

(No Model.)

F. H. RICHARDS.

GEARING.

No. 390,097.

Patented Sept. 25, 1888.

Fig. 1.

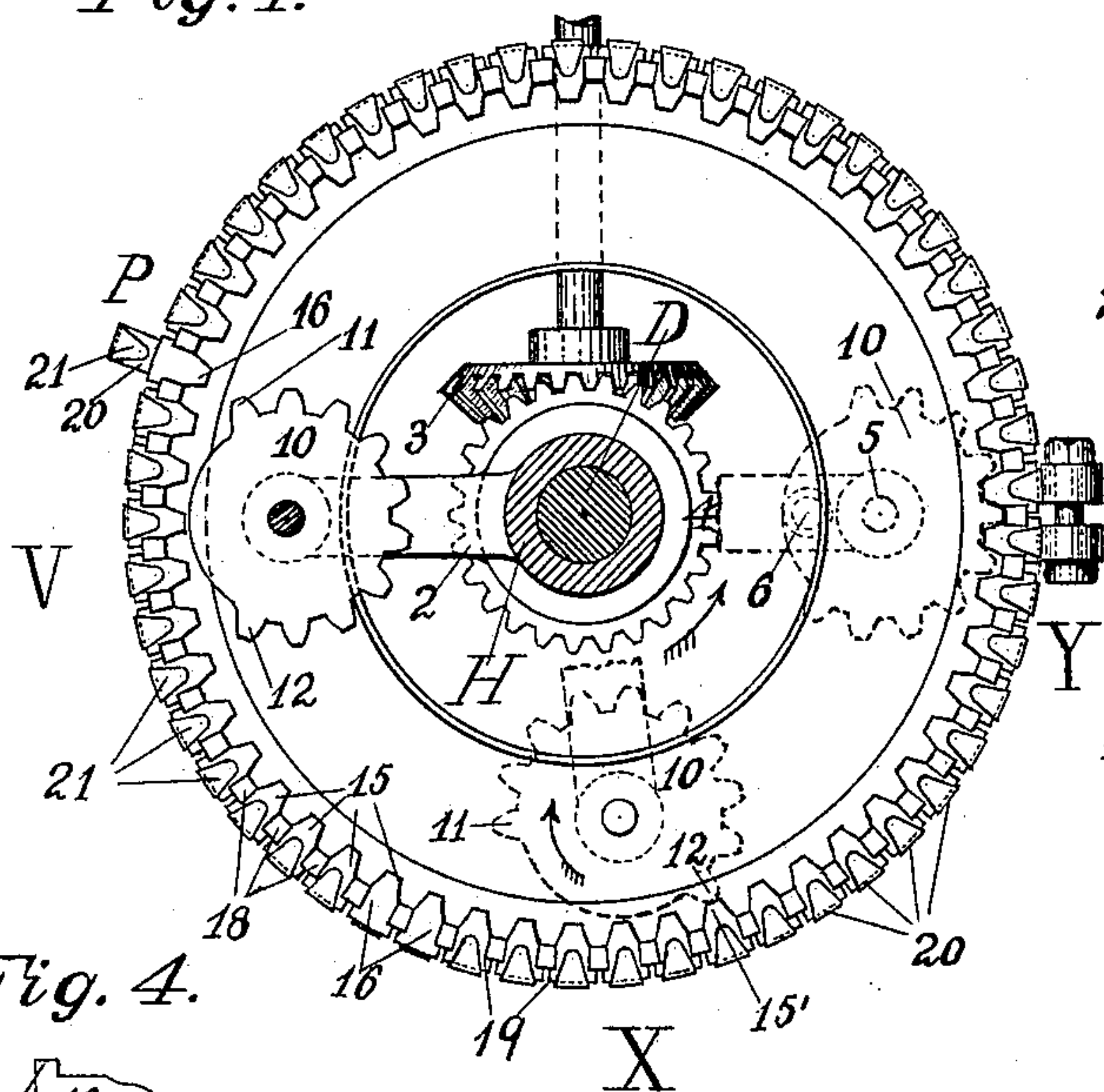


Fig. 3.

