

No. 620,480.

Patented Feb. 28, 1899

W. H. MONK.
WHEEL GEARING.

(Application filed Nov. 21, 1898.)

(No Model.)

FIG. 1.

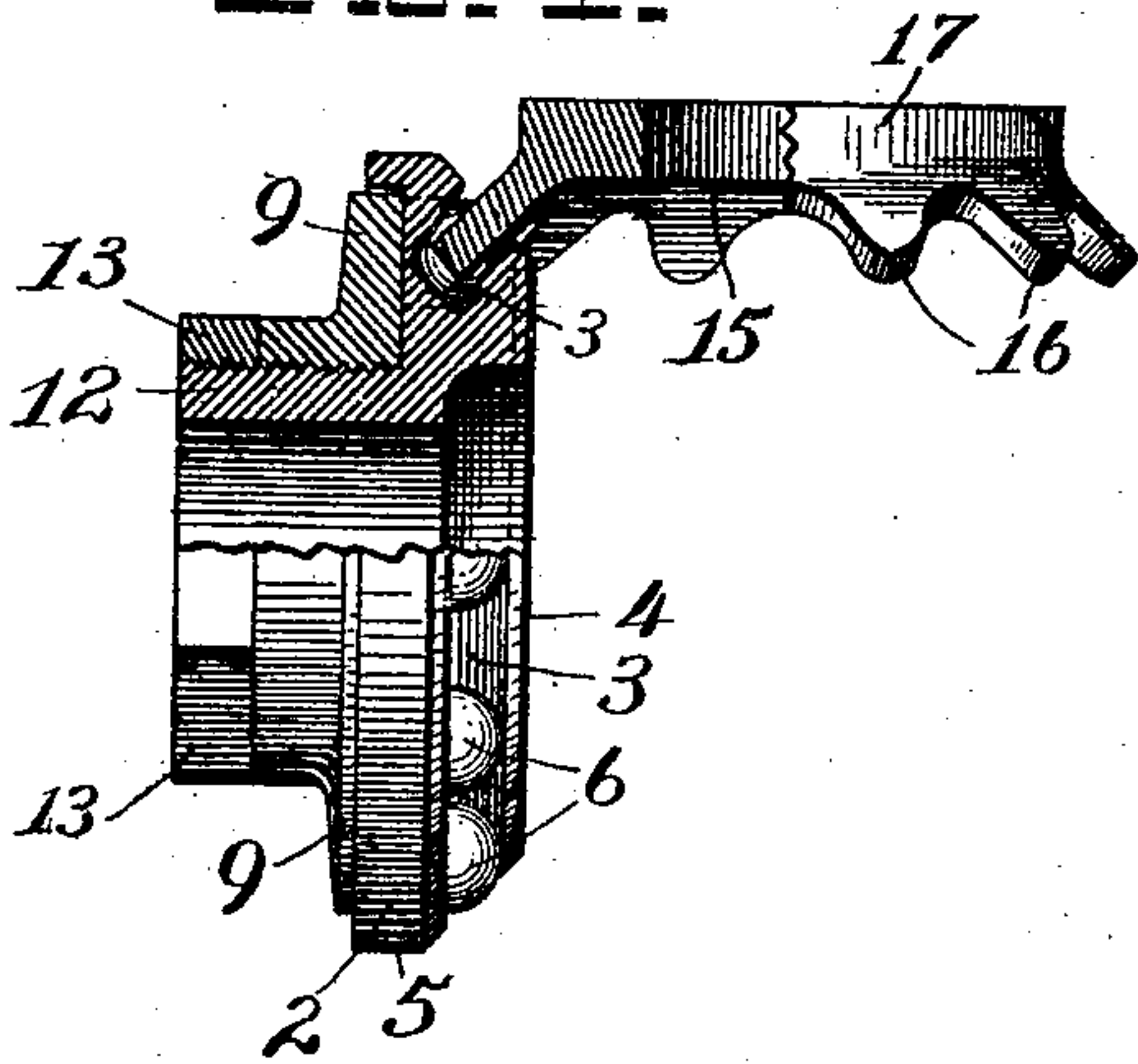


FIG. 2.

