

# UNITED STATES PATENT OFFICE.

THOMAS H. DUNHAM, OF BOSTON, MASSACHUSETTS.

## IMPROVEMENT IN CORDAGE.

Specification forming part of Letters Patent No. **164,154**, dated June 8, 1875; application filed May 15, 1875.

*To all whom it may concern:*

Be it known that I, THOMAS H. DUNHAM, resident of the city of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Cordage; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawing and to the letters of reference marked thereon, which form a part of this specification.

My invention consists of a new article of thread or cordage formed from pulp or fibrous material, having metal ribbons, wire, and thread united with it by tar compound, and formed into a solid durable material, having fire and water proof qualities combined with great strength.

In rubber and twisted fibers attempts have been made to form substances for various uses, but they could not be used to advantage owing to the material used not being suited or adapted to the purpose. The action of the metal on rubber has a tendency to wear and cut, while it adds no strength to the metals. In twisted fibers, as used spirally, there is no strength given to the material, and every layer is separate, leaving a space between, which, when bending, opens out, and the more it is used, causes divisions, sliding on the metal when bending. As a cover it does not make a continuity or complete surface, while the expense is large as in rubber.

In the manufacture of cordage, especially where a heart is required, the usual way has been to put in a cheap coarse inside or heart, and the outside or the strand is formed with the core or heart as the rope is laid. Under this method the core or heart bears the strain. The strand or rope has a center, as in patent-made cordage, (under the English Huddart principle, as it is termed.) The strand or rope after being worn and untwisted shows the center or core to bear all the strain, and the outside is simply plated over.

In order to obviate the evils thus stated, under my process the heart or core of the material is the strongest, and will add to the strength of the material fifty per. cent., making cordage,

threads, bands, springs, tubing, hose, and belting, and other material requiring to be very strong and bear great strain, over the present use of material, while the expense is not increased, uniting in one entire body the metal and fiber, both giving strength and allowing for bending in any form without dividing the surface, while giving elasticity to the material.

In order to give a clearer understanding of the matter, I refer to the accompanying sheet of drawing, which shows a piece of cordage embodying my invention, and state the mode of manufacture more fully, as follows:

I use hemp, flax, cotton, jute, or other fibrous material in sliver or twisted form, as shown at *a*, combining with them plain or spiral metal thread, wire, or ribbon, as illustrated at *b*, longitudinally or lengthwise, uniting them on a draft or form, so as to bring the material together over the stretch, and in order to do so I form the combination through tubes fitted for the purpose of giving the size I require. The tubing presses the whole, or as it is drawn through forms it into a material that allows all to bear strain, and give the strength of the material combined; or it is formed by increasing the draft on the ordinary spinning, bringing all the pressure to bear that is needed, making the strain as equal as possible on the whole, and forming it solid, or in any other equivalent manner. I then run this material through a bath of tar boiled, and then add three pounds of rosin, five to seven pounds of tallow, and twenty to thirty pounds of clay, chalk, and whiting to every barrel of tar, sulphate of ammonia, salts of an alkali, chalk, whiting, baryta, infusorial salts, sulphur, ocher, combining the several materials in liquid form to give the material a compact solid body for wear and strength, combining water-proof and fire-proof qualities, preservative qualities from water, fire, or pressure and strain brought to bear upon the material when used.

I do not claim a cord or rope made of metallic wire and fibrous threads, twisted together to make up the strands to be twisted and laid together in the manner that ordinary cord is twisted and laid. In my cordage the metal and fibrous portions run together, and the interposition of the tar filling keeps the metal

threads from slipping or cutting into the fibrous part of the strand. The whole is protected against rot and corrosion. The strain on the rope bears equally on the metal and on the fibrous material, so that both must be broken at the same time. The rope has the elastic property due to a fibrous rope and the extra strength due to the metal threads.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

The improved cordage herein described, made by combining metal wires, threads, or

ribbons with fibrous strands, the two being laid together as in rope-making, and the interstices filled with tar or tar compound, whereby both the metal and fibrous strands will be covered by the tar compound, as described.

In testimony that I claim the foregoing as my own I hereby affix my signature in presence of two witnesses.

THOMAS H. DUNHAM.

Witnesses:

H. M. MARTIN,  
L. TOWLE.