J. M. TAYLOR.

GEAR MATERIAL.

APPLICATION FILED NOV. 1, 1921.

1,438,875. Patented Dec. 12, 1922.

Fig. 1.

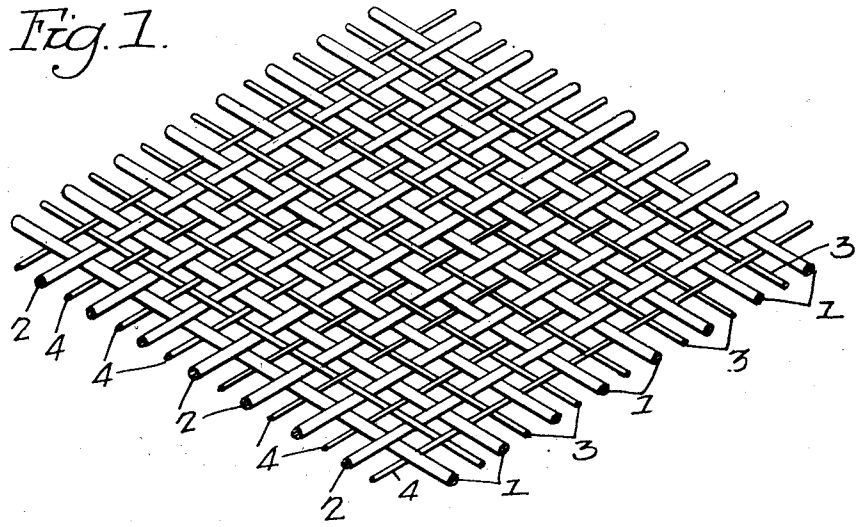


Fig. 2.

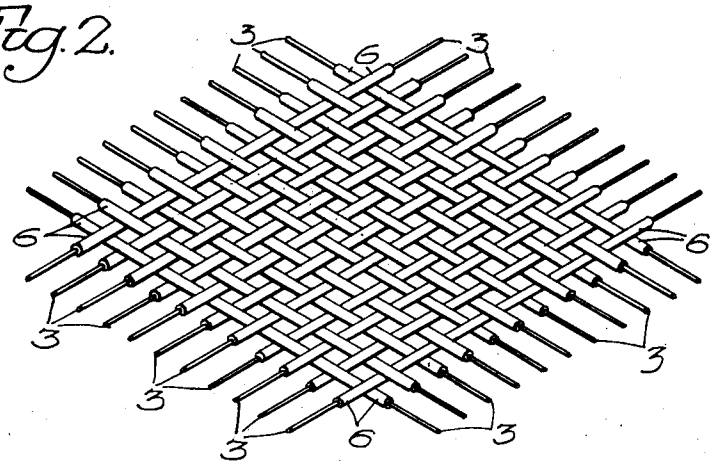


Fig. 3.



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UNITED STATES PATENT OFFICE.

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GEAR MATERIAL.

Application filed November 1, 1921. Serial No. 512,033.

To all whom it may concern:

Be it known that I, JOHN M. TAYLOR, a citizen of the United States, residing in Ardmore, Pennsylvania, have invented the Gear Material, of which the following is a specification.

One object of this invention is to provide a novel form of raw or base material particularly designed for use in the manufacture of mechanical elements such as gears or pulleys, and the invention especially contemplates a structure which shall be mechanically strong, waterproof, durable, shock resistant as well as of such a nature as to possess a relatively long life under conditions of use.

These objects and other advantageous ends I attain as hereinafter set forth, reference being had to the accompanying drawings, in which,

Fig. 1 is a diagrammatic, perspective view, illustrating a form of fabric of which my improved material may be made;

Fig. 2 is a perspective view similar to Fig. 1, illustrating a second form of fabric which I may employ; and

Fig. 3 is a vertical section of a gear, also to some extent diagrammatic, illustrating it as constructed in accordance with my invention.

Referring to Fig. 1 of the above drawings, I have illustrated a body of fabric made up of vegetable fibres such as cotton or linen threads 1–2 and thin metallic wires or threads 3–4. These two series of threads are woven together in any desired or suitable manner and the resulting fabric sheet after being parchmentized is saturated or impregnated with a phenolic condensation product such as the material known on the market as condensite, in accordance with the product described and claimed in Patent No. 1,236,460, dated August 14, 1917. Thereafter a pile or mass consisting of a number of similar fabric sheets containing the phenolic condensation product in its intermediate stage and preferably after having been dried, are subjected to heat and pressure in a suitable press for a length of time sufficient to cause said condensation product to assume its final infusible and insoluble condition. Obviously the time required will vary with the number of sheets being combined and I have found that a pressure of approximately one thousand pounds to the square inch at a temperature such as is produced by steam at one hundred pounds to the square inch, will give the desired results.

