(No Model.)

R. C. SMITH.

GEAR WHEEL.

No. 458,984. Patented Sept. 1, 1891.

Fig. 1.

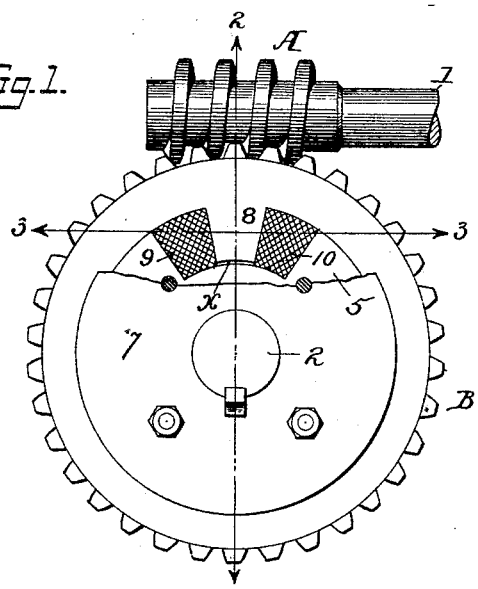


Fig. 2.

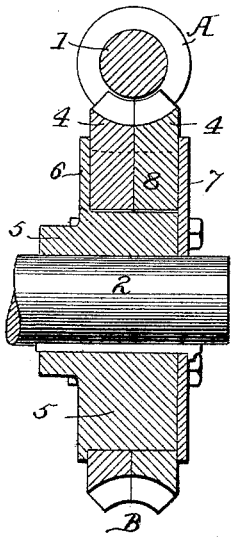


Fig. 3.

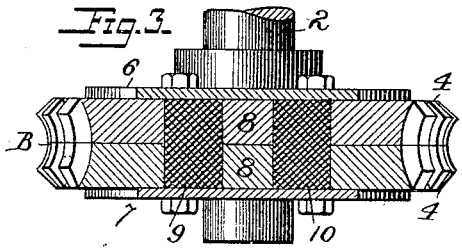


Fig. 6.

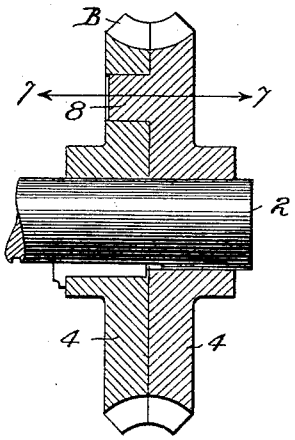


Fig. 4.

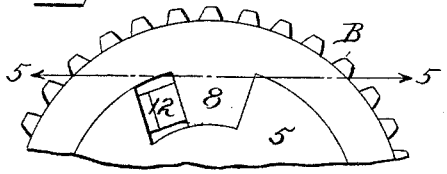


Fig. 5.

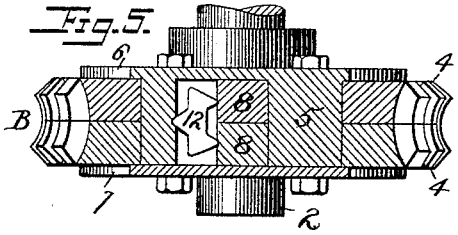
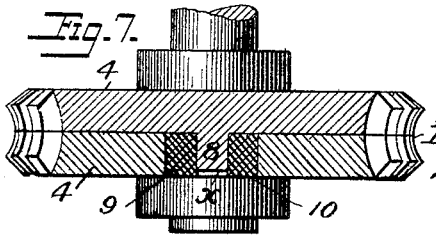


Fig. 7.



WITNESSES

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GEAR-WHEEL.

SPECIFICATION forming part of Letters Patent No. 458,984, dated September 1, 1891.

Application filed November 20, 1890. Serial No. 372,043. (No model.)

