

(No Model.)

G. F. EVANS.
FRICTIONAL GEARING.

No. 453,630.

Patented June 9, 1891.

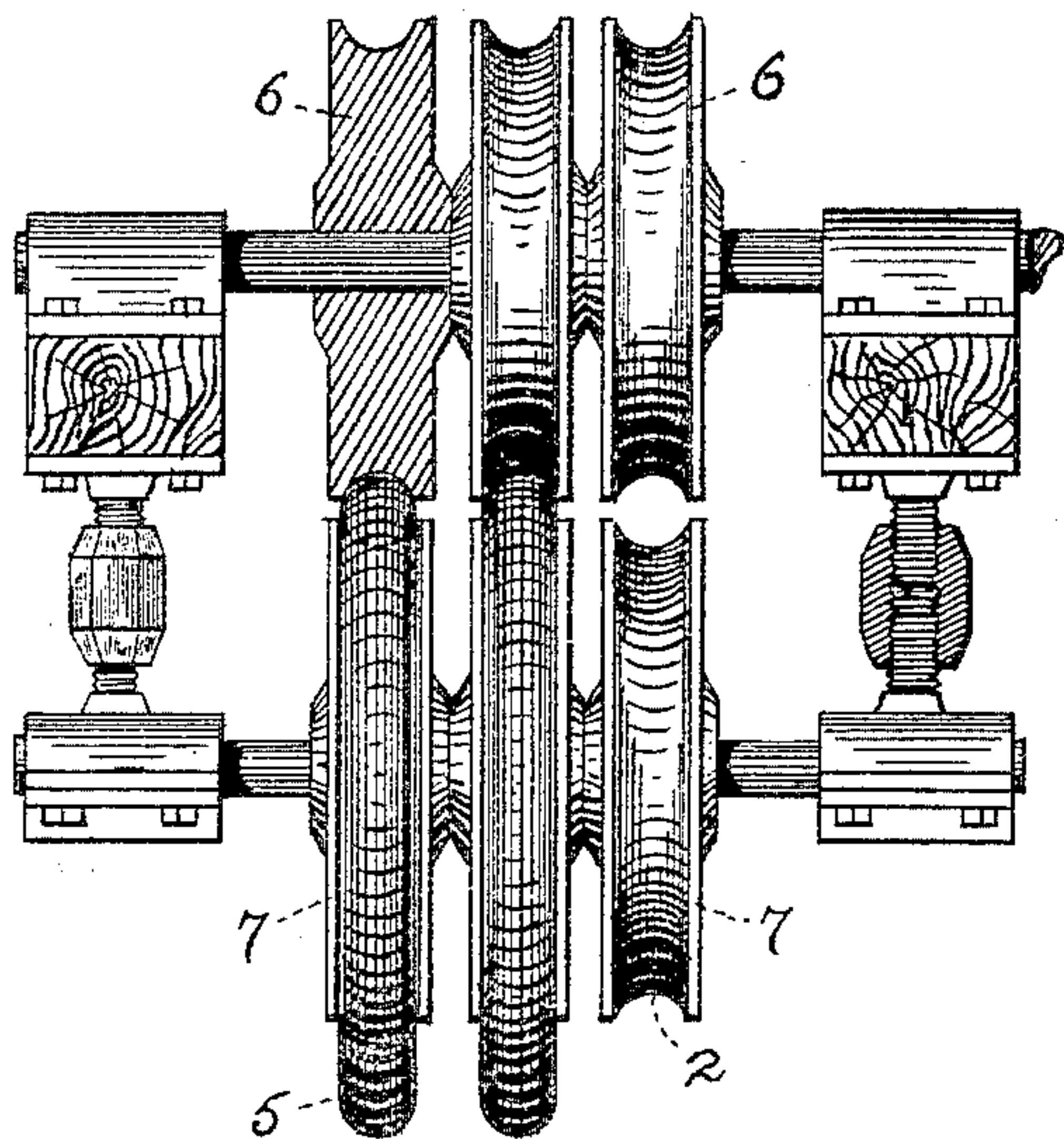


Fig. 2.

