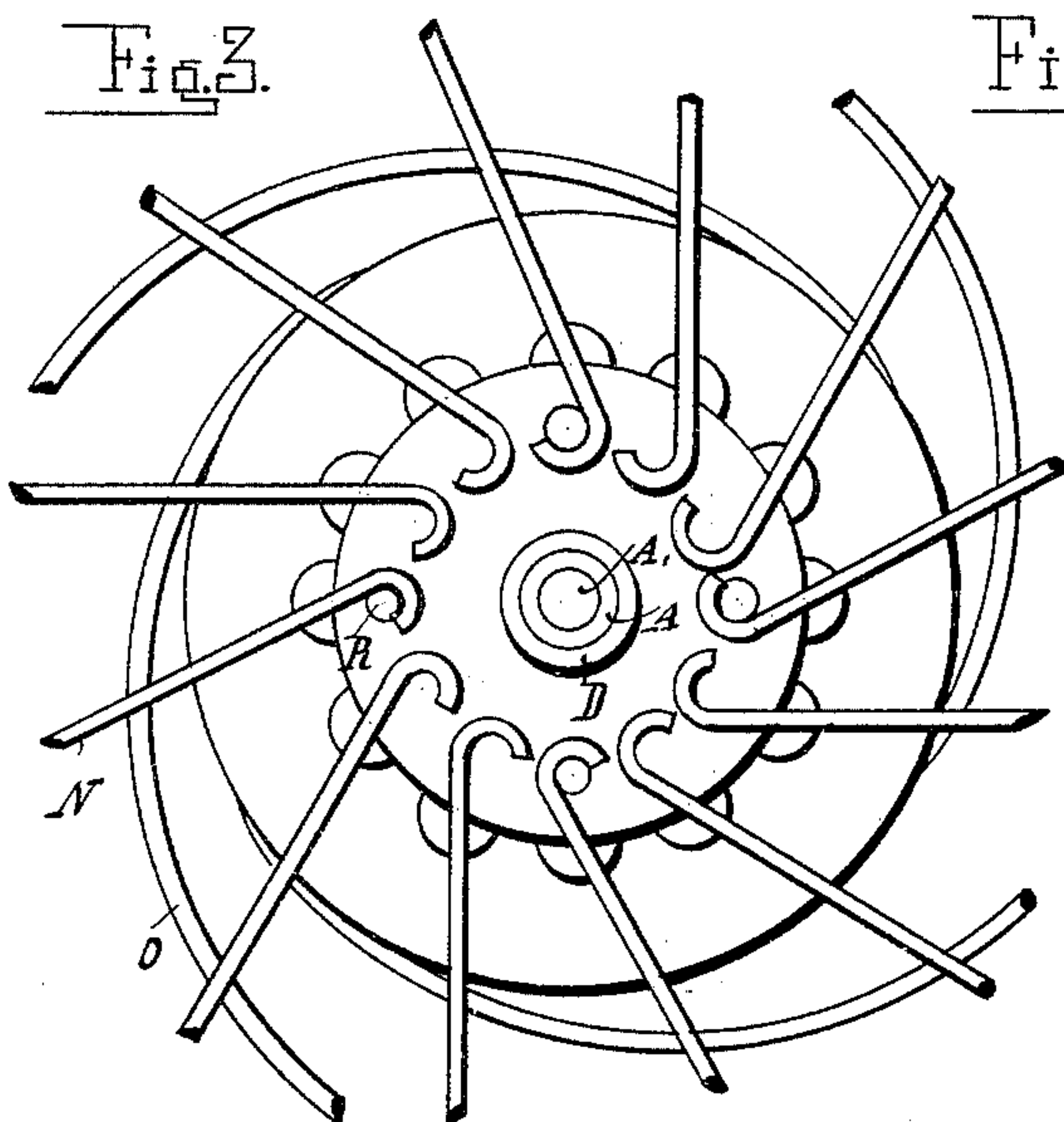
