

No. 814,580.

PATENTED MAR. 6, 1906.

G. H. WILLIAMS.
VEHICLE WHEEL.

APPLICATION FILED AUG. 31, 1905.

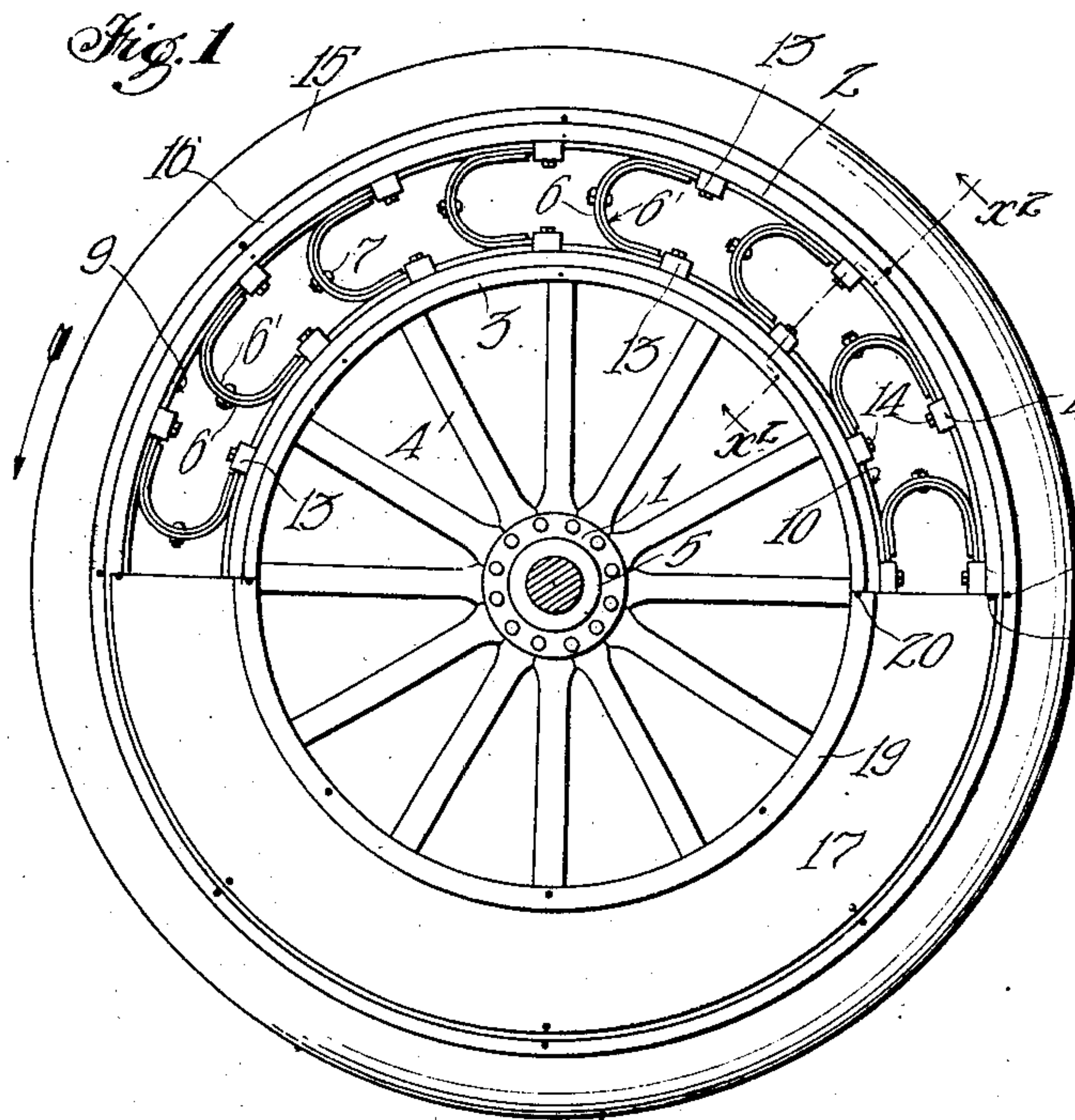


Fig. 2