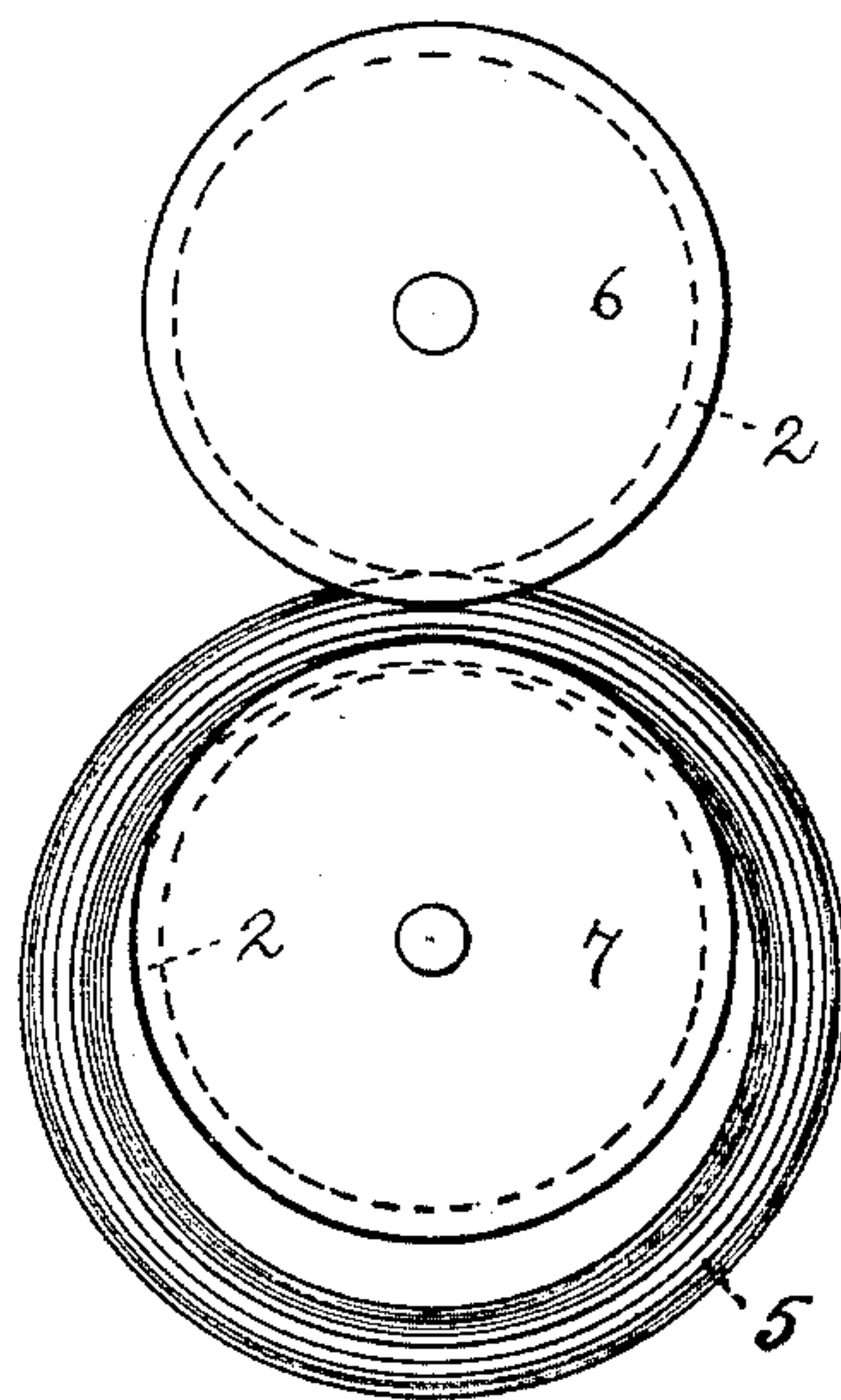


Fig. 1.