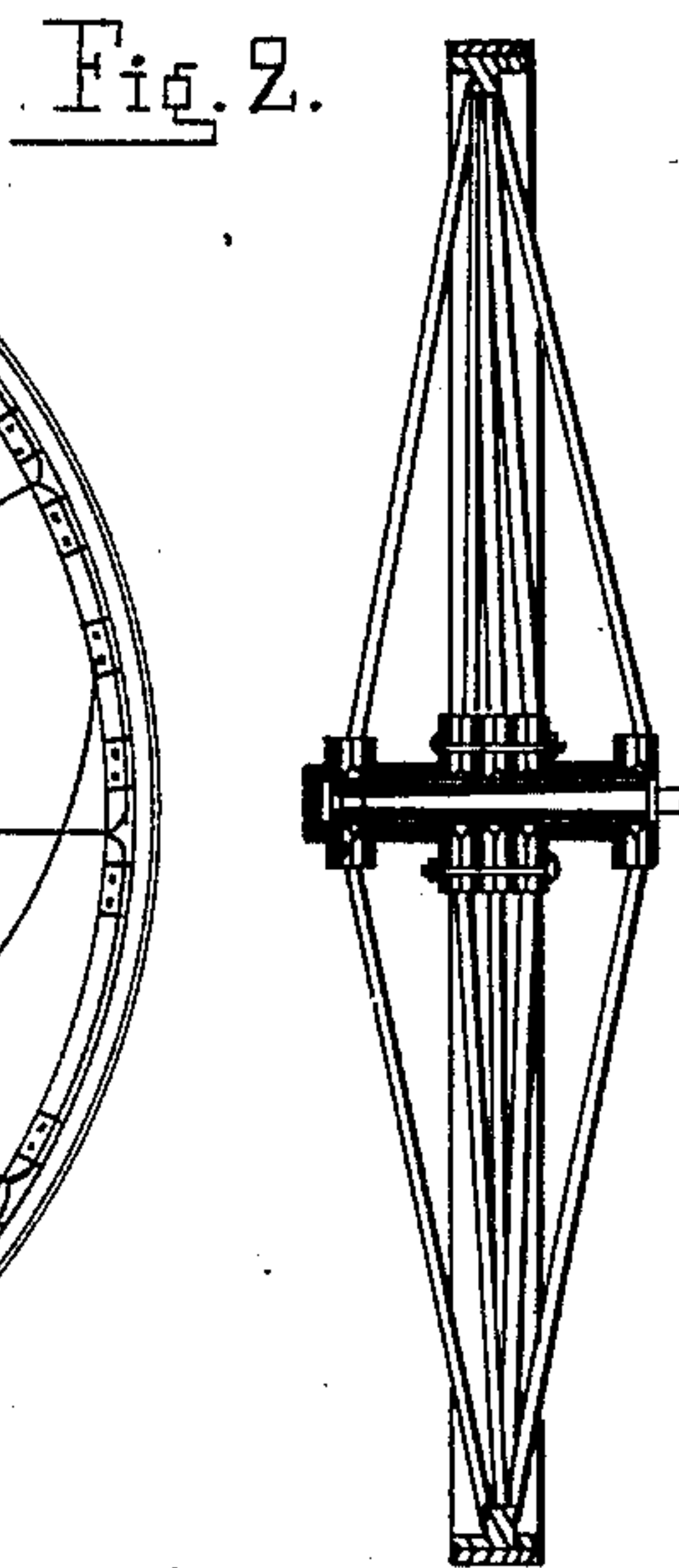