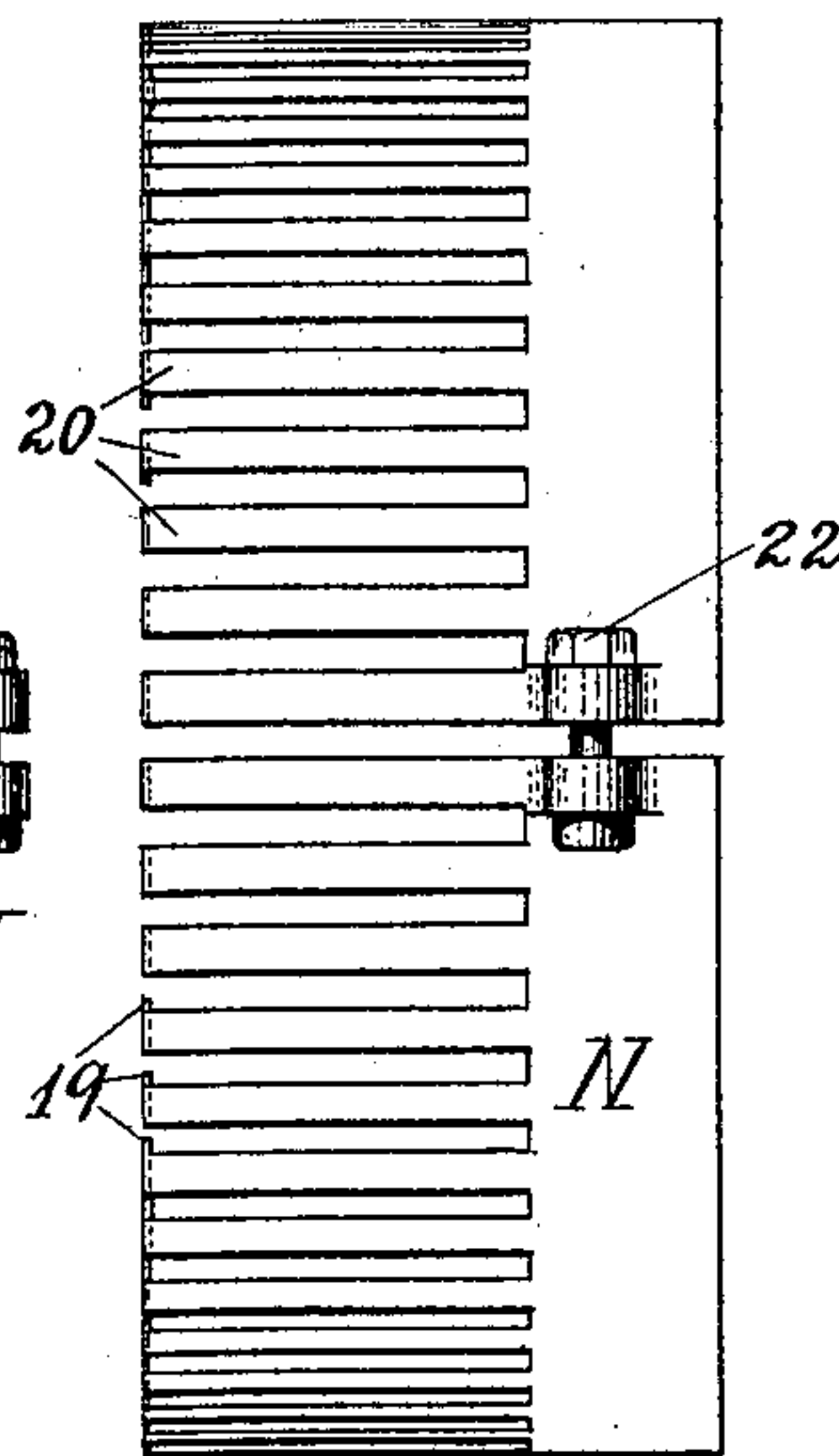


Fig. 4.

