

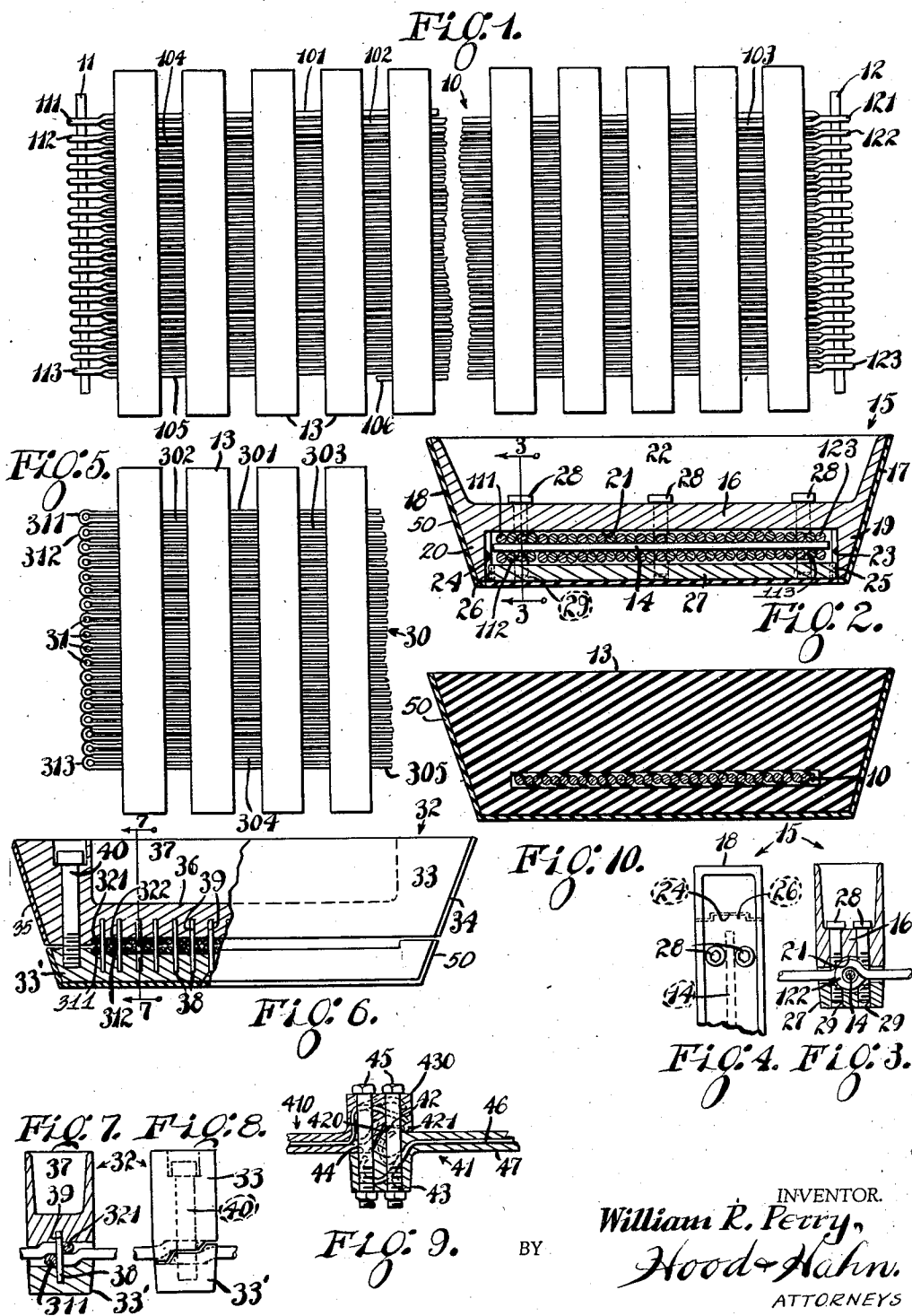
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SPLICEABLE BELT

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SPLICEABLE BELT

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The present invention relates to power transmission belts, and more particularly to that general type of belts which comprises a body, ribbon, or strand having considerable tensile strength but relatively little lateral rigidity, and a series of transverse blocks of considerable rigidity mounted upon said body in longitudinally spaced parallel relation. Belts of this character are primarily intended for use in association with V-pulleys, or with one V-pulley and one flat-faced pulley; and the function of the blocks, of course, is to effect a driving connection with the angularly related faces of the V-pulleys and to transmit force between those pulley faces and the longitudinally strong strand or web of the body portion.