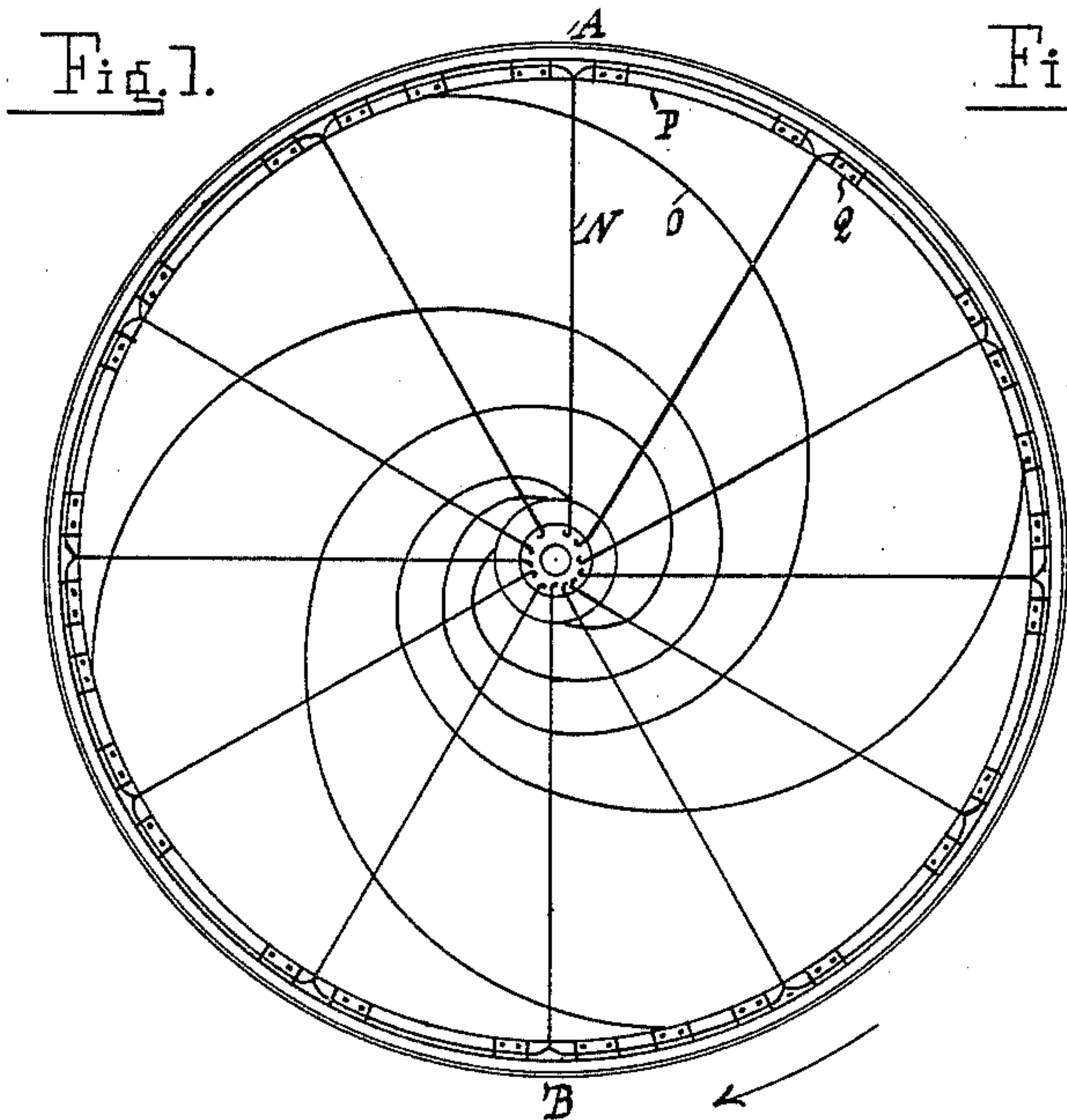
(No Model.)

