

(No Model.)

3 Sheets—Sheet 1.

M. GANDY.

CHAIN OR ROPE BELTING FOR DRIVING MACHINERY.

No. 377,484.

Patented Feb. 7, 1888.

Fig. 1.

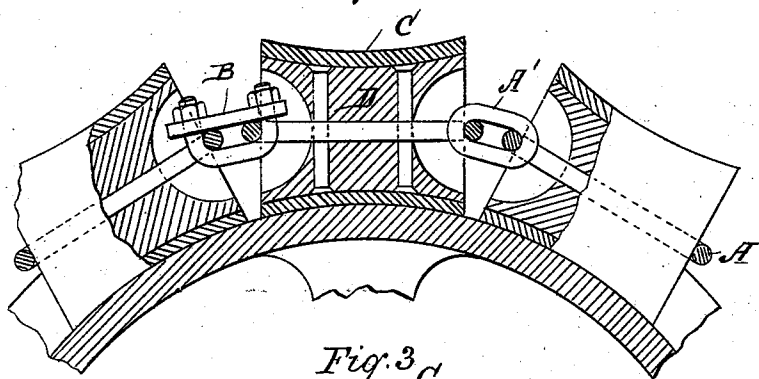


Fig. 2.

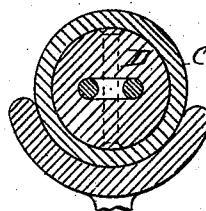


Fig. 3.

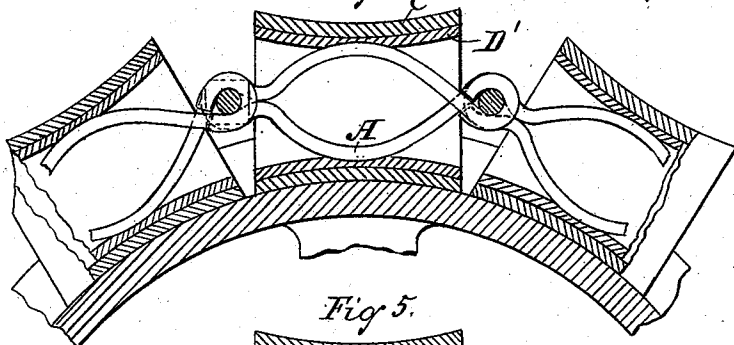


Fig. 4.

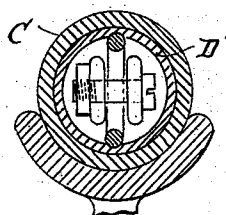


Fig. 5.

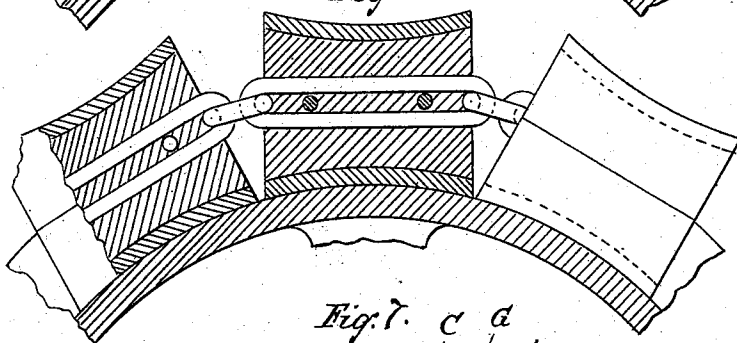


Fig. 6.

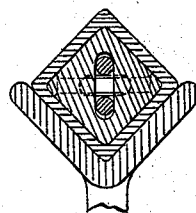


Fig. 7.

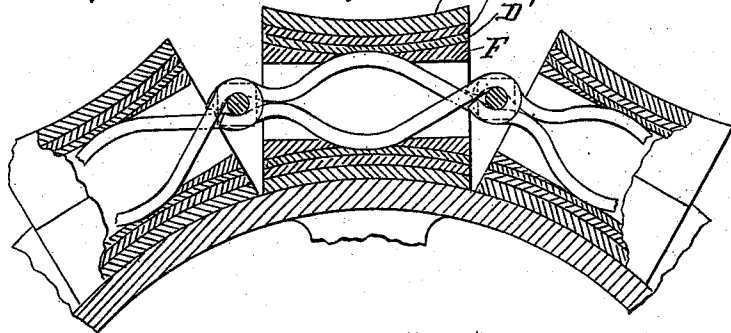
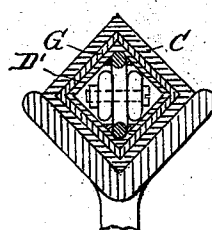


Fig. 8.



