

(No Model.)

W. N. WHITELEY.
GEAR WHEEL.

No. 415,755.

Patented Nov. 26, 1889.

Fig. 1.

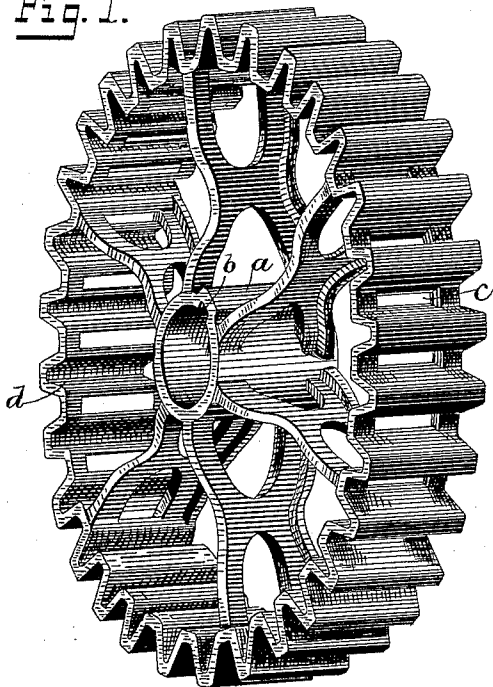


Fig. 2.

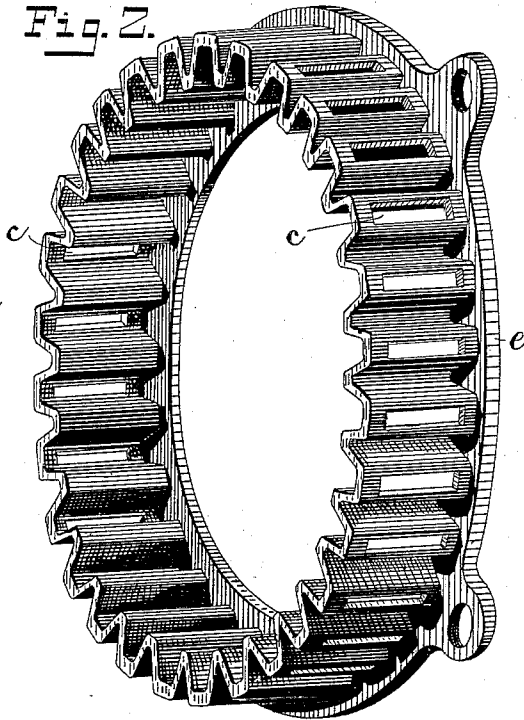
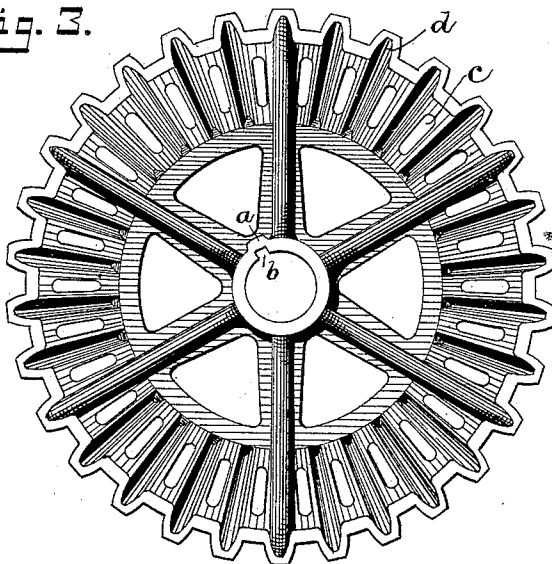


Fig. 3.



Witnesses:

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Inventor:

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UNITED STATES PATENT OFFICE.

WILLIAM N. WHITELEY, OF SPRINGFIELD, OHIO.

GEAR-WHEEL.

SPECIFICATION forming part of Letters Patent No. 415,755, dated November 26, 1889.