2 Sheets—Sheet 1.

C. T. WOLLMANN.
WAGON WHEEL.

No. 462,387.

Patented Nov. 3, 1891.



Witnesses:
Carl Köhler.
H. Bantze.

Inventor:
Carl Theodor Wollmann
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Attorney

(No Model.)

2 Sheets—Sheet 2.

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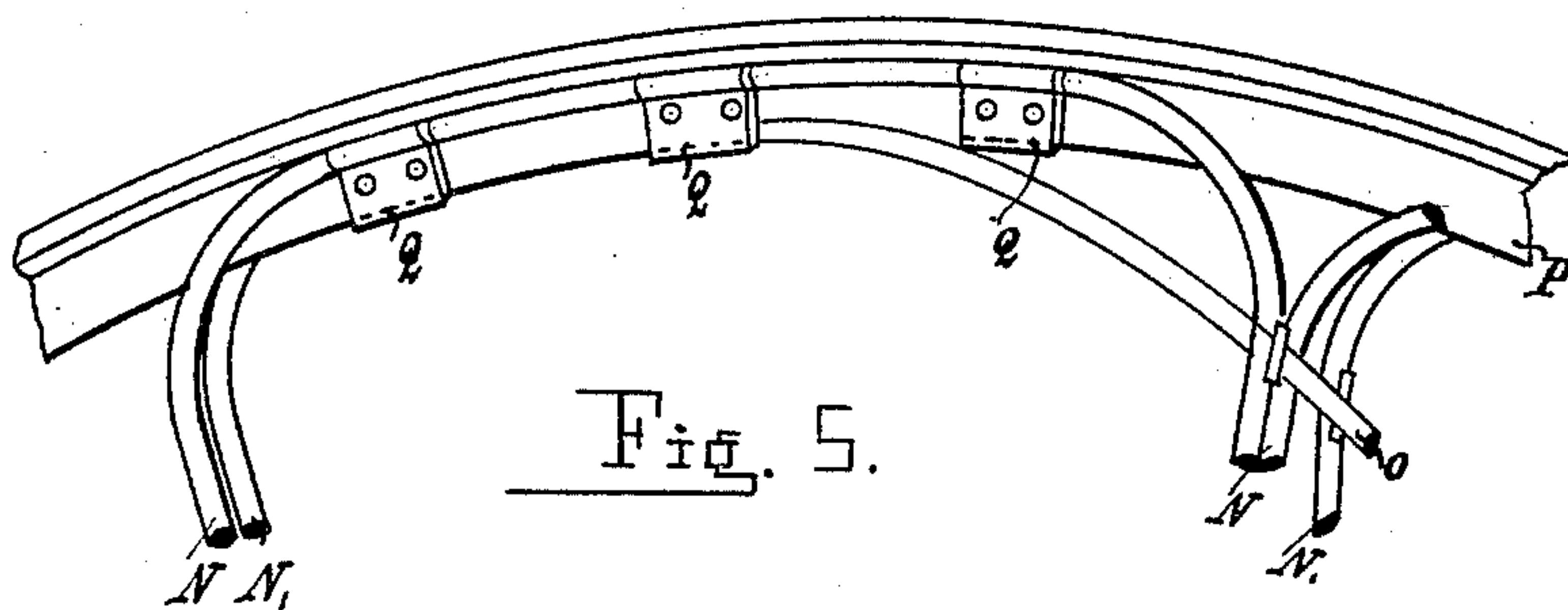
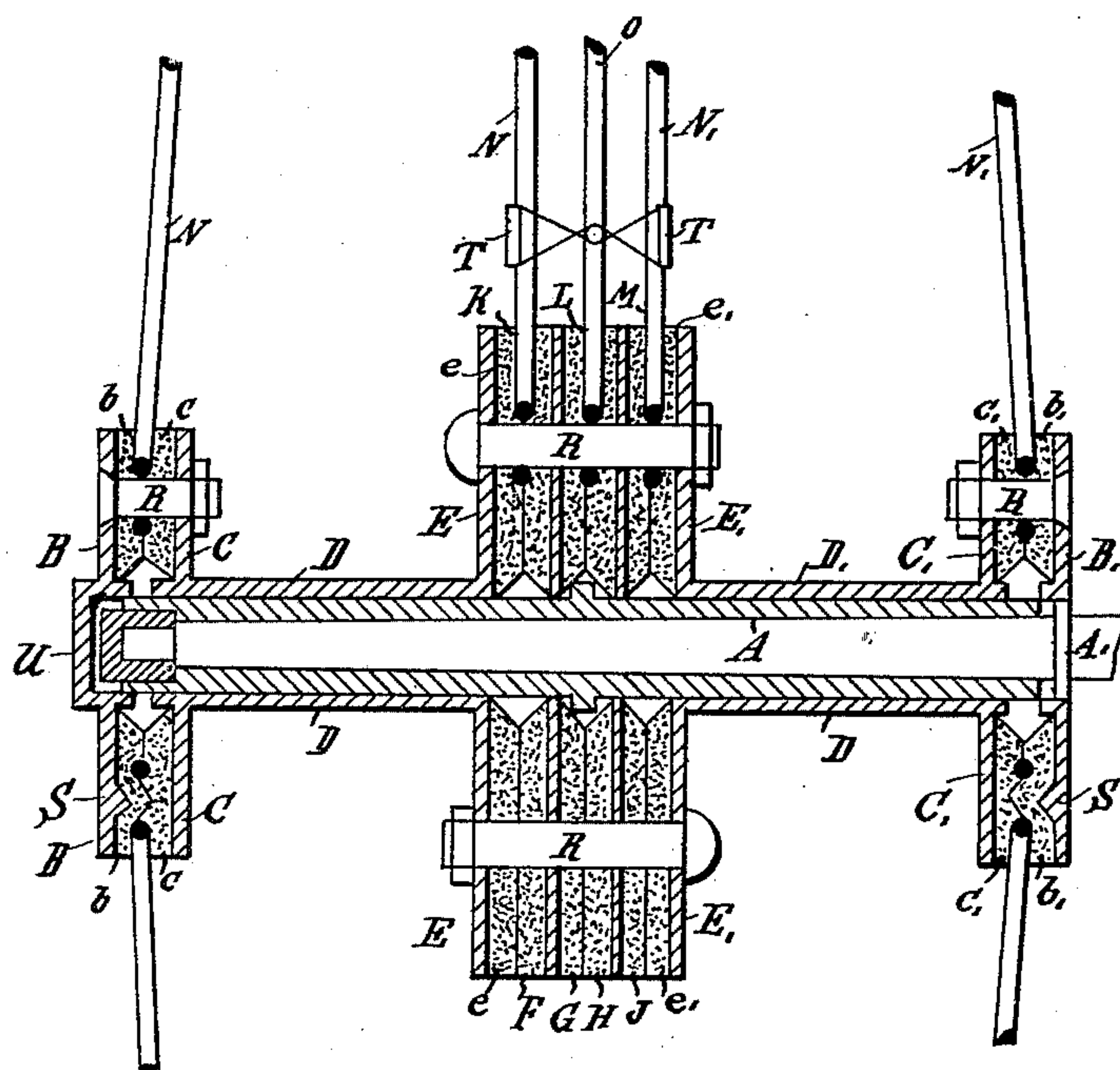