Witnesses:
H. M. Smith,
Robert Bartlett

Inventor.
Maurice Gandy
by Broadner & Hall

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Fig. 9.

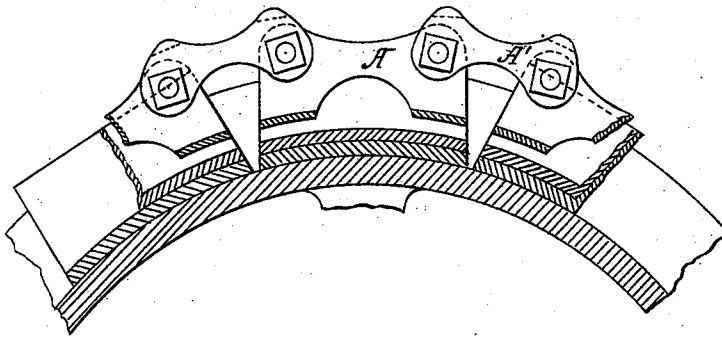


Fig. 10.

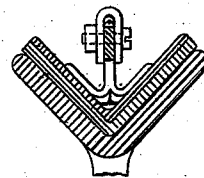


Fig. 11.

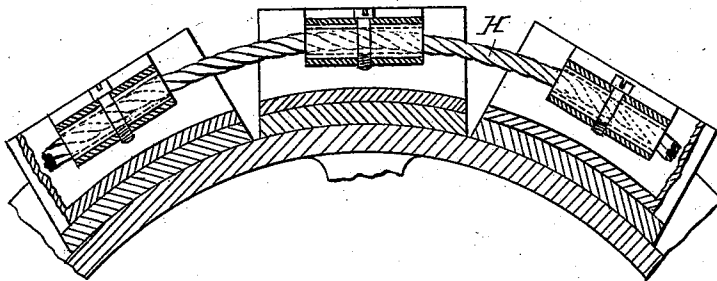


Fig. 12.

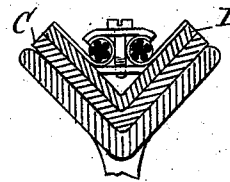


Fig. 13.

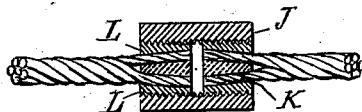


Fig. 14.



Fig. 15.



Witnesses:
H. H. Smith,
Robert Bartlett.

Inventor,
Maurice Gandy,
& Broadman & Pile.

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M. GANDY.

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Fig. 16.

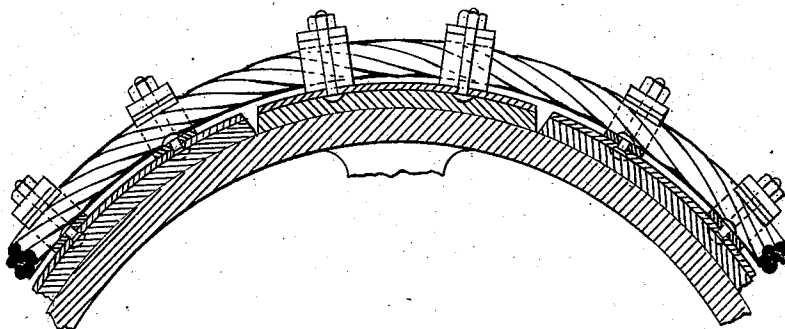
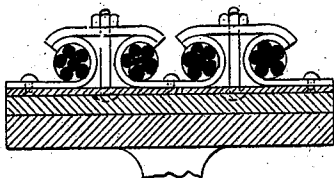


Fig. 17.



Witnesses:
H. H. Smith.
Robert Bartlett.

Inventor.
Maurice Gandy.
J. Brown & Co.

UNITED STATES PATENT OFFICE.

MAURICE GANDY, OF LIVERPOOL, ENGLAND.

CHAIN OR ROPE BELTING FOR DRIVING MACHINERY.

SPECIFICATION forming part of Letters Patent No. 377,484, dated February 7, 1888.