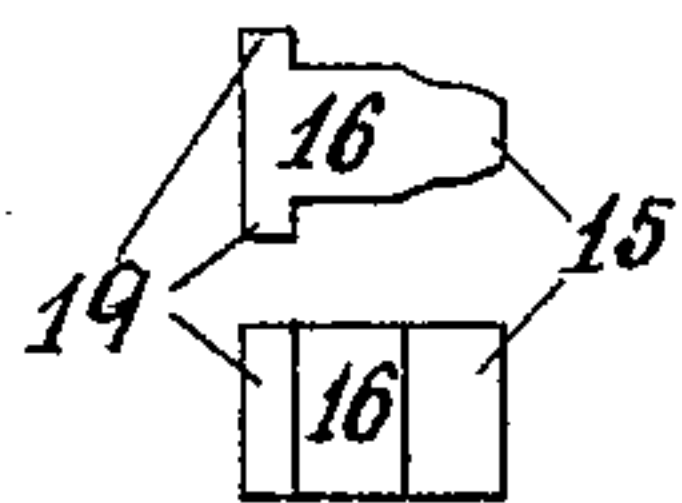


Fig. 2.

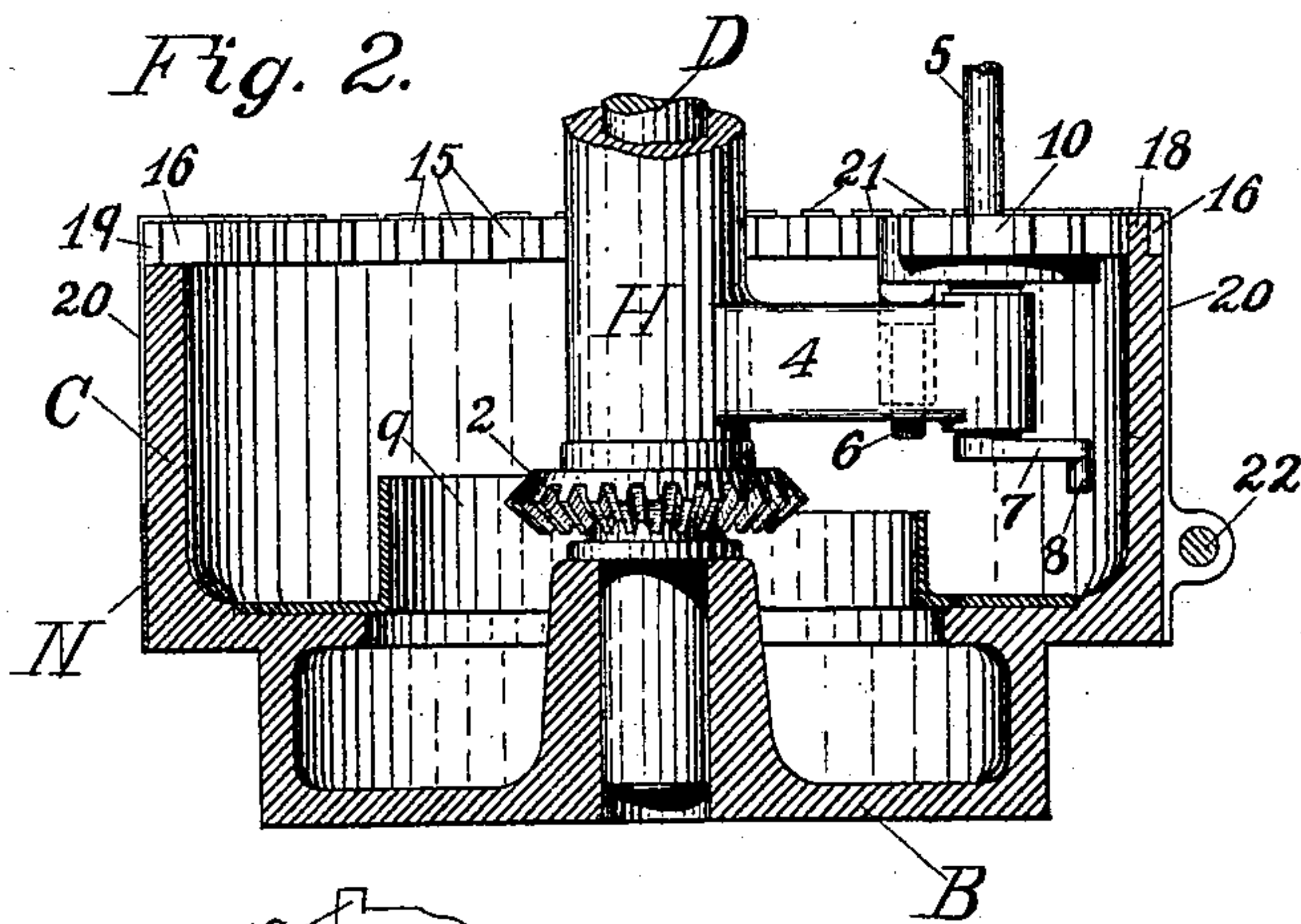


Fig. 5.