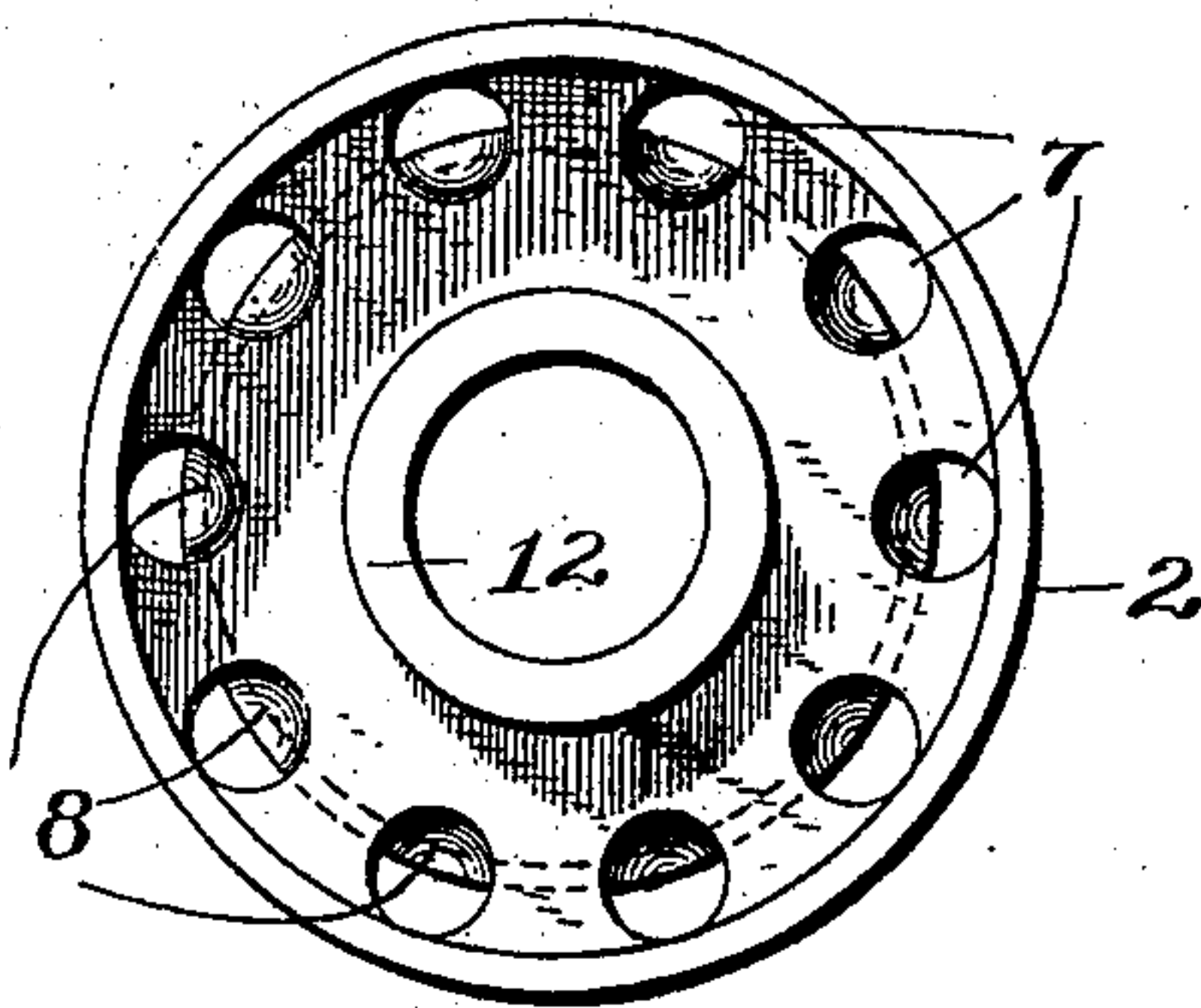


FIG. 3.

