No. 782,479. PATENTED FEB. 14, 1905.

C. E. BECKER.

DRIVING BELT.

APPLICATION FILED MAR. 25, 1903.

2 SHEETS—SHEET 1.

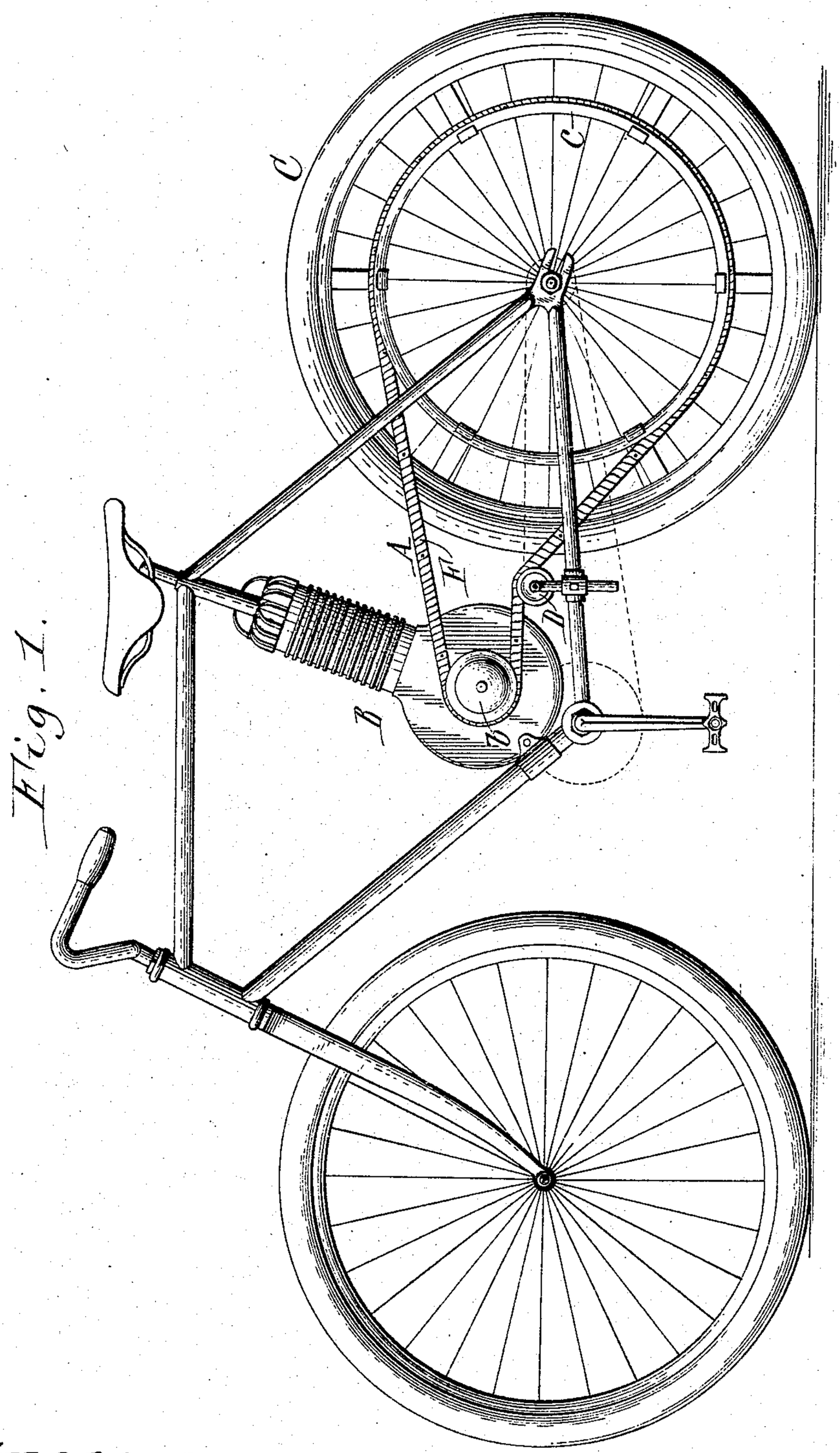

Fig. 1.

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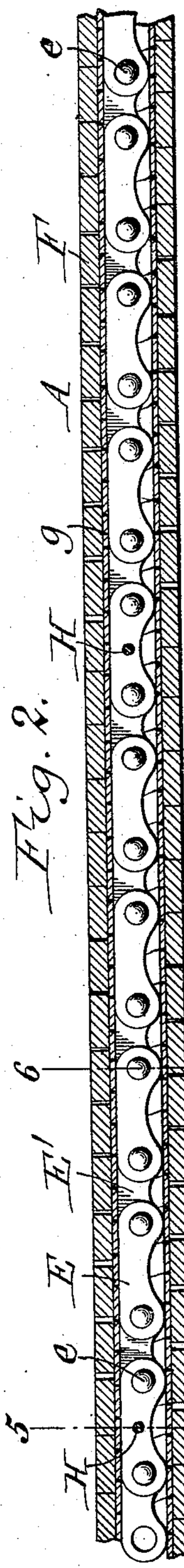

Fig. 2.