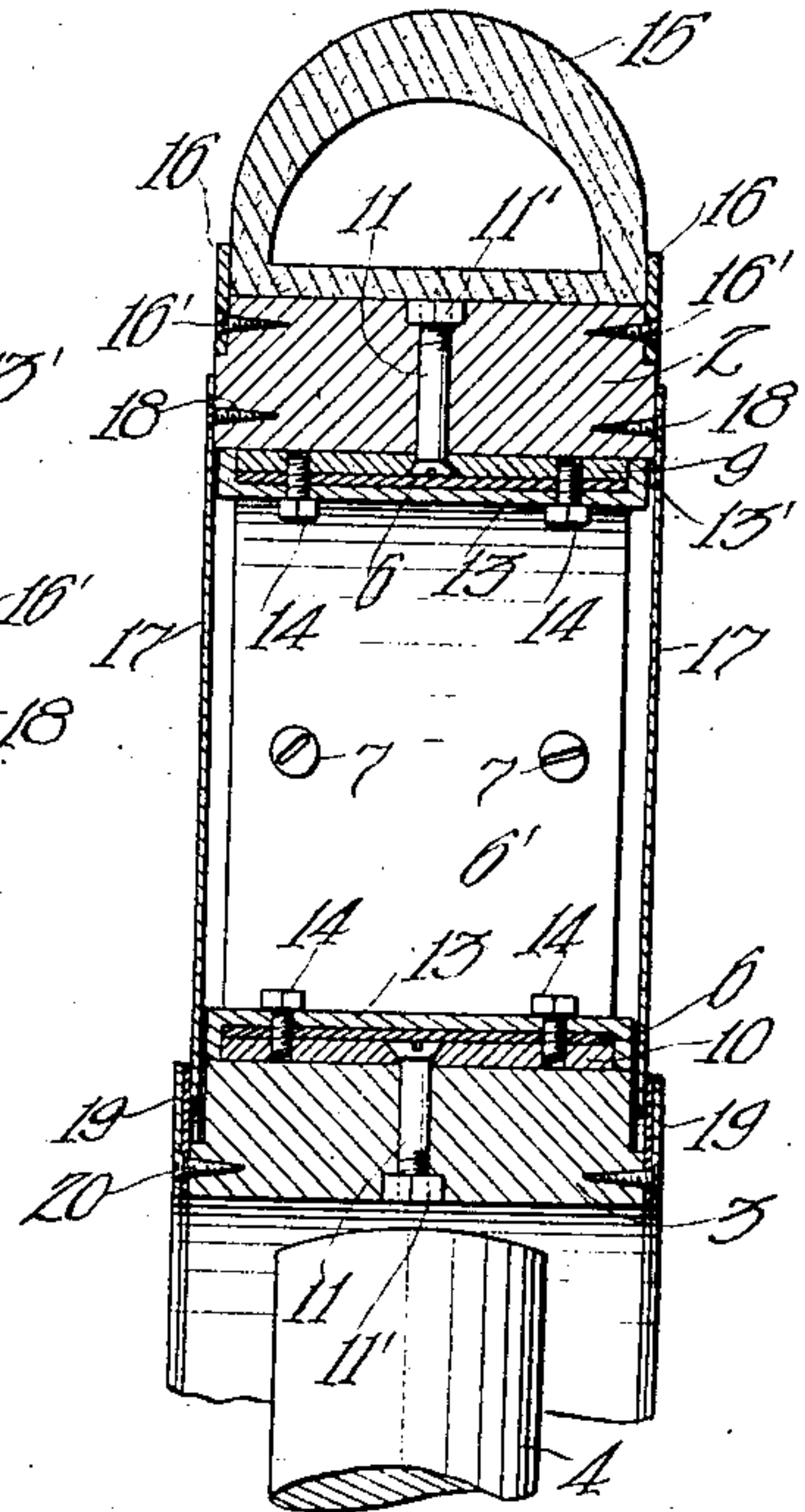


Fig. 3

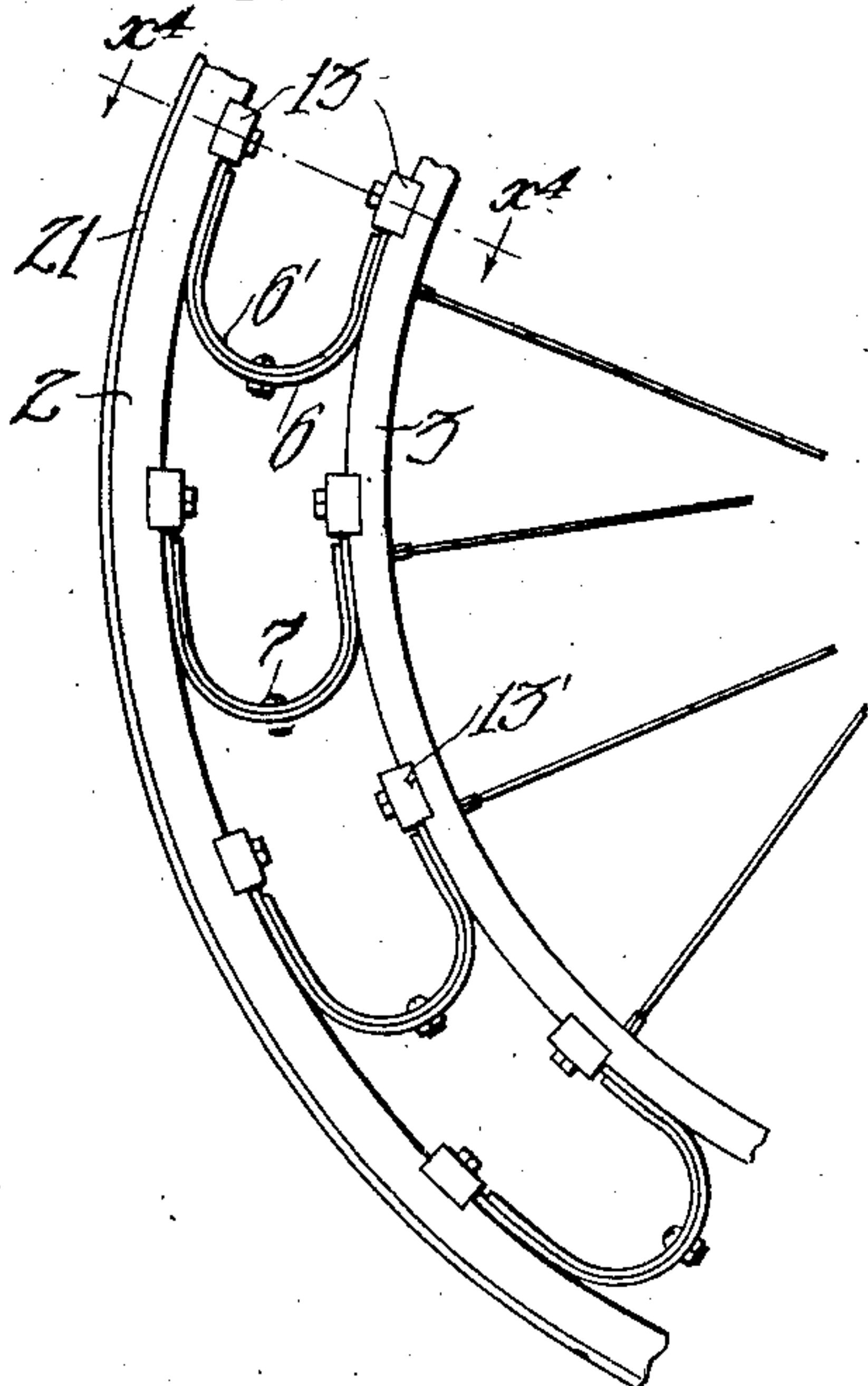