Fig. 3.

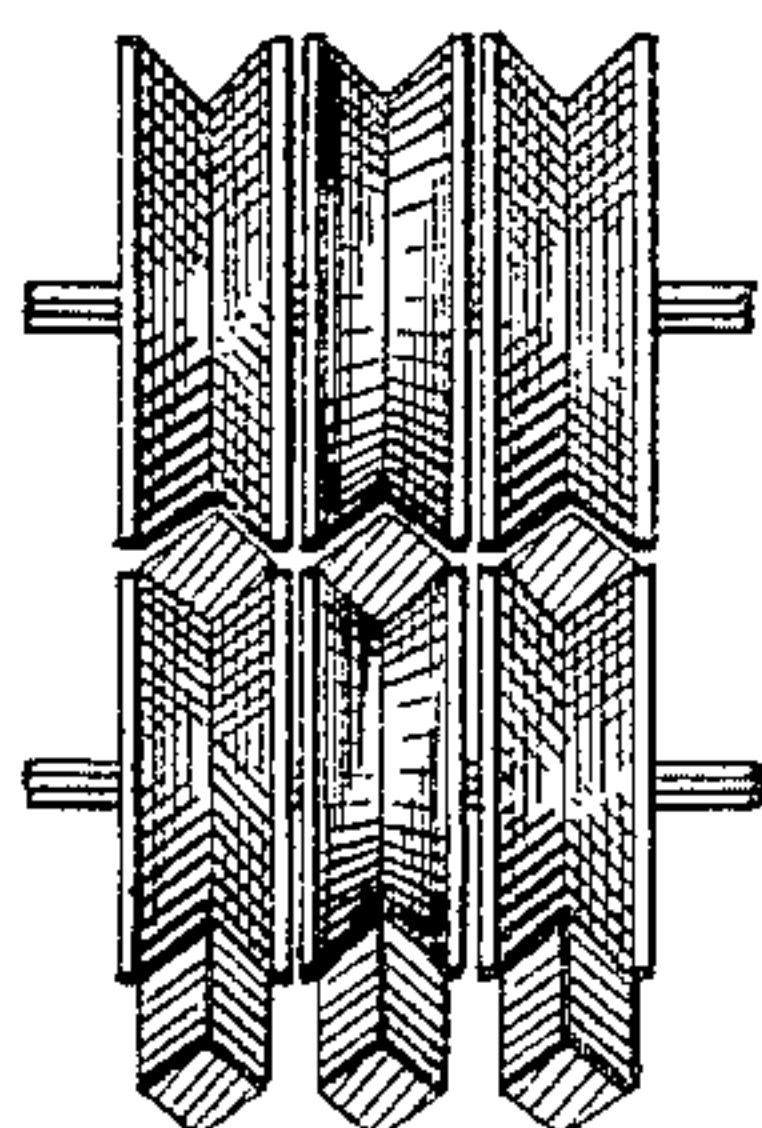


Fig. 4.