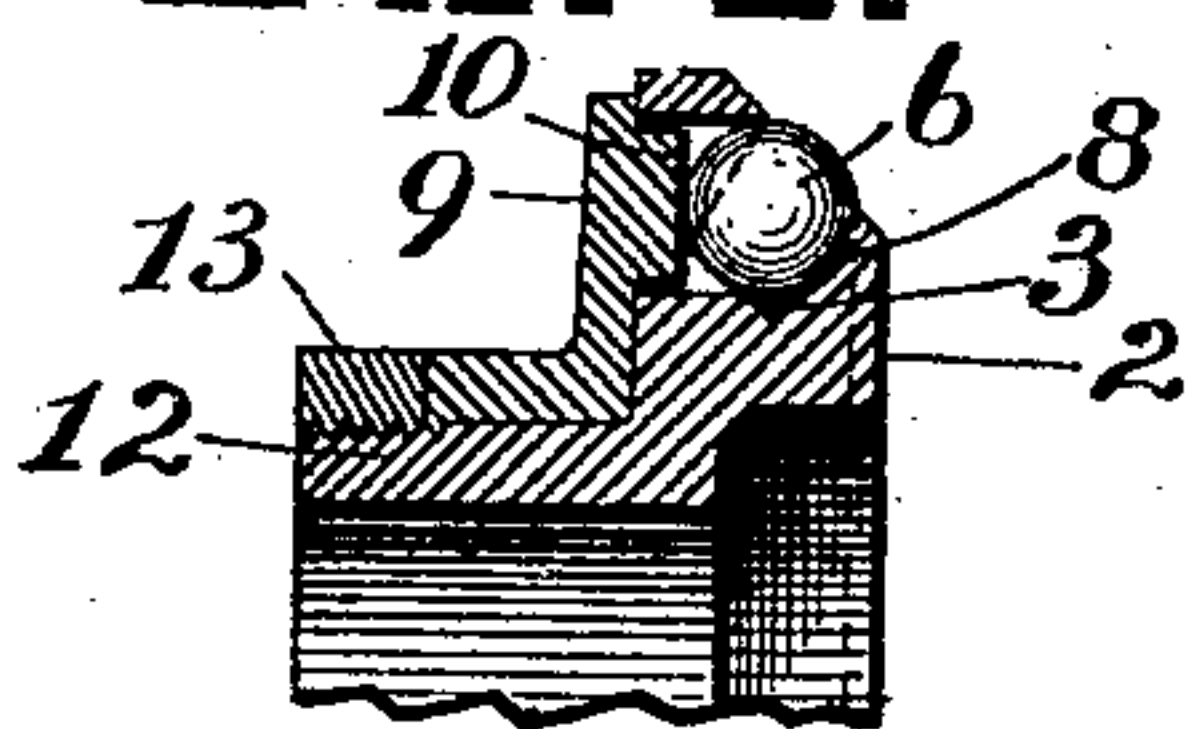


FIG. 4.