Fig. 4

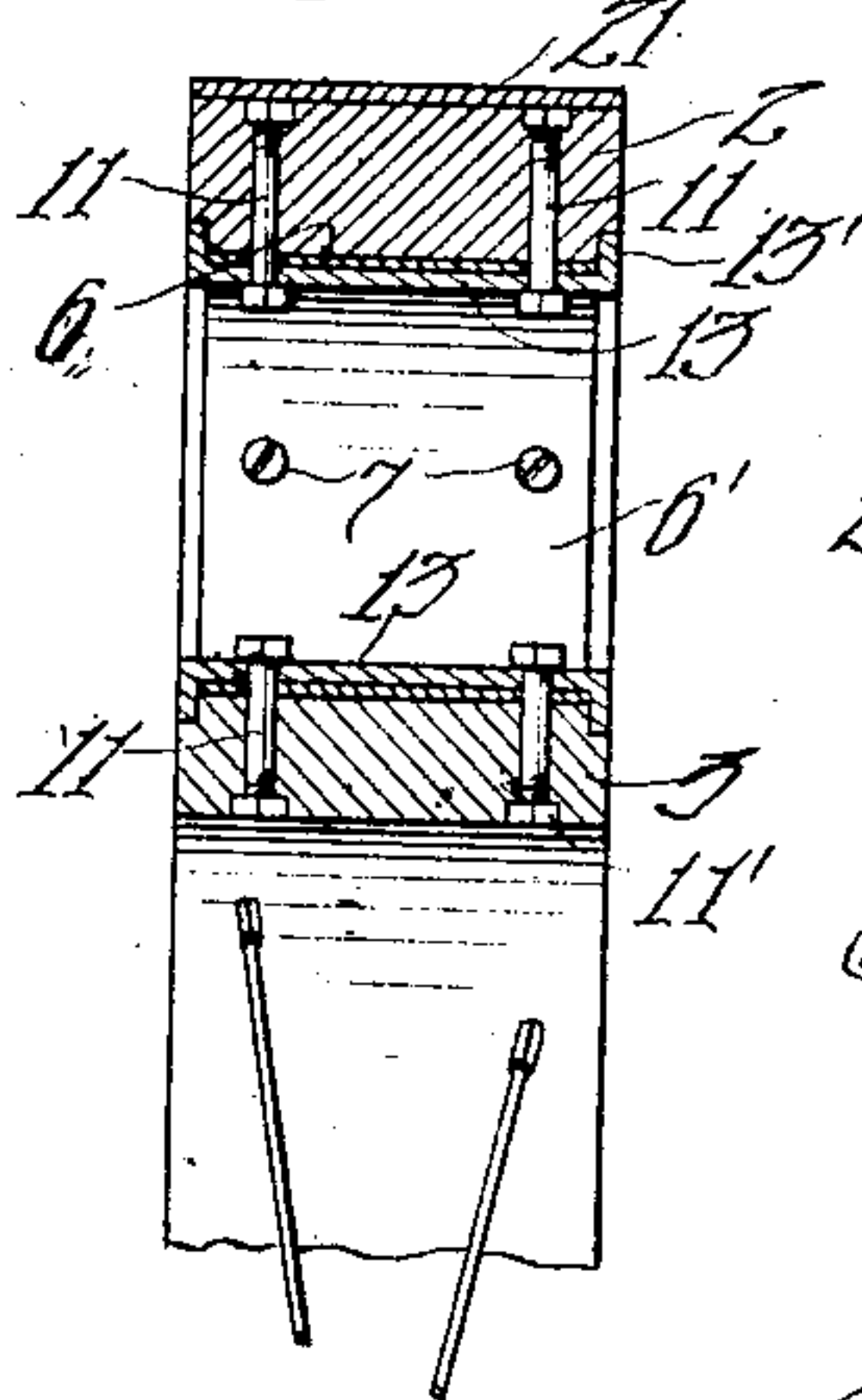


Fig. 5