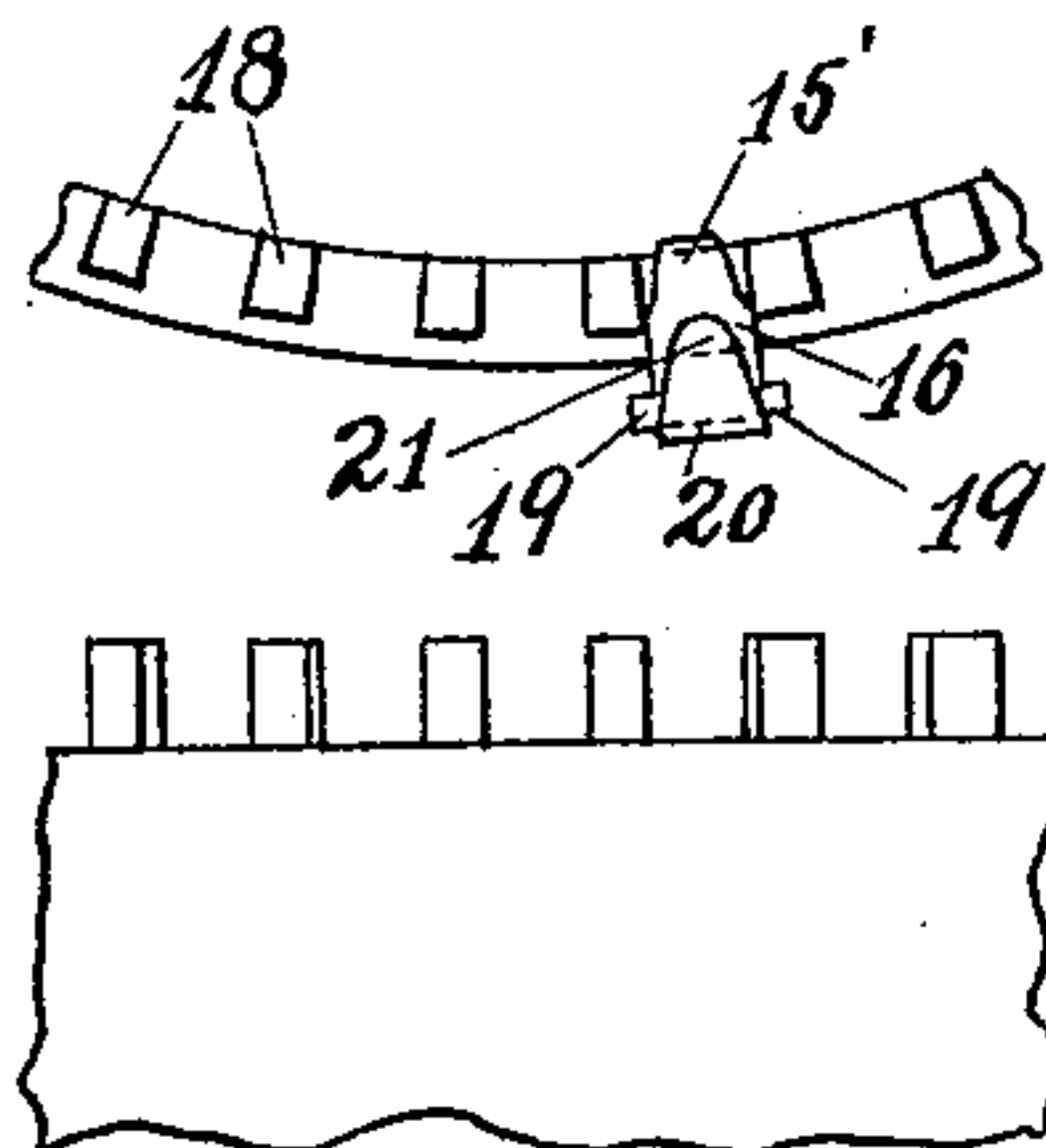
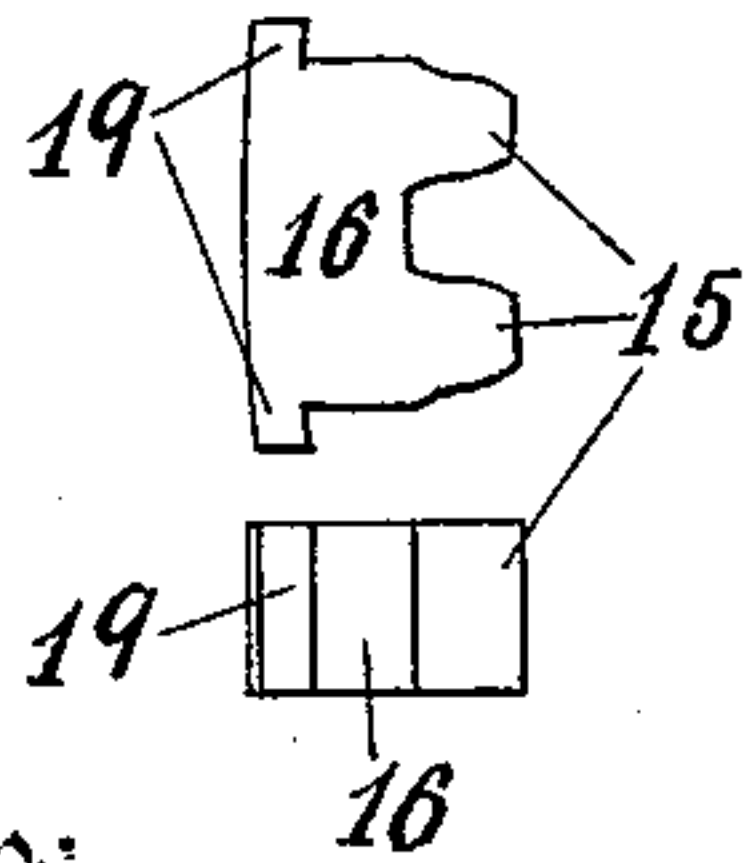


