J. STORY.

Telegraph Cable.

No. 53,700. Patented April 3, 1866.

Fig. 1.

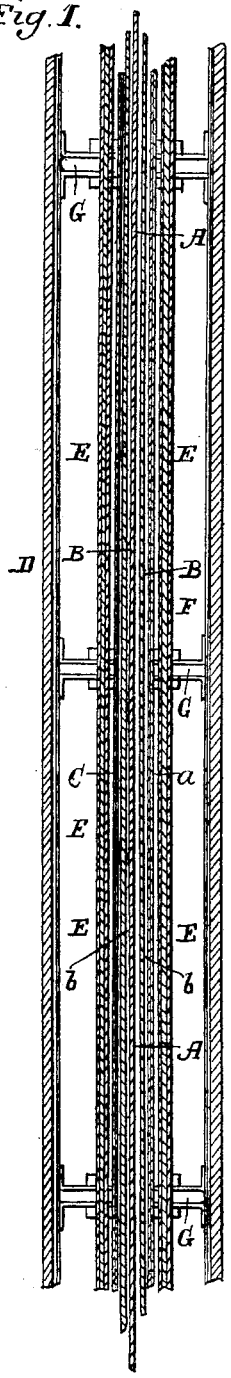


Fig. 3.

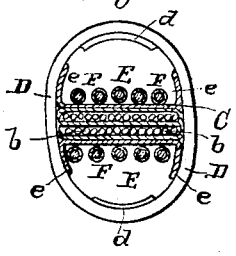


Fig. 4.

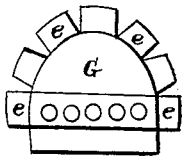


Fig. 5.

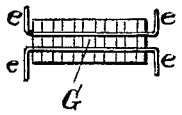
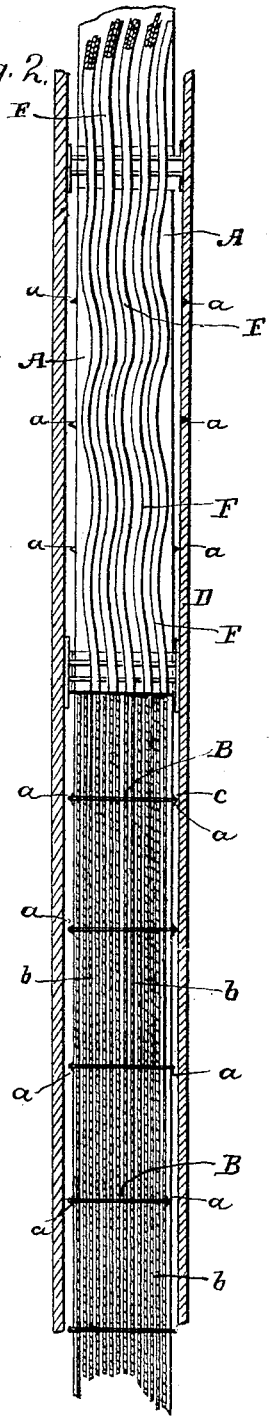


Fig. 2.



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UNITED STATES PATENT OFFICE.

JAMES STORY, OF PARIS, KENTUCKY.

IMPROVEMENT IN TELEGRAPH-CABLES.

Specification forming part of Letters Patent No. **53,700**, dated April 3, 1866.

To all whom it may concern:

Be it known that I, JAMES STORY, of Paris, in the county of Bourbon, in the State of Kentucky, have invented a certain new and useful Marine-Telegraph Cable; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 represents a longitudinal section of the cable, showing an edge view of the steel plate, the hemp cords, the casing for the same, the insulated wires, the partition-walls with their linings, the straps to support the covering over the air-chambers. Fig. 2 shows a longitudinal section of the same, with a side view of the steel plate with the projections on its edge, over which are shown the curved insulated wires at the top end. The lower end shows the hemp cord platted together and secured to the teeth on the edge of the steel plate. Fig. 3 shows an end view of the cable. Fig. 4 shows a detached view of partition-walls with their base and linings. Fig. 5 shows an edge view of the same.

The object of my invention is to construct a marine-telegraph cable that can support its own weight while being paid out from off shipboard—one in which the strength does not in the least depend on the insulated wires on which messages are transmitted.

My invention consists of having a steel plate of any desired width, with projections on its edge, and which is placed in the center of the cable, on each side of which are hemp cords platted together and secured to the projections of the steel plate, the same being so incased in gutta-percha as not to allow anything to attach or adhere to the hemp plat, the joint of the casing being cemented, so as to be water-tight.

My invention further consists in the manner of constructing the partition-walls and in the mode of securing them firmly in their places on each side of the covering that protects the hemp-cord plat and the steel plate, so as to form the base of strength to prevent the curved insulated wires from slipping or moving out of their places; also, in placing and securing elastic straps to the outer portion of the partition-walls, extending the entire length of the cable, for the purpose of cementing and forming a support for the outside covering over the air-chambers; and, furthermore, my invention consists in the application and mode of constructing air-chambers in sections in marine-telegraph cables, as hereinafter more fully described.

To enable others skilled in the art to construct and lay down my marine-telegraph cables, I will proceed to describe it more in detail, referring to the several figures in the drawings, and to the letters of reference marked thereon.

The same letters indicate the same parts in all of the figures.

I make the steel plate A A with projections on its edge *a a a a*, wrought up to its fullest capacity for strength and elasticity, to be the base of strength upon which the whole fabric is constructed.

