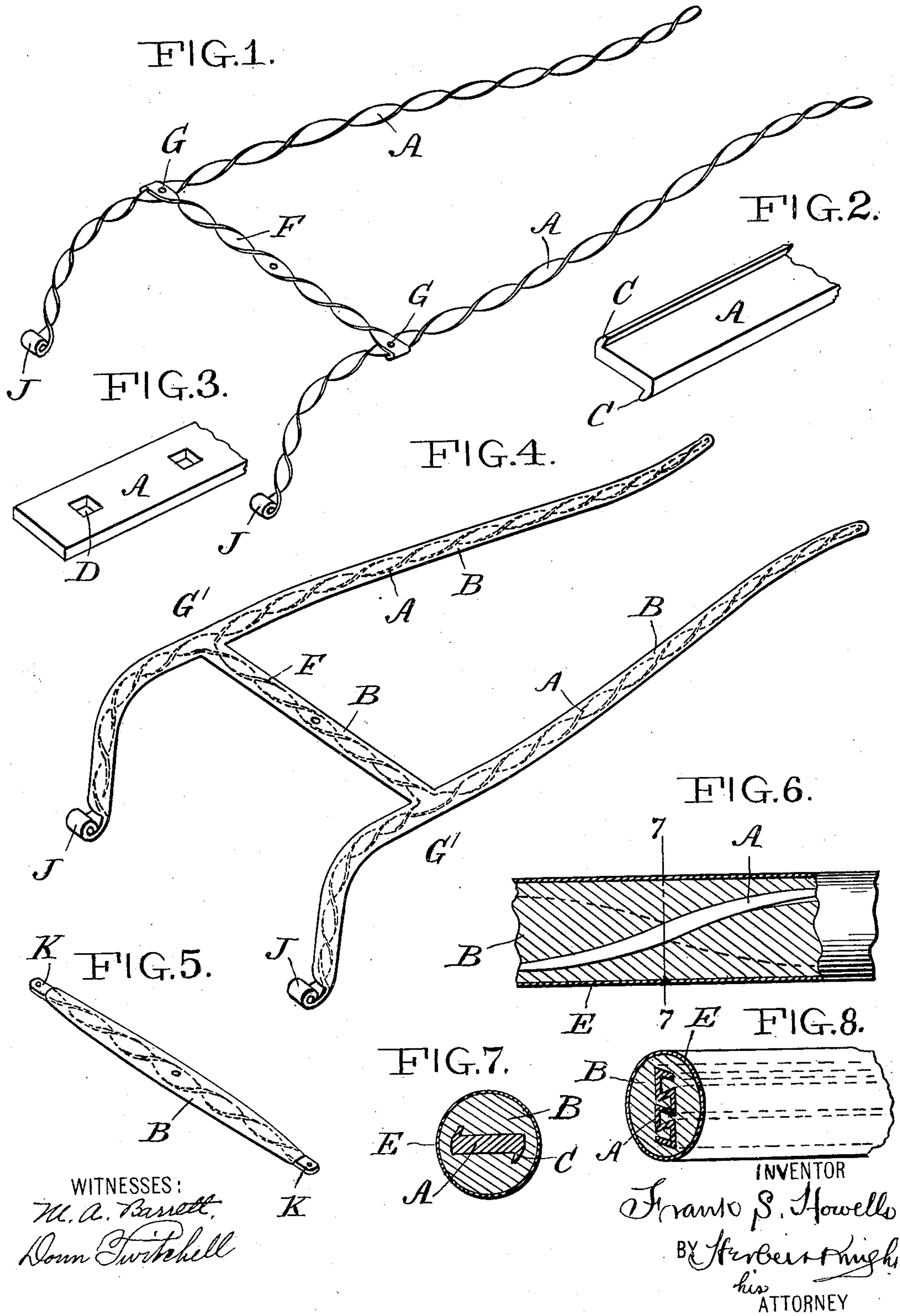


No. 896,992.

PATENTED AUG. 25, 1908.

F. S. HOWELLS.
SHAFTS FOR VEHICLES.
APPLICATION FILED MAY 3, 1907.



UNITED STATES PATENT OFFICE

FRANK S. HOWELLS, OF PORT WASHINGTON, NEW YORK.

SHAFTS FOR VEHICLES.

No. 896,992.

Specification of Letters Patent.

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Application filed May 3, 1907. Serial No. 371,656.

To all whom it may concern:

Be it known that I, FRANK S. HOWELLS, a citizen of the United States of America, residing in Port Washington, Nassau county, and State of New York, have invented certain new and useful Improvements in Shafts for Vehicles, of which the following is a specification.