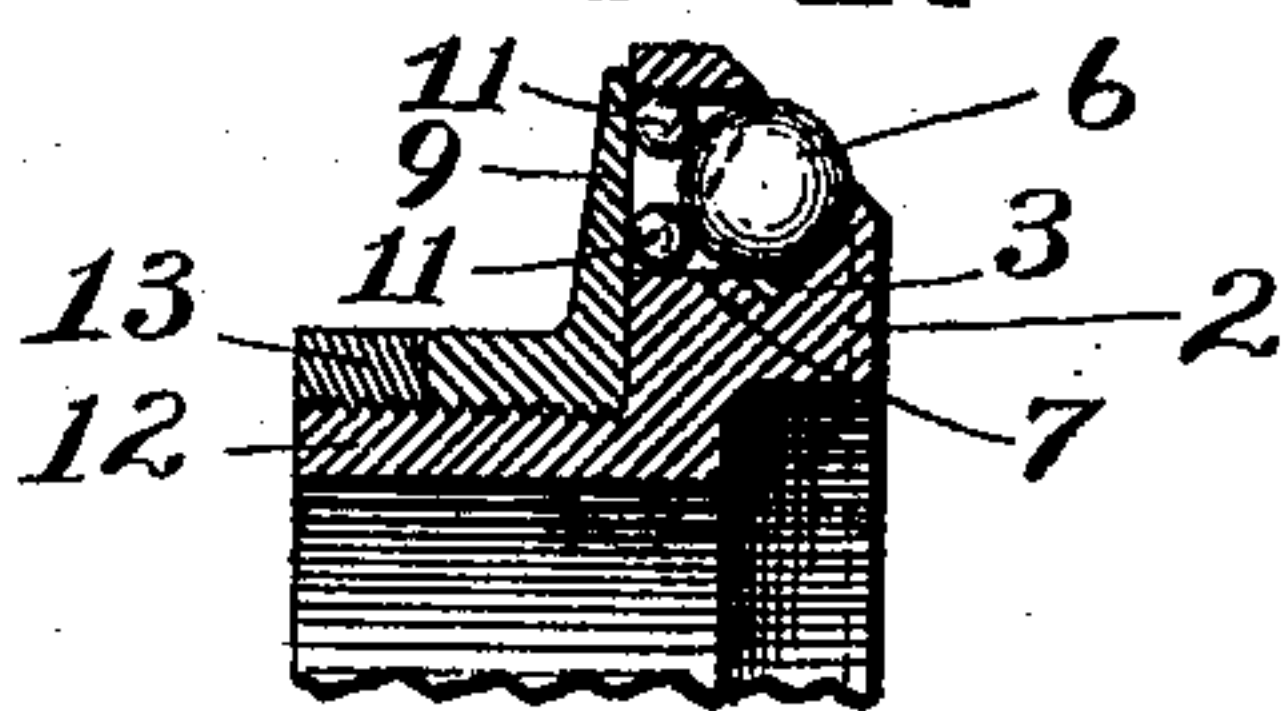


FIG. 5.