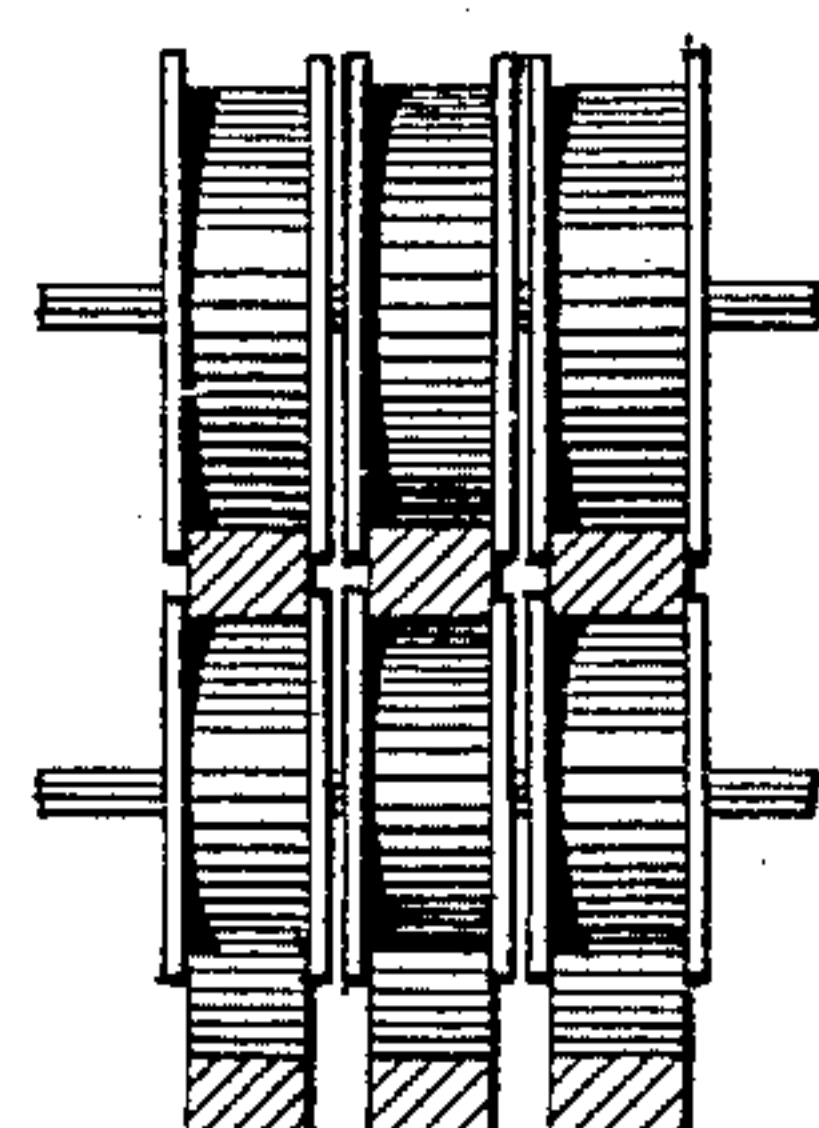
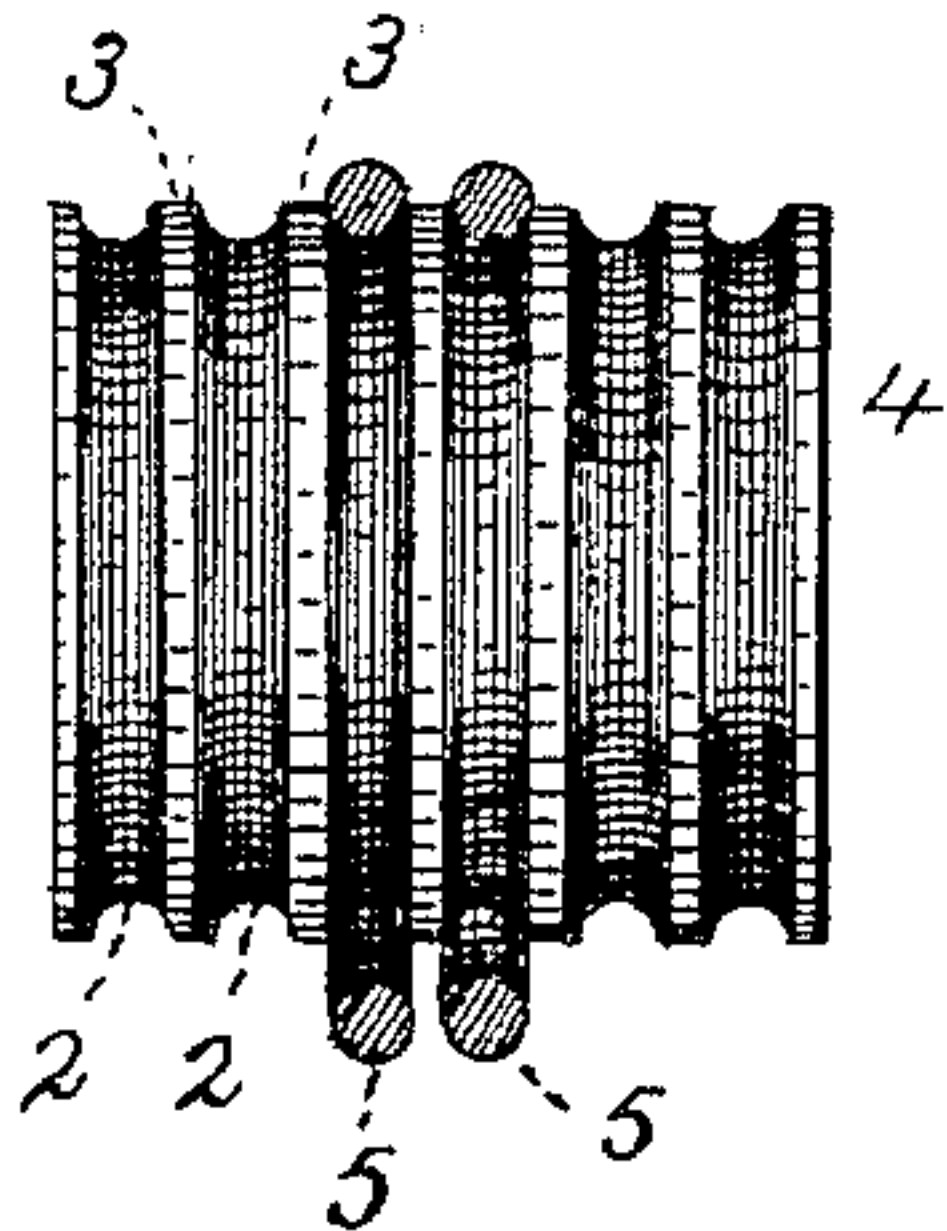