Fig. 3.

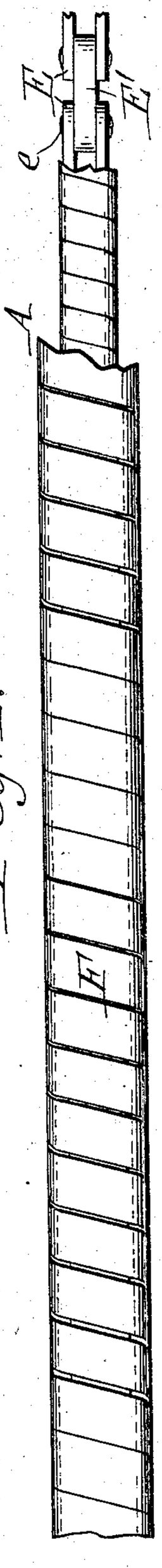

Fig. 4.

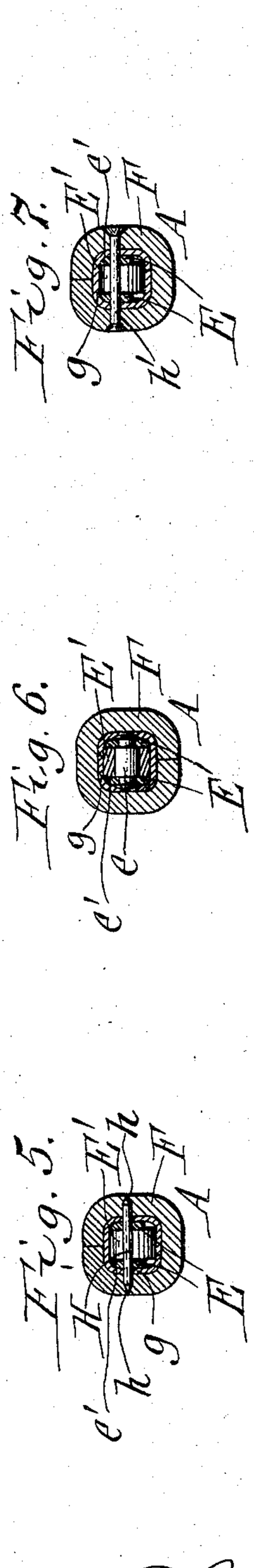

Fig. 7.

Fig. 6.

Fig. 5.

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No. 782,479. Patented February 14, 1905.

UNITED STATES PATENT OFFICE.

CLARENCE E. BECKER, OF BUFFALO, NEW YORK, ASSIGNOR TO DARIUS MILLER, OF CHICAGO, ILLINOIS, AND EDGAR KENNETH ASHBY, OF BUFFALO, NEW YORK.

DRIVING-BELT.

SPECIFICATION forming part of Letters Patent No. 782,479, dated February 14, 1905.

Application filed March 25, 1903. Serial No. 149,520.

To all whom it may concern:

Be it known that I, CLARENCE E. BECKER, a subject of the King of Great Britain, residing at Buffalo, in the county of Erie and State of New York, have invented new and useful Improvements in Driving-Belts, of which the following is a specification.

This invention relates to a driving-belt which is more particularly designed for use in motor-cycles, although the same is also desirable for other purposes.

A driving-belt best suited for use in a motor-cycle should be incapable of stretching, it should be pliable enough to pass freely around small pulleys, and it should exert sufficient traction on the pulleys for transmitting power and at the same time permit the belt to slip on the pulleys in case of emergency.

The object of this invention is the production of a driving-belt having these requisites, which is simple and durable in construction, and which can be produced at comparatively small cost.

In the accompanying drawings, consisting of two sheets, Figure 1 is a side elevation of a motor-cycle equipped with my improved driving-belt. Fig. 2 is a vertical longitudinal section of a portion of the driving-belt on an enlarged scale. Fig. 3 is a horizontal longitudinal section of the same. Fig. 4 is a side elevation of the same. Figs. 5 and 6 are cross-sections of the same in the correspondingly-numbered lines in Fig. 2. Fig. 7 is a cross-section similar to Fig. 5, showing a modification of the means for fastening the covering to the core of the belt.

Similar letters of reference indicate corresponding parts throughout the several views.

As shown in Fig. 1, my improved driving-belt A is shown applied to a motor-cycle, in which it passes around the small pulley *b* of the motor B, the large pulley or grooved rim *c* of the rear driving-wheel C, and the small pulley D of the belt-tightener. The non-stretching quality of the belt is imparted to the same by constructing its core of metal, and the traction of the same is produced by means of a covering of fibrous material inclosing the core. The latter is so constructed that it is flexible and passes freely around the pulleys. Although the flexible metal core may be constructed in various ways, I prefer to employ a longitudinal series of chain-links E E′, which are pivotally connected by transverse pins *e* in substantially the same manner as the ordinary sprocket-chain belts which are commonly used in the driving mechanism of cycles.