Broadly, the primary object of the present invention is to improve belts of the character above described. One phase of the invention is the provision of such a belt in which each block is an integral unit completely enveloping the belt body or strand and secured to the same without the use of extraneous fastening means. More particularly, such a block is preferably formed of hardened moldable material, being molded in place upon the strand while in plastic condition, and subsequently hardened in any suitable manner, so that it will adhere to its position on the strand.

Another phase of the invention has to do with the provision of splicing means during the formation of the body strand. According to the present invention, the body strand consists of a continuous piece of material arranged in a plurality of parallel runs merging with each other in loops at the opposite ends of the belt, the loops at one end of the belt being registrable with the loops at the other end of the belt, whereby means may be threaded through loops at one end of the belt and registering loops at the other end of the belt to form a splice. Still another phase of the invention has to do with the provision of a reinforcing block for association with the splicing means.

Further objects of the invention will appear as the description proceeds.

To the accomplishment of the above and related objects, my invention may be embodied in the forms illustrated in the accompanying drawing, attention being called to the fact, however, that the drawing is illustrative only, and that change may be made in the specific constructions illustrated and described, so long as the scope of the appended claims is not violated.

Fig. 1 is a plan view of one form of belt

constructed in accordance with the present invention;

Fig. 2 is a transverse section through a splice block unit associable with the form of belt illustrated in Fig. 1;

Fig. 3 is a section taken substantially on the line 3-3 of Fig. 2 and looking in the direction of the arrows;

Fig. 4 is a fragmentary plan view of the splice block of Fig. 2;

Fig. 5 is a fragmentary plan view of a different form of belt constructed in accordance with the present invention;

Fig. 6 is an elevation of a splice block unit associable with the belt of Fig. 5, parts being broken away for clarity of illustration.

Fig. 7 is a section taken substantially on the line 7-7 of Fig. 6 and looking in the direction of the arrows;

Fig. 8 is an end elevation of the splice block unit of Fig. 6;

Fig. 9 is a fragmentary longitudinal section through the interlocked ends of a further form of belt constructed in accordance with the present invention; and

Fig. 10 is a transverse section through a stiffener block associated with a belt of the character illustrated in Figs. 1 or 5.

Referring more particularly to Figs. 1 to 4, the reference numeral 10 indicates generally a belt body, ribbon, strand, or web made up of a plurality of runs of a continuous piece of cord or the like. The belt body is preferably produced by suitably stretching the cord between supported rods 11 and 12. Thus, one run 101 may extend from a point between the rods 11 and 12 and be passed around the rod 11 to form a loop 111. It then extends in a second run 102 parallel to the first run 101 from the rod 11 to the rod 12, being passed about the rod 12 to form a loop 121. It then extends, as run 103, back to the rod 11, and is passed about said rod to form a loop 112; thence continuing as run 104 to pass about the rod 12 as loop 122; and so on until a sufficient width has been produced, as at the loop 113 about the rod 11, whence the cord extends as run 105 to and about the rod 12 to form loop 123, and thence, as run 106 back to a point between two rods 11 and 12. The free ends of the runs 101 and 106 may be secured in place in any desired manner; and, if desired, the completed web or ribbon may now be treated with any desired material to bind the adjacent runs together.

It will be seen that the above operations will

have produced a body consisting of a continuous longitudinally stressed member arranged in a plurality of adjacent parallel runs merging with each other in loops at opposite ends of the belt, said loops being disposed in substantially parallel planes substantially perpendicular to the plane of the belt body.

Suitable stiffening blocks 13 may now be applied to the belt body in any desired manner. Split blocks made up of upper and lower units adapted to engage opposite faces of the belt may be secured thereto by any suitable clamping means; but preferably stiffener blocks will be applied to the belt body as integral units, each completely enveloping a section of the belt body. Any suitable moldable and hardenable material may be used; and I have found hard rubber to be one adaptable material for this purpose. The rubber, in moldable condition, may be applied to the belt body in the desired form and subsequently treated to cause it to harden sufficiently to withstand the longitudinal compressive forces to which it will be subjected in use. If desired, friction material 50 may be applied to each block before the hardening process; or such material may be suitably applied to the end and inner surfaces after hardening of the block material.