Application filed September 24, 1886. Serial No. 214,429. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM N. WHITELEY, a citizen of the United States, residing at Springfield, in the county of Clark and State of Ohio, have invented certain new and useful Improvements in Cast Malleable-Iron Gear Wheels and Pinions; and I hereby declare the following to be such a full, clear, and exact description thereof as will enable any person skilled in the art to construct the same, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates generally to the construction of gear wheels and pinions, particularly when the same are made of cast malleable iron; and its objects are, first, to construct gear-wheels, pinions, sprocket-wheels, &c., of such form as to be capable of being thoroughly and properly annealed, and at the same time to possess the requisite rigidity and strength; and, second, to provide suitable openings through the rim between the teeth, through which dirt, straw, grass, or other clogging matter may pass freely out when coming in contact with the teeth of the opposite wheel or pinion.

My invention is in the nature of an improvement upon the present form of such gear-wheels, pinions, and sprocket-wheels, and is hereinafter fully described, and fully illustrated in the drawings hereunto annexed.

Heretofore one of the objections to casting gears of malleable iron has been that certain parts were of much greater thickness than others, and were therefore not capable of being thoroughly annealed; second, malleable iron being of much greater density than ordinary "grey iron" a casting made of it shrinks much more in cooling, and therefore demands greater care in the even distribution of metal and in the form of the pattern, in order to insure a casting of proper form and free from distortion; third, in gears of even a moderately-wide face, when used in agricultural machinery, mills, and many other situations where they were subjected to the presence of dirt, grass, straw, or other like material, have caused much trouble from clogging by such matter wedging itself between the teeth, which greatly impeded their free operation

and efficiency and often rendered them entirely inoperative.

In my improved form of constructing gears the first objection is met by so forming the pattern that a uniform thickness of metal is secured in all parts of the casting, by which they may be uniformly and thoroughly annealed. The second objection—that of distortion—is obviated by the peculiar form of the rim and teeth, whereby they form, as it were, a continuous band of corrugated iron, the corrugations serving to form the teeth. The third objection—that of clogging—is overcome by forming through the rim suitable openings through which any dirt, straw, or other clogging matter may pass, thus relieving the teeth from these obstructions.

In the drawings, Figure 1 is a perspective view of a spur gear-wheel constructed after my improved form. Fig. 2 is a similar view of an internal gear for attaching to the arms of a larger wheel. Fig. 3 is an elevation.

Similar letters refer to like parts in the several views.

Referring to the drawings, my form of construction is as follows, viz: The hub is formed of an equal thickness of metal on all sides, including the keyway *b*, a projecting ridge *a* being formed for that purpose. The arms may be divided as shown in Fig. 1 in cases where a wide face is required, or made in a T-shaped section, as in Fig. 3, care being taken to have an equal thickness of metal in all parts. Through the rim are openings *c c*, made between the teeth, through which all dirt, straw, grass, or other clogging matter may freely pass when coming in contact with the teeth of an opposite wheel or pinion. The teeth are each recessed at the back, as shown at *d d*, thus giving them somewhat of a U-shaped section, and forming of the teeth and rim a continuous corrugated band of metal, the corrugations providing amply for the great amount of shrinking always occurring in the rim of a cast-wheel, and particularly so when cast of malleable iron.

Internal gear-wheels or rims to attach to the arms of a larger wheel—as, for instance, a mowing-machine wheel—are constructed, as shown in Fig. 2, with a web *e* at the ends of the teeth, or, for affording a better opportu-

nity for contraction in cooling, the web may be omitted. Openings *c c* are the same as for an external or spur gear. Spur-pinions may be formed with a double series of openings *c* 5 *c*, one series on each side of the central web or flange, or said flange may be at one end of the teeth, and only one series of openings double the length may be substituted, substantially as shown in Fig. 2, such flange, 10 however, being formed with the usual central hub and bearing, and not having the peripheral rim shown in said figure.

Having thus described my invention and

pointed out wherein my improvement differs from the usual practice, what I claim as new, 15 and desire to secure by Letters Patent, is—

A cast-metal gear wheel or pinion having a continuous corrugated rim of uniform thickness perforated between those portions which constitute the teeth, substantially as shown 20 and described.

WILLIAM N. WHITELEY.

Witnesses:

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