My invention relates, broadly speaking, to a new and improved shaft for vehicles, such as carriages, wagons, buggies, etc., but it may also be employed for whiffletrees, poles and other parts of a vehicle where the particular strains to which such part is subjected are of such a nature as will enable and recommend the employment of my said invention.

My invention consists essentially of a metallic strand, core or skeleton which is so located and arranged as to assume the main tensional strain when the shafts are in use, and in combination with this I form a completing, enveloping body or filler, which surrounds the metallic part and builds it out to the proper proportions and shape, as will be explained. The enveloping body or filler is composed preferably of papier mâché, but I may use wood pulp or other suitable substance; a fibrous material is best however.

The metallic strand, core or skeleton is made preferably of steel, but I do not limit myself to steel, but I prefer to employ this metal or some metal which has a certain amount of spring to it; a metal which takes a set upon being bent would be undesirable. It must also be borne in mind that the shafts which I propose constructing out of the combination of the above materials must conform, approximately at least, in size, shape and appearance to the ordinary hickory shafts now in use; they must also be substantially the same in weight. It is therefore important that the metallic part of the shaft be limited to a certain extent in size in cross-section so as to keep down the weight, but it is of equal importance that the metallic part be of sufficient dimensions to afford the requisite strength.

In carrying my invention into effect I preferably employ a strand larger in one direction than the other in cross section, so as to form a piece in the nature of a ribbon, and I preferably give said strand a twist, or semicoil, which lends stiffness to the ultimate structure and serves better as a founda-

tion to support and retain the superimposed body, or mass, of papier mâché. In carrying my invention into effect, also, I have in view the fact that the papier mâché or other material employed shall not only serve as a means for filling out, or rounding out, the shaft, but it must also serve as a means for stiffening the metallic central part and lending tensile strength to the structure. It must be of such a nature, also, so that the entire weight of my improved shaft shall not be more than the weight of a wooden shaft of the same size.

For the purpose of more particularly describing my invention I will refer to the accompanying drawings forming a part of this specification, and in which—

Figure 1 represents a perspective view of the metallic part, or skeleton; Fig. 2 is a perspective view of a portion of the metallic part, skeleton or strand. In this figure also I show the edges of the strand turned over and lying at an angle relatively to the main body of the strand; the object of this is to provide means for locking the superimposed mass more securely on the strand; Fig. 3 shows a modification of this means of locking; here instead of the turned over edges, I show perforations in the body of the strands which serve a like purpose to the turned over edges, as will be explained; Fig. 4 is a perspective view of a completed pair of shafts, the metallic skeleton being shown in dotted lines. In the completed and finished shafts the skeleton is of course invisible; in this form the shafts and cross piece are made integral. Fig. 5 shows my invention applied to a whiffletree; Fig. 6 is a longitudinal section, also partly in elevation, to a larger scale, of a portion of the shaft made according to my present invention; Fig. 7 is a cross section of the same on the line 7—7 of Fig. 6; Fig. 8 is a cross section and perspective view showing a modification of my invention.

In these drawings, A represents a metallic strand which constitutes the skeleton of my improved shafts and it is preferably formed, as hereinbefore stated, of a fair grade of steel whereby in use it will endure the tensional strain required of it and also provide sufficient spring or resiliency, qualities which obtain in hickory wood and which it is the object of my invention to simulate.

Around the strand A I place the completing and enveloping body B. This envelop-

ing body is formed, as hereinbefore stated, of papier mâché or other suitable material, such as wood pulp, or strips of wood, or other material. It is intended to fit snugly over and
 5 around the centrally arranged strand and suitable pressure is employed to produce an intimate and enduring bond between the two materials. That is to say, it is the intent and purpose of my invention to so place and
 10 secure the enveloping and completing material upon the central metallic strand, or skeleton, that at all times and occasions during practical usage of the completed shafts, the bond and union between the two elements
 15 will be maintained in its original integrity, and that there will be no separation of one from the other and that each will cooperate with the other to produce an enduring structure subject, of course, to the usual wear and
 20 tear. In order to accomplish this result, I may, if necessary or desirable, employ hydraulic pressure to effect the desired end; other pressure may, however, be used.