Application filed February 16, 1887. Serial No. 227,769. (No model.)

To all whom it may concern:

Be it known that I, MAURICE GANDY, a subject of the Queen of Great Britain, residing at Liverpool, England, have invented certain new and useful Improvements in Chain or Rope Belts for Driving Machinery, of which the following is a description in such full, clear, concise, and exact terms as to enable any one skilled in the art to which my invention appertains to make and use the same, reference being had to the accompanying drawings, making part of this specification, and to the letters and figures of reference marked thereon.

In said drawings, Figures 1, 3, 5, 7, 9, 11, and 16 represent longitudinal sections of bands for driving machinery made according to my present invention, and the pulleys upon which they run. Figs. 2, 4, 6, 8, 10, 12, and 17 represent cross-sections of the same, respectively; and Figs. 13, 14, and 15 represent a novel device for connecting the ends of the ropes which may be used in the practice of said invention.

Bare wire ropes running in grooved pulleys have heretofore been used as belts or bands for driving machinery. While such ropes have great strength, still they have two obvious and well-known defects—viz., they are deficient in gripping-power and are quickly worn out and become useless by chafing upon the grooves in the metal pulleys upon which they run. Round or angular belts of leather have been used, and while they are satisfactory as far as gripping-power is concerned, they are not entirely free from objections. Their fibrous character permits them constantly to stretch and makes it necessary frequently to shorten them to maintain their driving-power; besides, they are very expensive and are not as strong as wire ropes.

I am also aware that metal chains and wire ropes provided with friction-surfaces have been used; but in all such belts with which I am acquainted the friction blocks or surfaces have been fashioned and combined or attached to the chain or rope in such a manner as to make the belt as a whole objectionable for various reasons. My present invention consists of improvements on this class of belting, and the novel features will be particularly pointed

out in the claims concluding this specification.

Referring to the drawings, Fig. 1, A A' represent the links of a chain. B represents a removable link for the purpose of uniting the two ends of the chain. All the small or alternate links A' may be made of the construction represented by B, or as many of them as may be deemed advisable may be made of such construction, so that the chain may be readily opened and joined again at any point. The friction-blocks may be made wholly of wood, leather, paper, cork, vulcanized rubber, or other suitable material, or a combination of any of these, or they may be made with a metal core or tube faced with a friction covering or surface. These blocks are made from two to three inches long, preferably, and of a shape and size to fit the pulleys, and are separated by intervening spaces to allow them to run around the pulley without binding. To utilize their entire surface for gripping the pulley, I usually curve or hollow these sections to correspond with the periphery of the pulleys on which they are to run, as illustrated in the drawings. This feature may, however, in many cases be dispensed with, especially when the blocks are made of or covered with vulcanized rubber or cork, or other compressible material, as in that case they will accommodate themselves to the periphery of the pulley and grip it throughout their entire length when made straight.

In carrying my invention into practice I may use any form of chain. Several desirable forms are illustrated in Figs. 1, 3, 5, 7, and 9. In Fig. 1 the core of the gripping-block, formed of wood, is illustrated by D, upon which the gripping material C is attached in any suitable manner and by any desirable means. In Fig. 3 the core of the friction-block is made of a tube of metal, D', preferably steel, upon which the gripping-surface C is attached, preferably by rivets. (Not shown in the drawings.) Near the center of the tube D', in the inside of said tube, a groove is cut into which the link A' fits, thereby preventing the friction-block moving longitudinally on said link, but leaving sufficient play between the two to allow the block to tilt upon the link as a joint or socket.

Fig. 5 shows a square belt, substantially of similar construction with the round belt illustrated in Fig. 1. Fig. 7 shows a square belt of similar construction in many respects to the round belt illustrated in Fig. 3. In Fig. 7, however, the friction-blocks are held upon their respective links by means of checks F F, inserted inside of the tubes D'. Immediately in top of the metal tube D' a layer of paper is placed, which in time is covered by a layer of cork, or leather, or rubber, C. In Fig. 9 the friction-blocks are attached directly to the long links A, between which are placed the short links A', which likewise permit the blocks to find their bearings on and accommodate themselves to the pulley. These several figures illustrate various forms of chains which may be advantageously employed in the practice of my present invention, as well as various forms of friction-blocks, and various means of attaching the blocks to said chains, and are deemed sufficient to indicate clearly the general practice of my invention when link chains are employed.