Fig. 6.



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UNITED STATES PATENT OFFICE.

CARL THEODOR WOLLMANN, OF BERLIN, GERMANY.

WAGON-WHEEL.

SPECIFICATION forming part of Letters Patent No. 462,387, dated November 3, 1891.

Application filed April 22, 1891. Serial No. 390,070. (No model.)

To all whom it may concern:

Be it known that I, CARL THEODOR WOLLMANN, engineer, a subject of the Emperor of Germany, and a resident of Berlin, in the German Empire, have invented certain new and useful Improvements in Wheels, of which the following is a full, clear, and exact description.

My invention relates to wheels for carriages, wagons, and vehicles of every description; and its object is to provide a wheel so constructed as to prevent the jolting of the wagon, &c., being transferred directly to the axle, and at the same time to provide a strong, durable, and light wheel. I attain this object by arranging elastic or spring spokes in the wheel in such manner, as hereinafter more particularly described, and illustrated in the accompanying drawings, in which—

Figure 1 represents a side elevation; Fig. 2, a section on line A B, Fig. 1; Fig. 3, a detail view showing the arrangement of the spokes in the nave; Fig. 4, a front elevation of the point of juncture of the spokes and felly; Fig. 5, a side elevation of Fig. 4, and Fig. 6 a cross-section through the nave.

Similar letters represent similar parts throughout the several views.

A is the nave of the wheel, supported on the axle-tree A' of the usual construction. The long tubular nave A is provided at each end with circular flanges B B', attached to the former by means of short sleeves and provided with elastic or cushioning disks *b b'* on their inner sides. Two sleeves D D', inclosing the nave inside the end flanges, are flanged on their outward ends at C C', said flanges being also provided with elastic or cushion disks *c c'* similar to *b b'*. The ends of the sleeves D D', which lie at or toward the center of the nave, are also provided with flanges E E', forming a support for the retaining-bolts of the central system of spokes. Between the flanges E E' are arranged six elastic or cushion disks *e e'* F G H J in such manner as to form three divisions or compartments K L M, in combination with two metallic disks arranged between each two cushions. Three sets of spokes N O N' are arranged, one in each of the said compartments K L M, of which the two sets N N' are of similar construction. The central set O is preferably formed of four or more spokes *o*, which

commence in the compartment L of the nave and curl round the same about one and one-fourth times in the form of a logarithmic curve, ending at the felly P, to which they are secured by means of a tie or any other convenient mechanical device. The two side sets N N' extend from the compartments K and L of the nave direct to the rim of the wheel, where they are bent round in a short curve, running along the felly a short distance, to which they are secured by ties or fish-plates Q, Fig. 5. They are then bent outward, Fig. 4, and extend downward to one or the other of the two end compartments formed by the flanges B C or B' C', Fig. 6.

In the respective compartments or divisions of the nave the spokes are secured between the cushions by means of bolts R or rivets S or pins, whereby the whole nave is held tight and then covered with a cap U.

In order to equalize or divide the jolts or concussions of the vehicle among all the spokes at those points where the spokes of the central system O cross the spokes N N', the former are coupled to the latter by means of ties T, Figs. 5 and 6. The main advantages of wheels constructed on this system are that the concussions of the vehicle, instead of being transferred directly to the axle, are met and taken off by the elastic spokes, thus relieving the axle and making traveling over heavy and rough ground considerably safer and easier. Further, in case of a breakdown, wheels constructed on my system can be more easily repaired. In addition to this, such wheels combine great strength and durability with a very light weight.

Having now particularly described and ascertained the nature of my said invention, what I claim is—

1. In wheels with spring-spokes, a central system of spokes arranged at the center of the nave, extending around the same in a logarithmic curve and ending at the felly, in combination with the two side systems of spokes extending from the two outward central compartments of the nave to the felly and back to the outside nave compartments, as described and shown.

2. The combination of the tubular nave having the compartments K L M formed by the metallic flanges E E', with intermediate cush-

ioning-disks *e e'* F G H J and interior stiffen-
ing-disks, as specified, said compartments hav-
ing retaining-bolts R for the three sets of
spokes, and the end compartments B C and
5 B' C' having cushioning-disks and retaining
bolts for the outward systems of spokes N N',
substantially as described and shown.

In witness whereof I hereunto set my hand
in presence of two witnesses.

CARL THEODOR WOLLMANN.

Witnesses:

W. BAUTZE,

M. BAUTZE.