Fig. 6.



Witnesses:

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Inventor:

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# UNITED STATES PATENT OFFICE.

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## GEARING.

SPECIFICATION forming part of Letters Patent No. 390,097, dated September 25, 1888.

Application filed November 15, 1886. Renewed March 7, 1888. Serial No. 266,484. (No model.)

*To all whom it may concern:*

Be it known that I, FRANCIS H. RICHARDS, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Safety - Gearing, of which the following is a specification.

This invention relates to gearing adapted to be used with safety in a certain class of mechanical movements in which a segmental gear having a continuous orbital movement is intermittently revolved on its own axis.

The object of the invention is to secure safety from breakage in case the segmental gear be improperly operated in the starting of it, as hereinafter more fully set forth.

In the drawings accompanying and forming a part of this specification, Figure 1 is a plan view of gearing embodying my improvements. Fig. 2 is a vertical sectional elevation of the same. Fig. 3 is a side elevation of one form of spring used for yieldingly holding in place the movable gear-teeth. Fig. 4 shows enlarged top and side views, respectively, of the removable tooth in its preferred form. Fig. 5 shows two similar views of a portion of the notched rim by which said teeth are held in place. Fig. 6 is a view similar to Fig. 4, showing two teeth formed on a single block.

Similar characters designate like parts in all the figures.

For the better understanding of my improvements, the system of gearing is shown in the drawings in connection with a part of the frame-work and some of the mechanism of a mechanical movement of the class above mentioned.