In Fig. 10, I have illustrated the transverse contour of such a block before the application of the above-mentioned friction material.

The belt may now be removed from the rods 11 and 12; and the loops of the 121 series brought into inter-digitating relation with the loops of the 111 series; whereafter a member 14 may be passed through the registering eyes of all of the loops of both series to complete a splice. The member 14 may be of any desired material.

In order to reinforce the splice, a block unit 15 is preferably associated therewith. The unit 15 consists of an outer member comprising a transverse beam 16 carrying at its opposite ends surfaces 17 and 18 which are allochirally angularly related to a median plane perpendicular to the plane of the belt body, so that said surfaces will cooperate operatively with the angular surfaces of a V-pulley. Friction material 50 will be secured to the surfaces 17 and 18. The unit 15 may be made of any desired material, such as wood, metal, plastics, and the like.

The surfaces 17 and 18 continue below the beam 16 as legs 19 and 20 which are transversely separated to provide a socket 21 for the reception of the belt splice. The surfaces 17 and 18 are joined by a heat-dissipating fin 22, thereby defining an outwardly opening socket. The spliced loops of both series are introduced into the socket 21, and thereafter a bottom plate 27 is associated with the upper block unit. Preferably, the legs 19 and 20 are formed, in their adjacent surfaces, with grooves 23 and 24 adapted to receive tongues 25 and 26 on the opposite ends of the plate 27; and a plurality of bolts 28 pass through the beam 16, between the spliced loops of the belt body, and into threaded bores 29 formed in the plate 27, whereby the plate 27 may be drawn up to clamp the splice in place in the socket 21.

The form of belt illustrated in Figs. 5 to 8 comprises a body 30 similar to the body 10, and likewise made up of a plurality of substantially parallel runs of a continuous, longitudinally stressed cord or the like. In producing the belt body 30, the operator will make use of two series of upstanding pins 31. The first run of cord 301 will extend from a point intermediate the two series

of pins and around the first pin of one series to form a loop 311; thence, in a parallel run 302, to and around the first pin of the other series to form a loop 321 (see Fig. 6). Thence, the cord returns as run 303 to pass about the second pin of the first series to form loop 312; and thence back to the other series of pins. This is continued until run 304 passes about the last pin 31 to form loop 313, whence the cord returns, as run 305, to a point intermediate the two series of pins. Blocks 13 may now be applied to the belt body in the manner above described; whereafter, the belt may be lifted off the two series of pins 31.

It will be seen that the loops of this form of belt lie in planes substantially parallel to the plane of the belt body. To form a splice, with this form of belt, the loops at one end of the belt are brought into registering overlapping relation with the loops of the other end of the belt, only one loop of the 311 series registering with each loop of the 321 series, in the manner clearly illustrated in Figs. 6, 7, and 8.

A splice block unit 32 for use with this type of belt comprises an upper block 33 formed with angularly related surfaces 34 and 35 and a connecting beam 36 which may be centrally relieved as at 37 to reduce weight; and a mating lower unit 33' formed at its ends to define continuations of the surfaces 34 and 35. A plurality of upstanding pins 38 is carried by one of the above-mentioned units, while the other of said units is formed with pin receiving sockets 39. Each of the pins 38 passes through the registering eyes of one loop of the 310 series and one loop of the 320 series, and thence into its socket 39; and the two units are clamped together by a plurality of bolts 40 carried by the upper unit and threadedly engaging sockets in the lower unit.

The splice block 32 may be formed of any desired material, such as wood, metal, or plastics; and, if desired, the pins 38 may be either integral with, or secured to, either one of the units 33 and 33', while the other of said units will be socketed for the reception of the projecting ends of said pins.