Fig. 5.

Witnesses.

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UNITED STATES PATENT OFFICE.

GEORGE FRANK EVANS, OF SOMERVILLE, MASSACHUSETTS.

FRictional GEARING.

SPECIFICATION forming part of Letters Patent No. 453,630, dated June 9, 1891.

Application filed September 5, 1890. Serial No. 364,067. (No model.)

To all whom it may concern:

Be it known that I, GEORGE FRANK EVANS, a citizen of the United States, residing at Somerville, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Frictional Gearing; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to figures of reference marked thereon, which form a part of this specification.

This invention concerns improvements in frictional gearing, particularly that class in which motion is transmitted from one line of shafting to another by means of a pair of pulleys or a number of pairs of pulleys non-contiguous but adapted to grip an endless band or a series of bands which loosely encircle one of the pulleys and pass between them.

My improvements relate especially to the construction of the bearing-face of the pulleys to accommodate a series of belts, and, further, to enable the cross-section of the endless band to be altered to secure greater frictional surface. This invention relates to and may be considered as an improvement upon an invention contained in Letters Patent numbered 426,370, and issued in my name on the 22d day of April, 1890.

The drawings herewith presented represent, in Figure 1, a side elevation of two pulleys; and Fig. 2, an elevation, partly in diametrical section, of a group of pulleys embodying my invention. Fig. 3 represents a single pulley to receive a group of bands. Figs. 4 and 5 represent modified forms of construction in the face of the pulleys taken in cross-section, said pulleys to be arranged in groups of two or more.