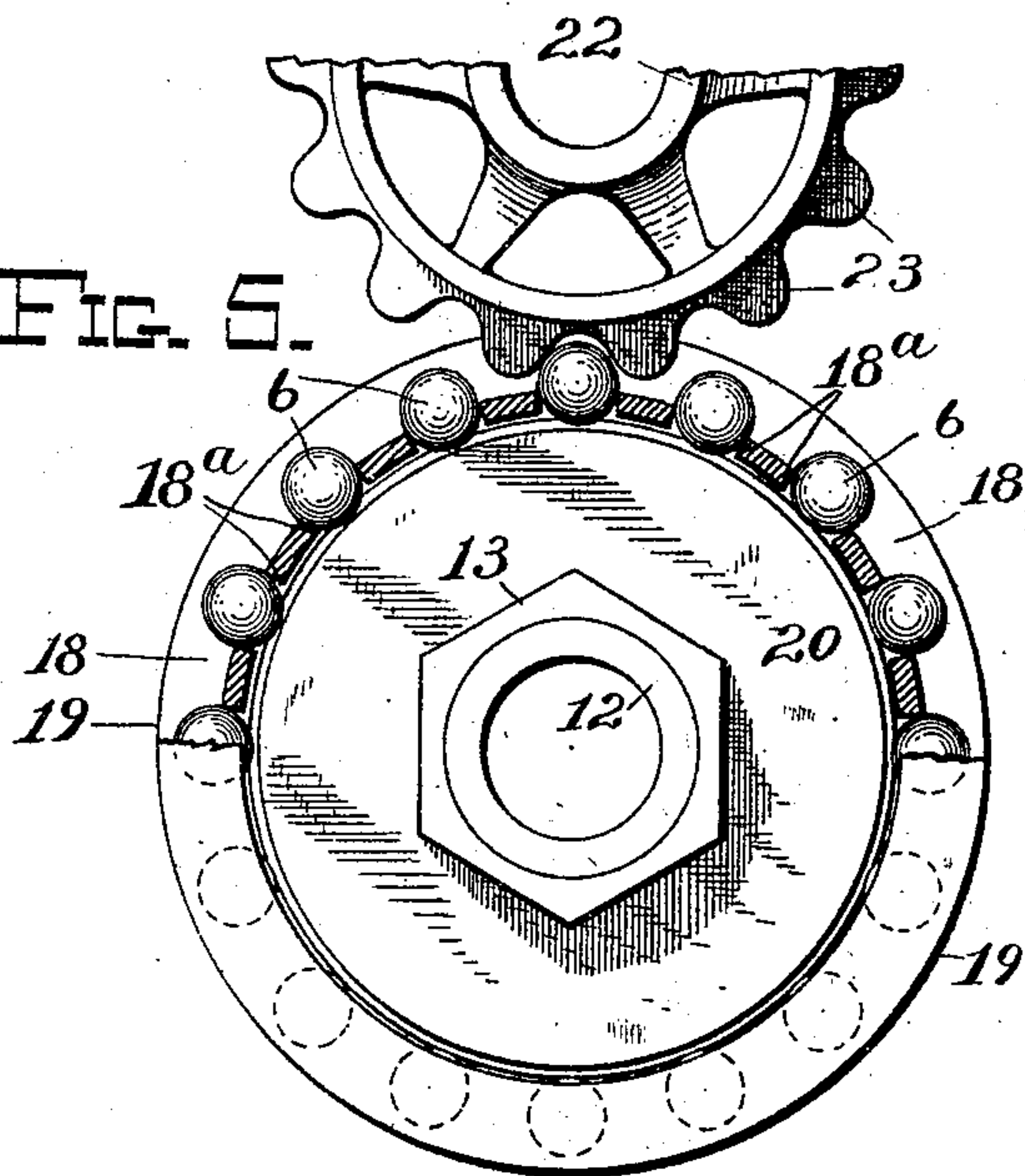
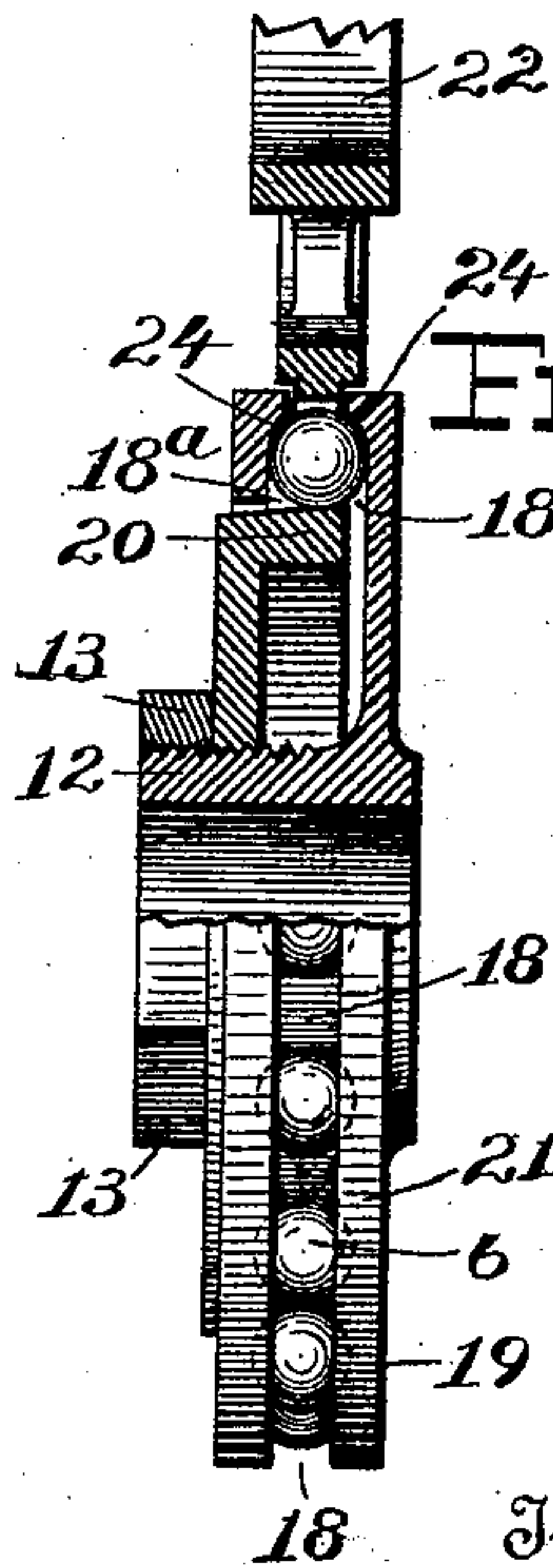


FIG. 6.



Witnesses
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UNITED STATES PATENT OFFICE.

WILLIAM HENRY MONK, OF CHESTER, ENGLAND.

WHEEL-GEARING.

SPECIFICATION forming part of Letters Patent No. 620,480, dated February 28, 1899.

Application filed November 21, 1898. Serial No. 697,067. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM HENRY MONK, a subject of the Queen of Great Britain, residing at Chester, in the county of Chester, England, have invented an Improvement in Wheel-Gearing, of which the following is a specification.

My invention relates to improvements in wheel-gearing, especially wheel-gearing in which one wheel is set at, say, a right angle to the wheel with which it gears, though it may also be applied to a wheel adapted to gear with another wheel in or approximately in the same plane as itself.

My invention has for its objects to facilitate and cheapen manufacture and to reduce friction.