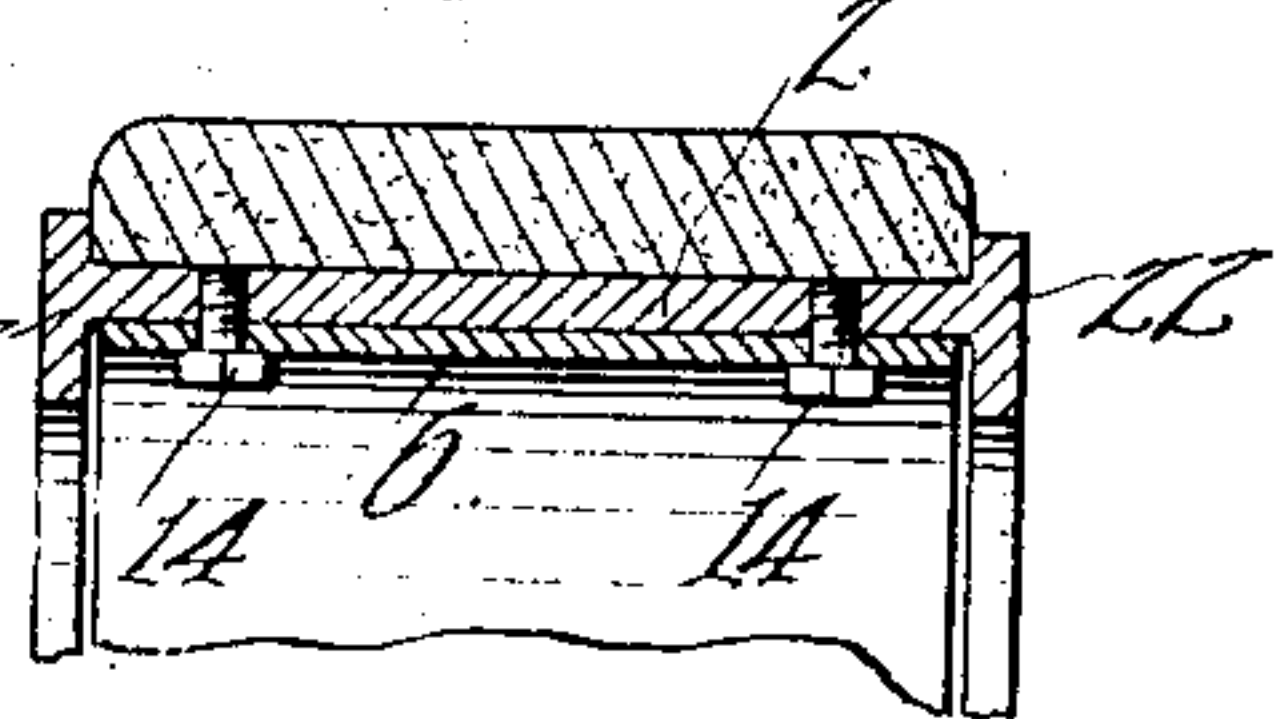
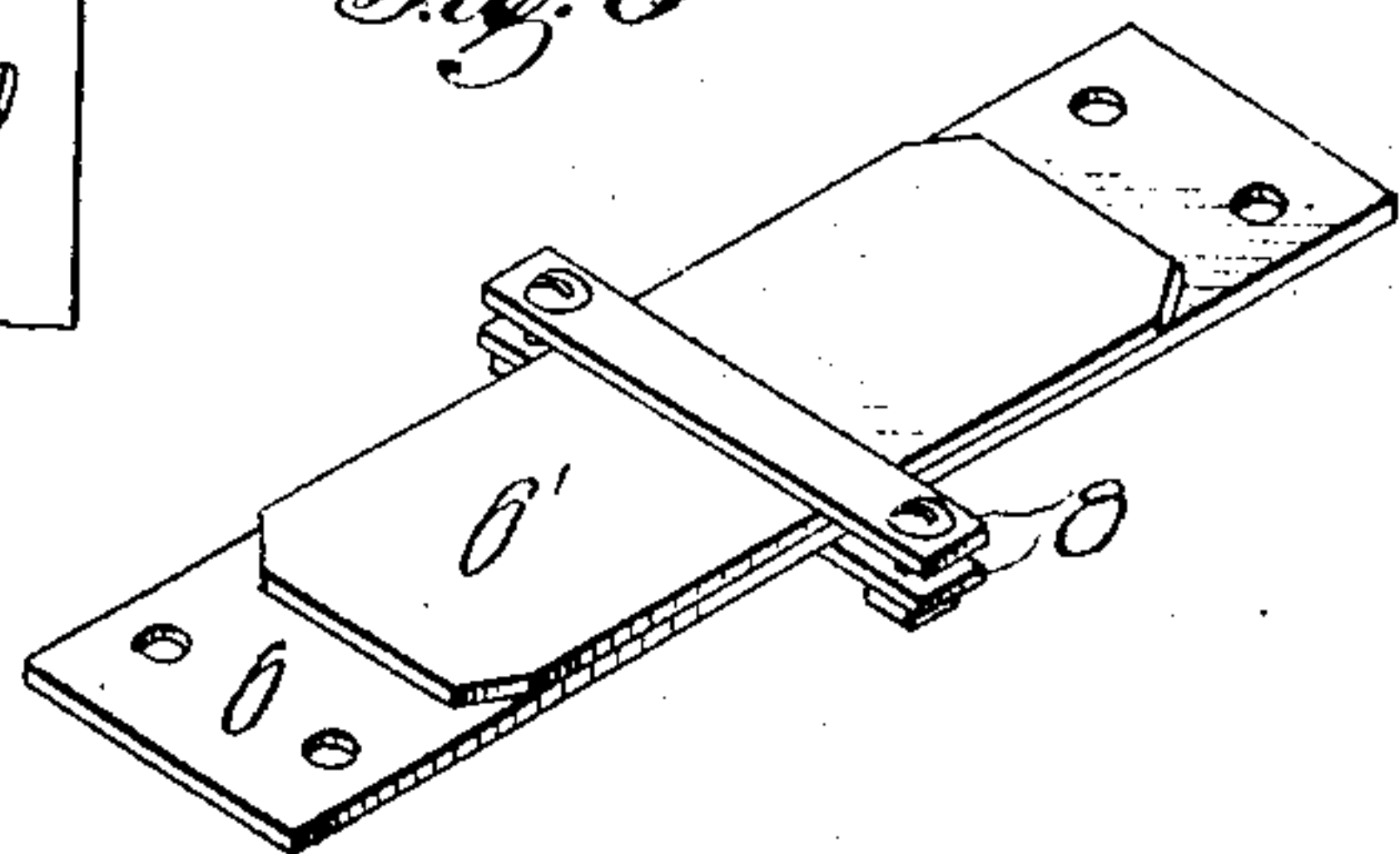


