(No Model.) 2 Sheets—Sheet 1.

H. BITNER.

HORSE POWER.

No. 495,009. Patented Apr. 11, 1893.

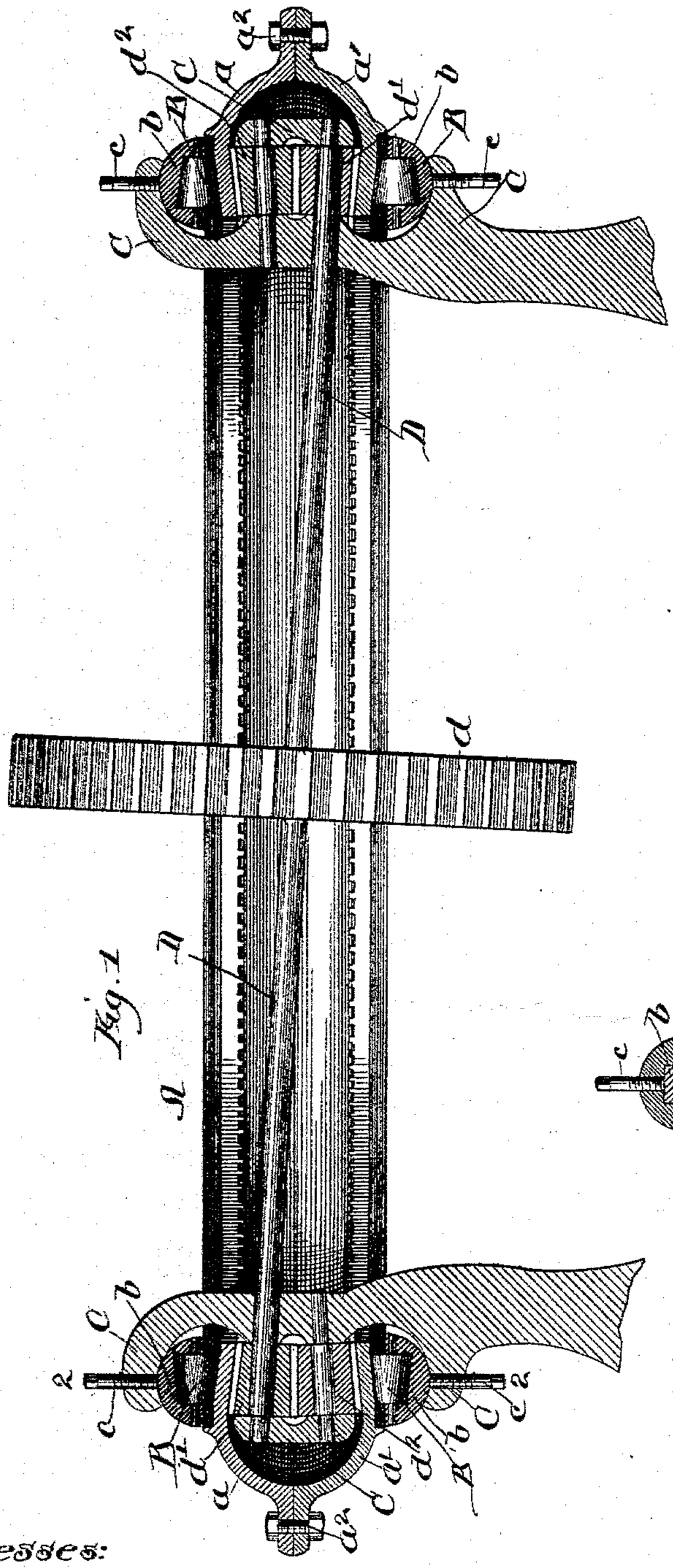

Fig. 1.

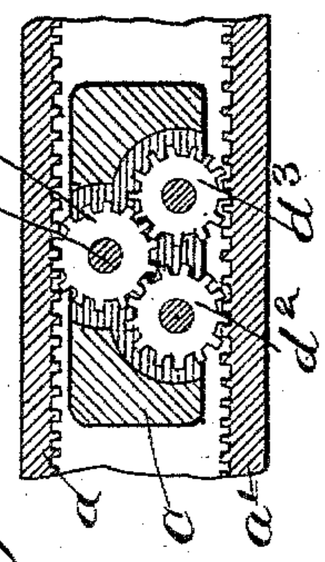

Fig. 3.

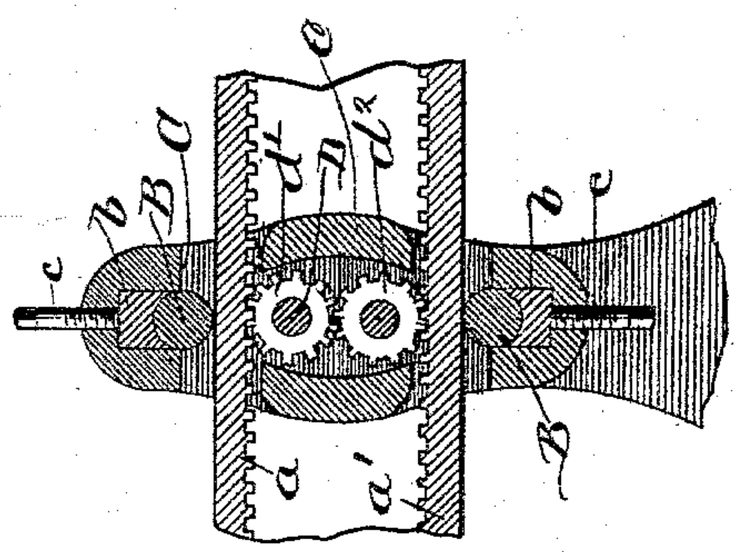

Fig. 2.