The covering of the core preferably consists of a strip of leather F wound spirally around the core, which produces a substantially continuous bearing-surface on the exterior of the belt for obtaining a firm grip on the pulleys, while at the same time the belt is rendered sufficiently pliable to bend freely in passing around the pulleys, thereby avoiding undue loss of power. In order to avoid undue wearing or chafing of the covering by rubbing against the core, a layer of cushion material is interposed between the core and the covering, whereby the inner side of the covering is protected from the wear of the irregular outer surface of the core. This cushion layer preferably consists of a strip *g*, of cotton or similar material, which is wound spirally around the core before the covering is applied thereto. For the purpose of preventing this cushion layer from creeping and becoming displaced the same is attached to the core and covering by means of a suitable cement. The adhesive tape commonly used in electrical work is well adapted for this purpose. By thus arranging an adhesive cushion layer between the core and covering the latter is not only protected, but also elastically connected with the core, thereby assisting to keep the parts in their proper relative position.

In order to obtain the necessary flexibility in the belt, the covering must be wound upon the core with sufficient looseness between adjacent convolutions to permit the outer parts of the convolutions to play or move toward and from each other, thereby closing and opening the space between the same as the belt bends and unbends in passing around a pulley. It has been found by experience that

when the covering is wound on the core with its convolutions resting loosely against each other in this manner the covering is liable to creep and cause the slack to be taken out of one part of the covering and gather the convolutions in a tight or solid bunch at another part of the covering. The result is that those portions of the core upon which an excess amount of the slack in the covering has been taken out are uncovered to an objectionable extent, producing an uneven bearing of the belt, while those portions of the belt where the convolutions are bunched tight are comparatively stiff, causing the belt to run irregularly. For the purpose of avoiding this excessive bunching or gathering of the covering in any one place on the core the covering and core are connected at short intervals by fastenings. The preferred form of fastenings consists of transverse pins H, each of which is arranged at its central portion in openings in a pair of the links E of the chain-core and has its opposite ends tapering or pointed and entering the adjacent parts of the cushion layer and covering, as shown at *h*, Figs. 3 and 5.

In assembling the parts of the driving-belt the pointed pins are first placed on the chain-core and then the cushion layer and covering are successively wound upon the core sufficiently tight so that the ends of the fastening-pins pierce the cushion and covering. The length of the fastening-pins is such that their outer ends are flush, or nearly so, with the outer side of the covering, but do not project beyond the same in the finished condition of the belt. Instead of employing fastening-pins, which are applied to the core preparatory to winding the covering on the same, the covering may be first wound on the core and then fastened to the same by pins *h'*, which are passed through the chain core and covering and secured in place by riveting the opposite ends thereof against the outer side of the covering, as shown in Fig. 7. By thus positively connecting the core and covering of the belt at short intervals the same is divided into a plurality of sections, whereby the creeping and bunching of the spiral covering is distributed uniformly along the entire belt and undue exposure of the core at any one place is prevented. As shown in Figs. 2, 3, and 4, the convolutions of the covering immediately in rear of each fastening-pin are drawn apart, while the convolutions in front of each fastening-pin are crowded together. This separation and crowding of the cover-convolutions at intervals is, however, not very pronounced, owing to the distribution of the same, and therefore does not impair the working of the same.

In order to prevent the pivotally-connected links of the chain-core from cutting the cushion layer and covering, the outer longitudinal corners of the links E are rounded, as shown at *e'*, Figs. 5, 6, and 7, thereby avoiding not only the cutting effect of the chain, but also permitting of making the driving-belt nearly round in cross-section, which enables the same to obtain a firm grip in the groove of the pulleys with which it coöperates.

I claim as my invention—

1. A driving-belt comprising a flexible metal core, a fibrous covering, and transverse pins mounted at intervals on the core and each having its opposite ends pointed and entering said covering, substantially as set forth.

2. A driving-belt comprising a core composed of connected metal links, a spirally-wound fibrous covering, and transverse pins mounted on the links and having pointed ends which enter the covering, substantially as set forth.

3. A driving-belt comprising a core composed of connected metal links, a spirally-wound fibrous covering, a spirally-wound cushion interposed between the core and covering, and transverse pins passing at intervals through said core, covering and cushion, substantially as set forth.

4. A driving-belt comprising a core composed of a longitudinal series of metal links connected by transverse pivot-pins, a covering consisting of a spirally-wound strip of leather, a spirally-wound strip of adhesive cushion material interposed between the core and covering, and transverse fastening-pins mounted at intervals on said links and each having its opposite ends pointed and entering said cushion and covering, substantially as set forth.

Witness my hand this 20th day of March, 1903.

CLARENCE E. BECKER.

Witnesses:
JAMES R. KOEN,
ORION F. THOMAS.