Fig. 6



Witnesses

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UNITED STATES PATENT OFFICE.

GEORGE H. WILLIAMS, OF LOS ANGELES, CALIFORNIA.

VEHICLE-WHEEL.

No. 814,580.

Specification of Letters Patent

Patented March 6, 1906.

Application filed August 31, 1905. Serial No. 276,489.

To all whom it may concern:

Be it known that I, GEORGE H. WILLIAMS, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Vehicle-Wheel, of which the following is a specification.

This invention relates to a vehicle-wheel which will yield elastically to jar or vibrate in a vertical plane, the wheel comprising inner or hub members and an outer or tire member, and elastic connecting or supporting means between said members.

The main object of the invention is to provide for elastic support for the inner member within the outer member in such manner that at no point of the circumference will there be an excessive resistance to the desired relative movement of the members. Connections which have hitherto been proposed for this purpose are generally defective in that while they provide a yielding support at the bottom and top of the yielding members they are relatively rigid at the sides of the wheels, so that the yielding effect at the top and bottom is negated by the rigidity at the sides. My invention provides elastic connections between the inner and outer members which will yield not only at the top and bottom parts of the wheel, but also at the sides, so that the resistance to relative vertical movements is substantially equalized through the circumference of the wheel being practically the same at the sides as the top and bottom. This not only gives a more effective cushioning action, but equalizes the strain on the inner and outer members.

A further object of the invention is to provide for a limited amount of rotary or transverse movement of the inner and outer members, thereby easing up the strain in starting and stopping.

Another object of the invention is to effectually brace the wheel members against movement transverse to the plane of the wheel.

Another object of the invention is to provide for protection of the yielding parts of the wheel from dust and dirt.

The accompanying drawings illustrate the invention.

Figure 1 is a side elevation of the wheel particularly adapted for automobiles with part of the side casing removed. Fig. 2 is a section on line $x^2 x^2$ in Fig. 1. Fig. 3 is a side view of the wheel suitable for bicycles or

light wheels. Fig. 4 is a section on line $x^4 x^4$ in Fig. 3. Fig. 5 is a transverse section of a different form of wheel-rim. Fig. 6 is a detail perspective of one of the springs for elastically connecting the wheel members, showing the same in extended or unbent position and showing a different fastening means for the members thereof from that shown in Figs. 1 to 4.

The wheel comprises an inner or hub member 1 and an outer or tire member 2, the inner member being furnished with a rim 3, attached by spokes 4 to hub 5, and the outer member consisting of a rim which is connected to the inner member by yielding elastic connections 6. Said elastic means consist of leaf or plate springs formed of strips of the steel or suitable elastic material (see Fig. 6) bent to U shape, one end of each of said springs being attached to the inner rim 3 and the other end to the outer rim 2. Said springs are preferably bent or sprung into shape against the action of their own resilience; so that they tend to resume an extended or straight condition, thereby increasing the elastic effect in supporting the inner members.