The frame-work comprises a base-plate, B, side wall, C, of a circular form, and fixed stud D. The mechanism comprises the revolving frame H, turning freely on said stud, gearing 2 and 3 for driving said frame, the revoluble shaft 5, carried in arm 4 of frame H, the segmental gear 10, fixed on said shaft, for continuing the rotation thereof after the same shall have been started by other means, (not shown,) a detent-pin, 6, operating in connection with a notch in gear 10 to detain said shaft in proper position while the same is at rest, and a stop-arm, 7, fixed on the shaft and having a stop-

pin, 8, for striking against the segmental stop-rim 9 to bring said shaft to rest. These parts are all described and their operation explained in the joint application of D. W. Dodson and F. H. Richards for improvements in mechanical movements, Serial No. 219,327, filed of even date herewith.

In Fig. 1 the segmental gear 10 is shown in three successive positions, V, X, and Y. In the first position the side from which the teeth have been omitted stands outward, so that the terminal teeth 11 12 will clear the internal teeth, 15, as said gear 10 is carried around in its orbit by frame H. In the second position, X, the gear 10 is supposed to have been started revolving (in the direction of the arrow thereon) by means not shown, so that tooth 12 strikes against the end of tooth 15'. This result, due to the starting of gear 10 not in the right time, will naturally impede the proper operation of the mechanism. To avoid this effect I form the teeth 15 on movable blocks 16, which are held against stops by springs. These blocks are preferably held in place by and between stops 18 on wall C. They are held inward, with the ears 19 against said stops 18, by springs 20, fixed on the frame-work. For holding the blocks down in place said springs have their upper ends turned over to form hooks 21, which rest above the blocks and whose operation is obvious. By first drawing back the spring, as at P, Fig. 1, the block 16 may be lifted out for cleaning or renewal or for other purposes. In the third position, Y, Fig. 1, said gear 10 is shown in mesh with teeth 15 at about the middle of a revolution, and drawn in projection with the same gear in Fig. 2.

Springs 20 may be separate pieces; but I prefer to make them integral with a band, N, which reaches around wall C and is clamped thereon by clamp-bolt 22, or equivalent device. The toothed blocks being all in place, this band is slipped down until the spring-points 21 are on said blocks, when the band is firmly tightened.

The teeth 15 are not necessarily formed each on a separate block, although this arrangement is deemed preferable; but they may be formed two on one block, as shown in Fig. 6. Likewise the blocks need not be of a rectan-



gular cross-sectional form, but may be cylindrical and be arranged to slide in holes formed in wall C. These and similar but unessential modifications will be readily understood by mechanics familiar with this class of machinery.

The operation of the gearing may be readily understood from the drawings, taken in connection with the preceding description. When the mechanism is not in use, but is running idle, the gear 10 stands in respect of teeth 15 as at Y, Fig. 1. When gear 10 is properly started, revolving on its own axis, tooth 12 enters one of the spaces between teeth 15, and said gear continues to revolve thus properly in mesh, as at Y, same figure. If, however, as may often happen, said gear is not properly started, then tooth 12 will strike on a tooth 15, as on the tooth 15' at position X, and will drive back said tooth, as shown in Fig. 5. This relieves the strain and gives a chance for the gear to arrange itself in proper mesh and afterward to go on as at position Y. Sometimes, however, several teeth in succession will be thrown out before such rearrangement of the position of said gear will take place.

This gearing, in connection with a mechanical movement having (like that above specified) a segmental gear-wheel, is applicable to type-writers of that general class which includes the type-writer described in United States Patent No. 299,754, granted to D. W.

Dodson June 3, 1884—that is to say, to type-writers whose type-wheels have independent orbital and axial rotary movements.

Having thus described my invention, I claim—

1. The combination, in a system of gearing, of a segmental toothed gear having an orbital motion and a driving-gear having yielding teeth constructed to mesh with the teeth of said segmental gear, substantially as and for the purpose described.

2. The combination of a frame-work constructed to receive blocks 16, the blocks 16 having gear-teeth thereon and adapted to have a movement outward from fixed stops, and springs holding said blocks normally against said stops, all substantially as described.

3. The combination of a wall or frame-work having stops 18, toothed blocks fitting between said stops and having one or more ears, 19, and spring 20, having hooks 21, whereby said blocks are removably held in place, substantially as described.

4. The combination of the circular wall having the series of toothed blocks fitted thereto, and band N, having a series of springs corresponding to and holding in place said blocks, all substantially as described.

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Witnesses:

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