Witnesses:

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Gerald Mahony

Inventor:

Harry Bitner.

(No Model.) 2 Sheets—Sheet 2.

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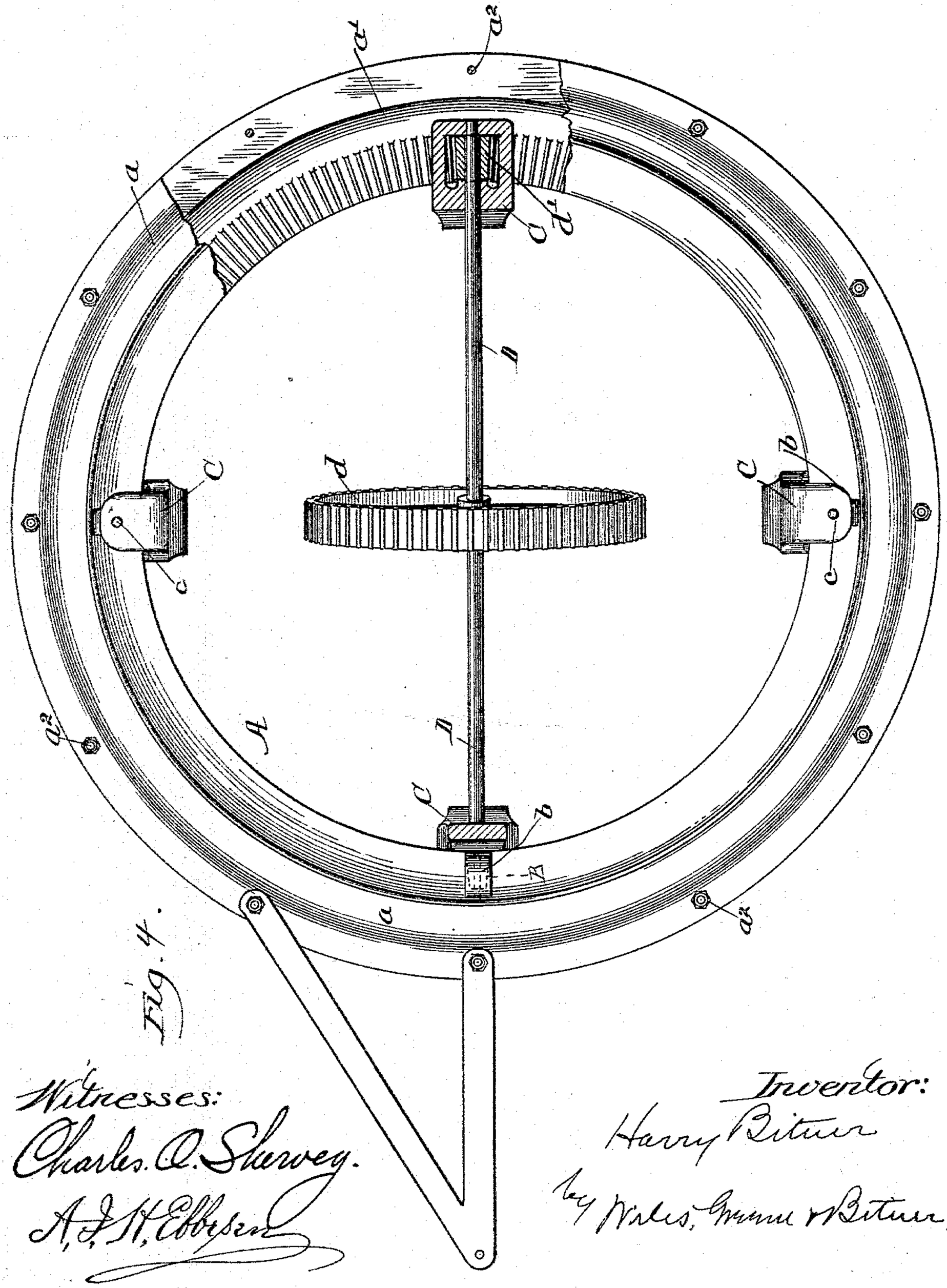

Witnesses:
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UNITED STATES PATENT OFFICE.

HARRY BITNER, OF CHICAGO, ILLINOIS, ASSIGNOR TO ANDREW WICKEY AND EDWARD W. WICKEY, OF SAME PLACE.

HORSE-POWER.

SPECIFICATION forming part of Letters Patent No. 495,009, dated April 11, 1893.