Fig. 9 illustrates a simplified form of splice. According to this form of the invention, the belt comprises a body 46 of cords or the like and a cover 47 of rubber or similar material. Vulcanized to be integral with the cover 47 of an end 41 of the belt is a transversely arranged projection 42 extending out of the plane of the belt; and an integral transverse block 43 extending oppositely out of the plane of the belt and formed to provide a seat 44. The other end 410 of the belt is provided with an integrally vulcanized transverse block 430 of rubber or similar material which is formed on its inner face with a seat 420 for the reception of the projection 42, and with an extension 421 adapted to lie behind the projection 42 and to extend substantially into the plane of the belt end 41. The main body of the belt end 410 is received upon the seat 44 of the block 43, while the extension 42 is received within the seat 420 of the block 430; and bolts 45 are passed through the two blocks 43 and 430 to hold the same in the above-described interlocked relation.

I claim as my invention:

1. An edge-active belt comprising a longitudinally stressed member looped at one end of the belt, extending the full length of the belt to a loop at the opposite end, and returning to form a second loop at the first-mentioned end, a plurality of blocks of trapezoidal cross section

secured to said member at spaced points in the length of said belt, means passing through at least one loop at each end of said belt to splice the ends of said belt, and block means operatively associated with said last-named means to reinforce the splice.

2. A belt comprising a continuous strand arranged in a plurality of substantially parallel runs joined by loops at the opposite ends of said runs, means threaded through loops at one end of said belt and through loops at the other end of said belt to form a splice, and means operatively associated with said last-named means to reinforce said splice.

3. A belt comprising a continuous strand arranged in a plurality of substantially parallel runs joined by loops at the opposite ends of said runs, said loops lying in substantially parallel planes substantially perpendicular to the common plane of said runs, and means threaded through all of said loops to form a splice.

4. A belt comprising a continuous strand arranged in a plurality of substantially parallel runs joined by loops at the opposite ends of said runs, said loops lying in substantially parallel planes substantially perpendicular to the common plane of said runs, means threaded through all of said loops to form a splice, and means operatively associated with said last-named means to reinforce said splice.

5. A belt comprising a continuous strand arranged in a plurality of substantially parallel runs joined by loops at the opposite ends of said runs, said loops lying in substantially parallel planes substantially perpendicular to the common plane of said runs, and the loops at one end of said belt being arranged in interdigitating registry with the loops at the other end of said belt, and means threaded through all of said loops to form a splice.

6. A belt comprising a continuous strand arranged in a plurality of substantially parallel runs joined by loops at the opposite ends of said runs, the loops at each end of said belt lying substantially in a common plane parallel to the common plane of said runs, and a plurality of pins, each passing through a loop at one end of said belt and a loop at the other end of said belt to form a splice.

7. A belt comprising a continuous strand arranged in a plurality of substantially parallel

runs joined by loops at the opposite ends of said runs, the loops at each of said belt lying substantially in a common plane parallel to the common plane of said runs, and splice means comprising a block carrying a plurality of spaced parallel pins, each of said pins passing through a loop at one end of said belt and a loop at the other end of said belt, a mating block socketed to receive the projecting ends of said pins, and means securing said blocks together on opposite sides of said belt.

8. An edge-active belt comprising a longitudinally stressed member looped at one end of the belt, extending the full length of the belt to a loop at the opposite end, and returning to form a second loop at the first-mentioned end, and a plurality of blocks of trapezoidal cross section secured to said member at spaced points in the length of said belt, certain of said blocks being provided with means passing through at least one loop at one end of said belt and with means passing through at least one loop at the other end of said belt to splice together said ends of said belt.

9. A belt comprising a continuous strand arranged in a plurality of substantially parallel runs joined by loops at the opposite ends of said runs, the loops at each end of said belt lying substantially in a common plane parallel to the common plane of said runs, and splice means comprising a block carrying a plurality of spaced parallel pins, certain of said pins passing respectively through loops at one end of said belt and certain of said pins passing respectively through loops at the other end of said belt, a mating block cooperating with said first-named block to hold said pins in position, and means securing said blocks together on opposite sides of said belt.

10. A belt comprising a body made up of a plurality of substantially parallel runs of cord embedded in an envelope of binding material, a plurality of longitudinally-spaced transverse stiffener blocks associated with said body, each of said blocks completely enveloping its associated section of belt body and being substantially incompressible in a direction transverse to the length of said body, and a thin layer of relatively soft, high-friction, compressible material secured to the friction surfaces of each of said blocks.

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