As before premised, this invention relates to the gripping or bearing faces of the pulleys with respect to the band, whereby the same width of pulley may be caused to transmit more power by increasing the areas of the faces as likewise that of the surface of said band. Thus, as shown in Fig. 4, the contact-surface of the belt is much larger than when a flat band is used with straight-faced pulleys. Hence when a series of bands are

grouped their combined effect is far in excess of the same number of flat bands. A further improvement consists in combining with this peculiar arrangement of bands and pulleys such construction that each band, when grouped in series, shall travel independently. Thus by reference to the above-mentioned patent it will be seen that the power is transmitted from one pulley to another by a series of contiguous bands. This idea was to obviate the slip and wear occasioned by the use of a single wide band. However, to enable each band, when several are employed in connection with a single pulley to travel independently I have formed a series of parallel grooves with intervening annular ribs. In the drawings, Fig. 3 represents a single pulley of this class, designed to carry a number of endless bands. These bands may be of any desired cross-section suitable for the purposes to which the gearing is to be used. Thus in Fig. 2 I have shown a group of pulleys in which 6 are the drivers and 7 the driven ones, while the endless bands 5 are circular in cross-section, the grooves in cross-section corresponding to a semi-cross-section of the band, but of such depth as not to permit the edges of the pulleys to touch.

To increase the power transmitted from the main shaft to the counter, a pair of pulleys of the construction shown in Fig. 3 may be employed, or in lieu thereof a series of pulleys may be grouped to act collectively, as represented in Fig. 2. It is evident that the gist of my invention is embodied in the use of several bands, either upon a single pulley or upon a group of pulleys, which collectively shall present the same bearing-face as that of the individual pulley. Thus by adding to the number of bands the power may be increased to any desired extent. Moreover, each band runs independently, and no slip occurs, as the individual bands are governed in their speed by the length of the groove in which it travels.

In Fig. 4 and 5 the pulleys are shown arranged in groups—to contain two or more—with similar and corresponding grooves cooperating to grip the endless band passing therebetween and represent modifications in the forms of the faces of the pulleys, showing that the cross-section of the groove may be

semi-polygonal, curved, or of any desired shape to receive the endless band, which approximates in section with that of the groove. In all these forms, however, the principle involved is the same, since the pulley shown in Fig. 3 is an individual, while those in Fig. 2 represent a group, the object being to enable each endless band to travel independently and be capable of multiplication, as circumstances demand.

Since the pressure upon the band varies, and ordinarily when the driven pulley and its shaft is to be stopped all pressure is to be removed, I have shown the counter-shaft to be capable of adjustment toward or from the driving-pulley with its shaft. However there are many obvious mechanical expedients by which this result may be accomplished, and as in the present instance this forms no part of my invention, I shall omit all description thereof. However this adjustment is shown in one of its many forms in Fig. 2.

What I claim is—

1. In frictional gearing, the combination, with two pulleys—a driver and a driven—suitably mounted and non-contiguous, having a series of annular grooves and intervening ribs formed upon their faces, of a series of endless bands loosely encircling one of said pulleys and adapted to pass between and be gripped by said pulleys, each band to travel independently of any other, the semi-cross-

section of each band conforming to the shape in cross-section of the groove in which it travels, substantially as set forth and explained.

2. In frictional gearing, the combination, with two pulleys—a driver and a driven—suitably mounted and non-contiguous, having a series of annular grooves and intervening ribs formed upon their faces, of a series of independently-moving endless bands loosely encircling one of said pulleys and adapted to pass between and be gripped by both pulleys, and means for causing one pulley to approach or recede from the other to control the pressure upon the bands, substantially as set forth and described.

3. In combination with a series of grooved driving-pulleys and a series of grooved driven pulleys suitably mounted but non-contiguous as to their bearing-faces, a series of endless bands adapted to loosely inclose one of said pulleys and be gripped between the two, said bands to travel in the grooves formed in each pair of co-operating pulleys, the semi-cross-section of each band conforming to the shape of each groove taken in cross-section, all operating substantially as herein stated.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE FRANK EVANS.

Witnesses:

H. E. LODGE,

J. M. WHEATON.