Application filed July 2, 1892. Serial No. 438,743. (No model.)

To all whom it may concern:

Be it known that I, HARRY BITNER, a citizen of the United States of America, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Horse-Powers, of which the following is a specification.

In the ordinary horse power, a large, horizontal master-wheel is commonly employed, meshing with a small pinion, connected either directly or indirectly to a tumbling rod, by means of which the power is transmitted to the driven machinery. To get the desired speed, it is necessary to use a comparatively small pinion, thereby causing a great strain upon the teeth or cogs, and frequently breaking some of them away. Various devices have been tried, to overcome this difficulty, and it is to this particular end that the improvements comprising my invention are directed. It is my intention to accomplish this object by means of an arrangement which, instead of throwing the entire strain upon a single tooth of the driving pinion and also of the master-wheel, shall divide the work among two or more teeth upon each wheel. I do this by constructing the master-wheel either U-shaped in cross section, or preferably in two pieces bolted together, so that it shall have two inner toothed surfaces facing each other, and by arranging two or more pinions between these toothed surfaces, each meshing with its respective gear and also with one of the pinions in mesh with the opposite gear. The power is taken from a single pinion, but, as such pinion receives it not only from one side of the master-wheel, but also from one or more pinions meshing with the other side, the strain is divided up between two or more cogs upon the driving pinion, arranged at different points about its periphery.

Referring to the drawings for an illustration of my invention, Figure 1 is a central vertical section of the master-wheel, showing the driving shaft and gear thereon in full lines. Fig. 2 is a cross section in line 2—2 of Fig. 1. Fig. 3 is a similar section of a modification; and Fig. 4 is a broken plan view.

The master-wheel is lettered A, and is made up of two sections, a, a', secured together by means of bolts, a^2. The wheel rides upon rollers, B, journaled in blocks, b, held in recesses in frame, C. The rollers are adjusted toward or from each other by means of set screws, c. A driving shaft, D, is journaled in the frame, C, having upon its central portion a large gear, d, by means of which the shaft's rotation is transmitted to the work, and also carrying at its respective ends pinions, d', meshing one with the upper and one with the lower face of the master-wheel. As the two pinions are upon opposite sides of the wheel, this manner of gearing causes both pinions to turn the shaft in the same direction. Between each of the pinions, d', and the face of the master-wheel opposite to the one with which said pinion is in gear, is placed a loose pinion, d^2, meshing with the pinion, d', and the master-wheel. This pinion is journaled in the frame, C, so that it transmits the motion of the master-wheel to the driving pinion with which it meshes, while at the same time reversing said motion to correspond with the motion of the side of the pinion with which it is in gear. This, it will be seen, divides the strain upon the pinions, d', between the opposite sides thereof. Fig. 3 shows a slight change in the arrangement, which enables a third pinion to be used, and gains still greater strength because of the further division of the strain upon the gear wheel, d'.

The principal advantages of the above described construction are its simplicity, compactness and strength. The master wheel furnishes a cover for the pinions meshing with it making a neat construction. The increased strength is due to the division of the strain between the two faces of the master wheel and the two sides of the driving pinions. Thus looking at Fig. 2, the driving pinion, d', meshes on one side with one face of the master wheel, and on the other side with the loose pinion, d^2, which, in turn, meshes with the other side of the master wheel. The driving pinion, d', is subject to strain upon its upper side from the master wheel itself and upon its lower side from the loose pinion, d^2, which, in turn, is driven by the lower face of the master wheel. The strain which would otherwise be borne by a single tooth of the driving pinion and a

tooth of the master wheel meshing therewith, is therefore divided between two opposite teeth of the driving pinion, and also between the opposite faces of the master wheel. This division is carried still further in Fig. 3, where two loose pinions, d^2, d^3, mesh with different portions of the lower face of the master wheel and with different portions of the driving pinion, d', bringing three teeth of the driving pinion and three teeth of the master wheel always into position to divide the strain.

I claim as new and desire to secure by Letters Patent—

1. The combination with a master-wheel having two toothed surfaces facing each other, of a pinion fast upon a driving shaft, suitably journaled, and meshing with one of said surfaces, and a second pinion also suitably journaled and meshing with the first pinion and also with the opposite teeth of the master-wheel; substantially as described.

2. The combination of a frame, C, having pinions, d', d^2, and rollers, B, journaled therein, and a master-wheel, A, having inside toothed faces meshing with said pinions respectively and riding between said rollers; substantially as described.

3. The combination with a frame, C, two pinions, d', d^2, journaled thereupon, a master-wheel, A, having two inside toothed surfaces meshing with said pinions respectively, and adjustable rollers, B, adapted to retain said master-wheel in place; substantially as described.

4. The combination with a frame, C, having pinions, d', d^2, journaled thereupon, and a master-wheel, A, meshing with said pinions and composed of the two sections, a, a', suitably secured together; substantially as described.

5. The combination of a frame, C, a driving shaft suitably journaled in said frame, a master-wheel carried thereby, and three pinions, all geared to the same end of the driving shaft and all meshing with the master-wheel; substantially as described.

HARRY BITNER.

Witnesses:
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