For the better retention of the completing
 25 and enveloping body upon the central strand, core or skeleton, I provide turned-over edges C upon the said strand, which act as a lock upon the surrounding body B. That is to say, the turned-over edges C by reason of
 30 their extension reach into the mass of the surrounding body B and, by presenting an angle, perform the office of an anchor as the material is being pressed into position. It forms a pocket for the surrounding mass B
 35 and acts, as aforesaid, as a lock. I also show perforations D in the strand, through which the material B can be forced when under pressure. These perforations act as additional or substitute means for locking the
 40 surrounding body B in the strand, core or skeleton A: either one or the other form of locking devices may be employed, either singly or together.

When the material B has been firmly secured upon the strand or skeleton A, I provide an outer finish E, as shown in Figs. 6 and 7. This finish may be of paint or varnish; other substances which can be similarly applied will answer the purpose however.

50 The material employed by me in the surrounding body B is, as hereinbefore stated, preferably papier mâché or wood pulp, or some substance of that nature. In other words, I employ a material essentially fibrous
 55 in its nature and one which will lend itself to the conditions imposed and will be capable of receiving the pressure and of maintaining the conformation of the finished structure. By using a fibrous material tensile strength and
 60 continuity is secured.

At F I show a cross piece connecting the two sides of the shaft. This cross piece is formed like the shafts themselves of a centrally located and longitudinally arranged
 65 strand, core or skeleton around which the

fibrous material is placed, it being subjected to the same pressure as the shaft proper. In Fig. 1 I show the cross piece and the shafts made of three separate parts joined together by pins and in Fig. 4 I show them formed of a
 70 single piece of metal.

When the two side pieces and the cross piece are secured together, either as shown in Fig. 1 by pins G, or by being welded together, or otherwise formed integrally, that is to say,
 75 of one piece as shown in Fig. 4, I place a surrounding body or mass B thereon, the result being the finished article, as shown in said Fig. 4, of the pair of shafts and the cross piece formed preferably of a single piece and
 80 filled in.

It is the object and intention of my invention to dispose of the shafts as shown in Fig. 4, that is to say, the parts consisting of the two shafts and the cross piece being assembled and finished, as shown, so that they reach the consumer as a finished article.

In Fig. 5 I have shown a whiffletree made in a similar manner; and at Fig. 8 I show a strand with dove-tailed portions extending
 90 throughout its length.

In carrying my invention into effect also I may employ the terminals of the metallic strand or skeleton by extending them beyond the surrounding fibrous mass and utilizing them as metallic finishing pieces for the parts; to illustrate—I show in Fig. 1 terminals J which may act as part of the thill coupling, and in Fig. 5 I show the metallic strands A terminating at K in metallic end pieces
 100 which may serve as receptacles for the traces.

It must be understood that in carrying my invention into effect I so impress the material B upon the strand or core A that in the act of joining these two materials the surrounding material is brought into a more compact form than before the pressure is applied, the result being a hard and stiffened structure; at the same time owing to the fact that the strand is made of twisted steel there
 110 remains in the completed structure a certain amount of elasticity.

It will be seen that the bent or twisted metallic core presents a constantly varying plane in cross section, thereby giving great
 115 strength as well as the requisite elasticity.

Where in the claims I speak of a pair of shafts I include the two shafts proper and the piece which serves to connect them and which also forms a support for the whiffletree.

Having thus described my invention, the following is what I claim as new therein and desire to secure by Letters Patent:

1. The combination in a pair of shafts for
 125 vehicles, of a metallic core or strand extending centrally through said shafts and cross piece, with an enveloping and completing body of fibrous material.

2. A shaft for vehicles having a twisted
 130

metallic strand extending longitudinally thereof the same being filled, or rounded out, by papier mâché, or equivalent material.

3. A shaft for vehicles having a twisted
5 metallic strand acting as a core, or skeleton, filled, or rounded out, by papier mâché, or other suitable material, to simulate the appearance of the ordinary shaft, and means for locking the papier mâché, or other material employed, upon the said strand.
10

4. In a shaft for vehicles, a centrally located metallic strand, a stiffening and completing body surrounding same, and means consisting of perforations in the strand for
15 locking the completing body.

5. A pair of shafts for vehicles having a centrally located strand, core or skeleton ex-

tending through the shafts proper as well as through the cross piece which connects them, the said strand core or skeleton being formed 20 integrally in combination with an enveloping and completing body.

6. A pair of shafts for vehicles having an integrally formed and twisted strand extending centrally through the two shafts and the 25 connecting piece, in combination with an enveloping and completing body.

This specification signed and witnessed this 25th day of January, 1907.

FRANK S. HOWELLS.

Signed in the presence of—

HERBERT KNIGHT,
M. A. BARRETT.