Instead of using a link chain I may employ a wire rope, as indicated in Figs. 11, 12, 16, and 17. Figs. 11 and 12 illustrate a V-shaped belt made to run on a grooved pulley, and Figs. 16 and 17 illustrate a flat belt made to run on a plain pulley. The wire ropes H are attached to the core I of the belt, made of wood, metal, or other suitable material, which is covered with a friction-surface, C.

For the purpose of giving the necessary flexibility to the belt and to permit the several friction-blocks to accommodate themselves without restraint to the periphery of the pulley, I attach the blocks to the rope by a cleat or similar device, grasping the wire rope at intervals and presenting only sufficient bearing-surface on the rope to resist the strain, thus making an easy clinging fastening, and permitting the blocks to tilt and accommodate themselves readily to the face of the pulley.

I prefer to use a plurality of small ropes placed side by side instead of a single rope of larger diameter. By so doing I distribute the pressure more evenly throughout the width of the belt, and I remove the liability of the belt to twist and insure the friction blocks or cushions running straight in the grooves, and, besides, as the several ropes may be spliced at different points, the belt is made of more uniform strength throughout its entire length. I further improve the action of these friction-blocks by making the bearing in said blocks for the connecting rope or chain as low as possible, and, where convenient, below the upper edges of the grooves in which they run, thus increasing their stability and diminishing the danger of tilting or twisting in the grooves.

If desired, the ropes may be spliced in any well-known way; but I prefer to join the ends by the means illustrated in Figs. 13, 14, and 15. Fig. 15 illustrates a ferrule of uniform external diameter, cut with a screw-thread and

having a diminishing or tapering internal diameter, as clearly shown in Fig. 13. Such a ferrule is slipped upon each end of the rope, small end first, so that the larger end comes at the extreme end of the rope. The strands of the rope are then forced apart by a pointed tool, and melted solder or cement is poured between the strands, attaching to the strand and making a solid rivet-headed mass and securing the wires firmly in the ferrule. The inside of the ferrule may be previously tinned or coated with other metal to which the solder will adhere. In order to increase the space between the strands to receive the solder or cement and to eliminate from the ferrule all objectionable elements, I burn out the hemp core of the rope before pouring in the solder. The two ends of the rope are then drawn together and an internally-screw-threaded ferrule (having a right-hand thread cut in one-half of its length and a left-hand thread cut in the other) is screwed upon the ferrules L until the necessary tension is secured. To this ferrule I then preferably apply a suitable covering to avoid the noise incident to the striking of the metal ferrule against the face of the pulley.

I have now described the general features of my invention and indicated various forms in which it may be applied; and I understand that any formal change not affecting the principal or general features of the invention will be included in the foregoing description and in the following claims.

It will be observed that one of the principal features of my invention consists in constructing a chain or wire-rope belt in which the individual friction-blocks will independently and freely adapt themselves to the surface of the pulley. This may be accomplished by attaching the blocks to a chain, so that they may have an independent motion of their own, as illustrated in Figs. 1, 2, 3, 4, 5, 6, 7, and 8, or by attaching the blocks firmly to the links and providing intermediate links between them, as illustrated in Figs. 9 and 10, or by attaching blocks to a wire rope with a limited bearing-surface and play, so arranged that the rope may bend and describe practically a true arc in passing around the pulley and then straighten itself out in running between the pulleys. These, or substantially similar devices, may be employed, so as to give to the friction-surfaces that degree of adaptability and independence of motion which is essential to the best forms of belt.

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

1. A belt for driving machinery, consisting of the combination of a flexible metal band, friction-blocks attached thereto, and means, substantially as described, for permitting said blocks to tilt on said band and to accommodate themselves to the surface of the pulleys on which they run.

2. A belt for driving machinery, consisting of the combination of a flexible metal chain,

formed of long and short links alternately, and friction-blocks attached thereto, all substantially as described.

5 3. A belt for driving machinery, consisting of the combination of a flexible metal band and friction-blocks composed of a metal shell covered with a friction-surface, substantially as described.

4. In a belt for driving machinery, the com-

10 bination of a metal chain, friction-blocks attached thereto, and means, substantially as described, for limiting the longitudinal movement of said block on said band.

MAURICE GANDY.

Witnesses:

M. LEE SMITH,
CHARLES LADE.