Each spring device 6 may have one or more reinforcing or inner U-shaped spring or springs 6' bent within it to brace or strengthen it. In Figs. 1 to 4 the inner spring is shown as fastened to the spring 6 by screws 7; but in case it is desired to avoid weakening of the spring metal due to the screw-holes a clamp may be provided consisting of two strips 8, (see Fig. 6,) embracing the springs 6 6' between them and clamping them firmly together.

Referring now to Figs. 1 and 2, showing an automobile-wheel, the outer and inner rims 2 3 are assumed to be of wood, being, for example, laminated wood of well-known construction. Rings 9 10 are secured, respectively, within rim 2 and on the periphery of rim 3 by screws or bolts 11 passing through to the opposite face of the rim and fastened by nuts 11' thereat. These rings 9 10 form metal bearings for the cushioning-springs 6, whose ends rest tangentially on said rings and are secured thereto by clamp-plates or bars 13, fastened by screws 14 extending through the springs and into rings 9 10, said clamps or bars having turned-over ends 13' to engage the edges of the spring 6 and rings 9 10 to lock or hold the parts firmly against lateral movement. Each spring thus com-

prises inner and outer members, the outer spring member being bent in U form with the ends thereof lying flat against the inner and outer wheel members and fastened at their extremities to said wheel members, and the inner spring member being fastened within the outer spring member at the bend thereof and having its ends extending within and against the outer spring member, but terminating short of the fastened portions at the ends thereof. This construction gives a maximum of flexibility and at the same time great strength, as the extended contact of the inner and outer spring members with one another and with the inner and outer wheel members gives a great weight-supporting capacity without interfering with the flexibility. The fastening of the spring at the extremities thereof to the inner and outer wheel members is also important, since if the springs projected beyond the fastening parts there would be a much stronger resistance to bending of the spring.

15 designates a pneumatic or cushion tire secured on an outer rim 2 by side strips or plates 16, fastened by screws 16'.

Wall-plates or casing-pieces 17 may be provided at the sides of the wheel, said plates being fastened by screws 18 to rim 2 and sliding alongside the rim 3 within guard plates or rings 19, fastened on rim 3 by screws 20. This construction prevents access of dust or dirt to the spring parts.

The pneumatic cushion 15 may be omitted, for example, in applying the invention to a lighter wheel, such as a bicycle-wheel, (see Figs. 3 and 4,) and in that case the outer rim 2 may have a metal tire 21 to take the wear of traction, sufficient elasticity being given by the spring-supports 6.

Instead of wooden rims with metal reinforcements whole metal rims may be used, the outer rim 2, for example, being made of

T-iron or I-beam, as shown in Fig. 5, its end flanges 22 serving on the inner side to confine or brace the springs 6 and on the outer side to form a seat for the tire, which in this figure is shown as a solid-cushion tire.

When the wheel is in use as a traction-wheel and power is applied to its hub to propel it in a forward movement, the spring members 6 are bent upon themselves, thus allowing of a certain amount of forward movement of the inner member of the wheel before the outer member or periphery of the wheel moves. This is specially advantageous in case of automobiles on account of the attending jerk of the engines when changing from a low gear to a higher gear.

What I claim is—

1. A vehicle-wheel comprising outer and inner rims, U-shaped springs between said rims, and clamps fastening the respective ends of the springs to the respective rims and having end portions engaging at the sides of the rims to prevent lateral movement.

2. A vehicle-wheel comprising inner and outer members, springs between said members, each spring having an outer member bent in U form with the end portions lying flat against the inner and outer wheel members and fastened at their extremities to said members, and an inner spring member extending and fastened in the bend of the outer spring member and extending freely within and against the flat portions of the outer spring member, but terminating short of the fastenings thereof.

In testimony whereof I have hereunto set my hand, at Los Angeles, California, this 24th day of August, 1905.

GEORGE H. WILLIAMS.

In presence of—

F. M. TOWNSEND,
VERNA A. TALBERT.