To all whom it may concern:

Be it known that I, RUDOLPH C. SMITH, a citizen of the United States, residing at Yonkers, Westchester county, State of New York, have invented certain new and useful Improvements in Gear-Wheels, of which the following is a specification.

As is well known, the use of worm-gears is frequently attended with objections incident to imperfect fitting of the gears, as unequal wear, undue friction, abrasion, and heating. I have found that by forming the worm-wheel in sections capable of slight independent adjustment and by affording yielding bearings for the sections any inequality or want of coincidence in the bearing-surfaces is compensated for, while other advantages are attained, and I therefore construct the gear as fully set forth hereinafter, and as illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation in part section of a worm-wheel and worm embodying my improvements. Fig. 2 is a section on the line 2 2, Fig. 1. Fig. 3 is a section on the line 3 3, Fig. 1. Fig. 4 is an elevation illustrating a modification, and Fig. 5 is a section on the line 5 5, Fig. 4; Fig. 6, a section illustrating another modification; Fig. 7, a section on the line 7 7, Fig. 6.

The worm A is formed upon the worm-shaft 1, and the latter is mounted upon suitable bearings in the usual manner, while the worm-wheel B is mounted upon a shaft 2 at right angles to the shaft 1. The worm-wheel B, instead of consisting of a single piece, as usual, consists of two or more sections 4 4, each being circular, the sections lying side by side in a plane at right angles to the shaft 2 and the teeth being cut across the edges of the different sections in the same manner, as usual. The hub of the wheel may be formed in one piece with one of the sections, or it may be sectional, one section of the hub being connected with one section of the wheel; or, as shown, the hub 5 may be independent of all the sections, which are confined between a flange 6, formed in one piece with the hub, and a detachable flange 7, bolted to one face of the hub, the latter being keyed to the shaft 2. One or all of the sections 4 may have yielding bearing upon the hub or shaft. As illustrated, there are two sections 4 4, each of which has a projection 8 extending into a recess *x* in the hub between two elastic blocks 9 10, so that each section is capable of a slight rotation upon the hub in each direction, limited by the extent to which the elastic blocks may be compressed. With the gears thus constructed each section of the worm-wheel will have its proper bearing upon the worm independently of the other section, so that the wear cannot come disproportionately upon any one portion of the surface of the teeth, while the yielding bearings of the sections reduce shocks and strains in starting the apparatus in motion. The yielding bearings of the sections are not necessarily elastic. Thus, as shown in Fig. 4, the two sections may have their bearings each upon one end of an equalizing-lever 12, the fulcrum of which has its bearing upon the hub or body 3. This permits the sections to yield slightly independently of each other and of the hub, while the rim, as a whole, has a positive bearing upon the hub.

By constructing the gear as above described I secure a uniform bearing for the thread of the worm and a uniform wear of the surfaces, whereby the surface pressure is lessened, friction reduced, and abrasion and heating avoided, and these results are attained with practically no increase in the expense of making the gear.

Without limiting myself to the precise construction and arrangement of parts shown, I claim—

1. The combination, with a worm and its shaft, of a worm-wheel composed of circular sections lying side by side with teeth cut angularly across the faces of the sections and yielding bearings between one or more of the sections and the shaft upon which the wheel is mounted, substantially as described.

2. The combination, with a worm and its shaft, of a worm-wheel composed of a hub and circular sections independently mounted upon said hub and yielding bearings between the hub and the sections, substantially as set forth.

3. A worm-wheel consisting of a central hub and peripheral ring-sections, the hub having a recess receiving projections upon the pe-

ripheral sections, and a yielding bearing between said projections and the face of the hub, substantially as set forth.

4. The combination, in a worm-wheel, of a hub and sections mounted independently upon the hub and an equalizing-lever having a bearing on the hub and on each section, substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses

RUDOLPH C. SMITH.

Witnesses:
EDW. K. ANDERTON,
LOUIS F. GOLDMANN.