On both sides of the steel plate A A, I place small cords *b b b b*, made of Russia hemp so tied together at intervals as to make a plat, B B, the width of the steel plate. In tying the cords *b b b b*, I form small loops *c c c c*, to fit over the teeth *a a a a* on projections on the edge of the steel plate at each tie, to secure the platted cords to both sides of the plate.

C C is a covering of prepared gutta-percha to cover the steel plate, and hemp platting to protect them from all moisture. Over the joint of the first covering C C is cemented a strip of gutta-percha, *d d*, which is of such width as to allow it to be cemented to the whole width of the casing C C, and also to the outside covering, D D at the sides. This is to give strength to the side covering, and, in the event that the projections should by any means become exposed, will prevent the conducting-wires from being affected. It is believed that a plat of hemp cords, made and applied as above stated, will be found to have from thirty to forty per cent. more strength than if the same number were twisted into a round cord or rope, for in such a cord the strain is always on the bow or outside of the curves, and the segment or the cramping of the short side adds much to the strain of the curve side; but in the platting of the cords the strain is on all parts alike, and should a breakage occur in the steel plate the cords, together with the casing and the outside cemented covering, will be of sufficient strength to hold the cable together and pro-

tect the conducting-wires from strain or injury in any way, while they will act as a safeguard to the cable. The hempen plat also acts as a non-conductor of electricity between the steel plate and the conducting-wires F F F. The steel plate A A in the center, held securely to its place by the outside covering, D D, and the hemp cords *b b b b*, with their ties and loops *c c c c* over the projections *a a a a*, will in turn hold all else attached to it smoothly and reliably in its place.

Any desired number of insulated conducting-wires, F F F, may have their support on each side of the casing C C in the partition-walls G G, they being so curved laterally as to take no part in forming the strength of the cable, and should be as small as possible to secure the end desired. Each wire must be covered separately with the best non-conductor of electricity and the surest protection against the action of the salt-water, so that, should there an accident occur to one, the others may remain perfect.

The partition-walls G G, which form the bearings and supports for the insulated wires F F F and divide the air-chambers E E into sections, may be placed at equal distances on both sides of the supporting base—say about three feet. The air-chambers may be longer or shorter, as experience may teach.

The conducting-wires, when placed in position, will be made to form small curves, so that when they are contracted the segments will conform to each other. The curves must be so slight that when placed upon the cable they would, if straightened out, be elongated in proportion of about one inch in three feet.

The partition-walls G are provided with linings *c c c c* on each side, which are somewhat larger than the diameter of the cable itself, so that they may be cemented to the casing *d d*, which covers the base or support, and also to the outside covering, D D, thus making each air-chamber E air and water tight. The object of curving or making the conducting-wires zigzag is to allow them to lay and move at ease, as the cable can only be curved two ways on finding the bottom of the ocean. If it has to conform to rocks or high projections, the curves on the one side may contract and the other be expanded, so as to suit the curves thus formed in the cable without strain or tension upon the conducting-wires, and the same effect will be produced when the cable finds rest in a low place, so that in any position the cable may assume there can be no strain or breakage of the conducting-wires.

The series of air-chambers E E, which are to extend the whole length of the route, are formed by the cross-bars or partition-walls G, their dimensions being in proportion to the width of the steel plate A A and the diameter of the whole cable, the air-chambers being on both sides opposite to each other, thus giving them a semicircular or an elliptical form. The material must be so thoroughly cemented to the wires and the covering of the hemp cords that no ordinary force can tear them off. The outside covering, D D, is put on in two pieces and is cemented to each edge of the casing of the steel plate and hemp plats, and also to the turned edges *d a e c*. It is composed of any good non-conducting material, and of sufficient width to turn up on each side and form the outer walls of the air-chambers by being cemented to the cross-bars or partition-walls G and their linings *c c*, thus forming a complete covering for the whole.

It will readily be seen that the air-chambers, as above described, will protect the conducting-wires, and will also act as buoys while paying out the cable by relieving it of much of its dead weight while finding its way to the bottom of the ocean. They will, to some extent, protect the wires from the attacks of marine animals and the influence of metallic substances. They give room for the wires to conform to places without the least pressure or strain upon them, and in case of a leakage it can go no farther than one chamber, and, as each wire is protected by its own covering and would still be protected from all else but the water in the one section, the injury would in all probability be slight. Still, if all of the wires were injured but an inch the cable would be lost; hence the importance of making the chambers with great care. They will also serve as cushions to protect the steel plate from being warped while being wound in coils or on spools for transportation and paying out, and will relieve the conducting-wires from the great weight and pressure of the cable upon them while lying on the spool, and will lessen the chances of their being injured in any way, and as the cable sinks in the water the air-chambers will be pressed equally on all sides, thus reducing the size of the cable and allowing it to settle easily to its resting-place on the bottom of the ocean with all of the vital working parts protected.

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

1. Constructing marine-telegraph cables with a steel plate provided with projections upon its edges for securing a platting of hemp cords, in the manner and for the purposes described.

2. The application and use of hemp cords or other equivalent substances, in combination with a steel plate, to support and take the tension off from the insulated conducting-wires in marine-telegraph cables.

3. The use of hemp cords in plats or other equivalent substances, in combination with a steel plate, when incased and the joints secured as herein described.

4. Supporting a series of curved conducting-wires in partition-walls placed in the cables at certain determined distances, and which

are constructed and secured in the manner herein described, for the purposes specified.

5. The elastic straps *e e*, the same being placed so as to give support to the outer covering, and secured to it and the partition-walls, in the manner and for the purposes described.

6. Providing a marine-telegraph cable with air-chambers constructed substantially as and for the purposes herein specified.

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Witnesses:
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