The manner in which I attain my objects is hereinafter described, reference being had to the accompanying drawings, wherein—

Figure 1 is an elevation, partly in section, of a gear constructed according to my invention gearing with a spur-wheel at right angles thereto. Fig. 2 is a rear elevation of the disk, showing the holes for the reception of the balls, the balls being removed. Fig. 3 is a central sectional view showing a modification of the device. Fig. 4 is a similar view of another modification. Fig. 5 is a side elevation of a pair of wheels arranged to gear in the same plane, the upper half of the lower wheel being shown in central section. Fig. 6 is an edge view, partly in section, of the same.

Similar numerals refer to the same parts throughout the drawings.

In carrying out my invention as applied to a gear-wheel adapted to gear with another wheel situated in a plane at, say, right angles thereto, as shown in Figs. 1 to 4 of the accompanying drawings, I take a circular metal disk 2 and turn a concentric groove 3 in the face 4 thereof at a suitable distance from the periphery 5 and at an angle of forty-five degrees to the said face. The width of this groove is somewhat less than the diameter of certain balls 6, hereinafter referred to. From the back of the disk 2 I drill a circular series of equidistant holes 7, which open out into the groove 3. The holes 7 are preferably slightly larger in diameter than the balls 6, which they are adapted to receive. The balls

project by preferably considerably more than half their diameters beyond the bottom of the groove 3, but are prevented from falling out forward by stopping the drilling of the holes short of the face 4 of the disk. The bottom portions 8 of the holes are preferably rounded.

The balls 6 constitute the teeth of the wheel, and to retain them in their forward position a plate 9 is located behind the disk. This plate may either bear directly on the balls, as shown in Fig. 1, or it may be provided with a circular series of studs 10, adapted to enter the holes 7 and bear against the balls 6, as shown in Fig. 3, or other balls 11 may be introduced between the backs of the balls 6 and the face of the said plate 9, as shown in Fig. 4.

The back of the disk 2 may be provided with a screw-threaded boss 12, along which the plate 9 screws, (except when provided with the studs 10, when it slides,) and a nut 13, screwing on behind the said plate, provides adjustment and retains the parts in position, or adjustment may be provided by other suitable means. The spur-teeth 16 of the wheel 17 are set at forty-five degrees to the face 15 of the said wheel and are thin enough to leave and enter the groove 3 in the disk 2. The said teeth 16 enter between and engage with the ball-teeth 6 of my improved wheel, and motion may thus be transmitted from one wheel to the other with a minimum of friction.

In constructing according to my invention a wheel 21, adapted to gear with a spur-wheel 22 in the same or nearly the same plane, as shown in Figs. 5 and 6, I form the groove 18, corresponding to the groove 3 in Figs. 1 to 4, in the periphery of the disk and parallel to the faces thereof. The holes 18^a, corresponding to the holes 7, are drilled radially and are formed with rounded shoulders 24 where they open into the groove 18. The balls in this case are preferably held up to their work and adjusted by a conical-edged plate 20, adapted to move laterally relatively to the disk by screwing along the boss 12, the adjustment being locked by the nut 13, screwing along the said boss 12 and bearing against the back of the plate 20. The spur-teeth 23

are parallel to the faces of the wheel 22. If desired, the balls 6 may in either case be adjusted so tight as to form fixed teeth.

What I claim, and desire to secure by Letters Patent, is—

1. In wheel-gearing, the combination with a disk having a peripheral groove, and holes opening into the said groove, and a hub or boss on the said disk, of balls in the said holes, a plate fitting around the said hub to retain the balls in place, and means for securing the said plate upon the said hub, substantially as described.

2. In wheel-gearing, the combination with a disk having a peripheral groove, and holes opening into the said groove, and a hub on the said disk; of balls in the said holes, a

plate fitting upon the said hub and against the said disk for retaining the said balls in the holes, and a nut screwed upon the said hub to hold the said plate in position, substantially as described.

3. In wheel-gearing, the combination with a disk having a peripheral groove and holes opening into the said groove, and a hub or boss on the said disk, of balls in the said holes, a plate screwed upon the said hub and having a conical edge to support the said balls and a nut also screwed upon the said hub to hold the said plate, substantially as described.

WILLIAM HENRY MONK.

Witnesses:

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AUSTIN GREGORY.