Under the above conditions, the condensation product saturating the vulcanized or parchmentized cotton or linen members 1 and 2, first becomes softened and thereafter becomes hard and horn-like, filling the spaces between the several threads as well as uniformly impregnating them and binding the several layers of fabric inseparably together so that the whole constitutes a plate, sheet or block such as is indicated diagrammatically in Fig. 3, in which the various threads 1–4 constituting the warp and weft of each layer, lie substantially parallel with the opposite and parallel faces of the block. The latter possess not only the mechanical strength and hardness due to the combination of the vulcanized cotton or linen threads and the solidified condensation product within and surrounding these, but is also made to possess increased strength and wear-resisting qualities by reason of the interwoven metallic elements 3 and 4.

If desired, I may in some cases make the fabric of interwoven threads or elements consisting as shown in Fig. 2 of metal wires or threads 3 individually covered with cotton or linen for example in the manner characterizing insulated electrical conductors. After the fabric sheets have been prepared of this material they are subjected to a vulcanizing or parchmentizing treatment and thereafter to a treatment whereby their cotton or linen coverings are saturated or impregnated with a phenolic condensation product such as above described.

A number of layers of this fabric containing the condensation product in its intermediate or soluble stage are then assembled and combined into a single plate or block as above described so that the several layers or laminations are inseparably connected, and the resulting finished product of impregnated and parchmentized cotton or linen with the reinforcing metallic elements, is available for use in the manufacture of gears, pulleys and other mechanical elements. The metallic threads or wires may be of copper, bronze, aluminum, steel, or other suitable metal and their size and number may be widely varied without departing from my invention. In any case they impart an increased structural strength to

the plate or block of which they form a part and serve to materially increase the life and wear-resisting qualities of the gear or pulley which may be manufactured from material made in accordance with my invention.

In some cases I may omit the vulcanizing or parchmentizing treatment of the constituent fabric layers or elements, in which case I saturate or impregnate the fabric with a condensation product in its intermediate stage and thereafter build up the several layers into a mass or pile which is subjected to heat and pressure for the time requisite to cause the condensation product to assume its final infusible and insoluble form.

As before, the finished product is a hard, strong, dense, water and oil-proof block or plate particularly adapted to resist wear and shocks.

I claim:

1. A material for use in the manufacture of mechanical elements consisting of a plate made up of a series of fabric laminations impregnated with a solidified condensation product and including interwoven metallic and vegetable threads.

2. A material for use in the manufacture of mechanical elements consisting of a block or plate composed of fabric laminations uniformly impregnated with a solidified phenolic condensation product, the fabric of each of the layers being made up of interwoven metallic and vegetable threads.

3. A material for use in the manufacture of mechanical elements consisting of a block or plate composed of fabric laminations uniformly impregnated with a solidified phenolic condensation product, the fabric of each of the layers being made up of interwoven metallic and vegetable fibres of which the latter have been parchmentized.

4. A material for use in the manufacture of mechanical elements consisting of a series of fabric layers bound together by a solidified phenolic condensation product and each consisting of interwoven cotton and metallic threads.

5. A material for use in the manufacture of mechanical elements consisting of a series of fabric layers bound together by a solidified phenolic condensation product and each consisting of interwoven cotton and metallic threads, of which the former have been vulcanized.

6. A plate or block for use in the manufacture of mechanical elements consisting of a series of laminations bound together by a solidified condensation product and each consisting of interwoven cotton covered wires.

7. A plate or block for use in the manufacture of mechanical elements consisting of a series of laminations bound together by a solidified condensation product and each consisting of interwoven cotton covered wires, the cotton covering on said wires being vulcanized.

8. A plate or block for use in the manufacture of mechanical elements consisting of a series of laminations bound together by a solidified condensation product and each consisting of interwoven cotton covered wires, the cotton covering on said wires being vulcanized and impregnated with the condensation product.

JOHN M. TAYLOR.