101411

PATENTED APR 5 1870

RICHARD M. BACHE. — ELASTIC SCALE

FIG. 1.

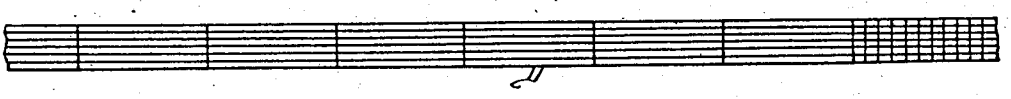


FIG. 2.

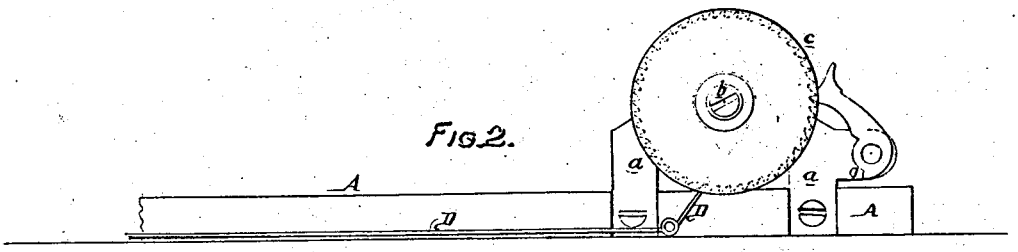
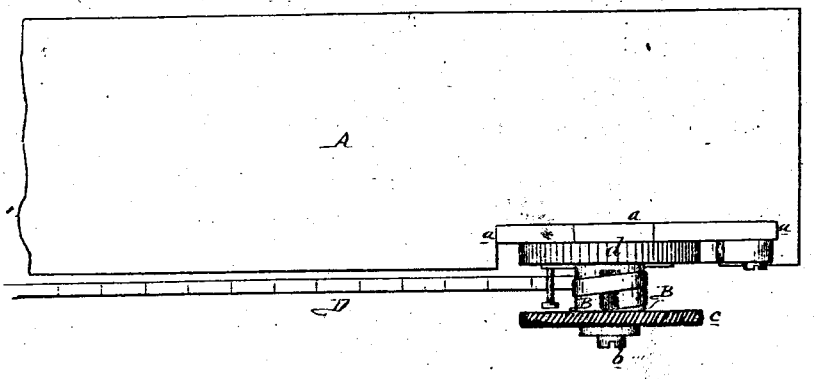


FIG. 3.



WITNESSES { Wm. A. Steel
John Parker

Richard M. Bache
by his Attys
Howson & Howson

United States Patent Office.

RICHARD MEADE BACHE, OF PHILADELPHIA, PENNSYLVANIA.

Letters Patent No. 101,411, *dated April* 5, 1870.

IMPROVEMENT IN ELASTIC GRADUATED SCALE.

The Schedule referred to in these Letters Patent and making part of the same.

I, RICHARD MEADE BACHE, of Philadelphia, county of Philadelphia, State of Pennsylvania, have invented an Elastic Scale, of which the following is a specification.

Nature and Object of the Invention.

My invention consists of an elastic graduated scale, composed of a number of strands of caoutchouc united substantially in the manner hereinafter described, so that when stretched the graduations of the scale are, for practical purposes, uniform throughout, and bear to each other the same relation as they do when partially or wholly relaxed, thereby rendering the scale serviceable in various useful arts and manufactures.

Description of the Accompanying Drawing.

Figure 1 represents a piece of my elastic scale (magnified three times its actual width.)

Figure 2, an elevation of part of an instrument, exhibiting one of the numerous applications of my invention; and

Figure 3, a plan view of fig. 2.

General Description.

I have discovered that the fabric known as elastic rubber braid, or elastic webbing or tape, possesses the property of stretching and relaxing uniformly, or very nearly so, throughout, and, therefore, is especially applicable to scales requiring the quality of proportional extension and contraction.

If, for instance, a piece of elastic braid, say an eighth of an inch wide and six inches long, composed of, say, six strands of caoutchouc, as shown in fig. 1, be marked with graduation, say, at intervals of a quarter of an inch, and be stretched to the extent of half its length, it will be found that the graduations have become three-eighths of an inch apart, or, in other words, the braid has stretched uniformly throughout, and, if the said braid be still farther stretched or be relaxed, it will be found to work uniformly.

This uniformity in the stretching and relaxing of the fabric I ascribe to the fact that it is composed of a number of strands of caoutchouc inclosed by a web of silk, cotton, or linen threads. Although the material of the strands cannot be perfectly homogeneous, nor any two of them identical in size or form, yet, by the principle of compensation, the imperfections of one strand practically counteract those of the other, and hence the strands, when united, are in the aggregate uniform, and possess the capability of equal, or nearly equal, proportional extension and contraction at all points.

The uniformity of the graduations when the braid is stretched or relaxed, depends, in a measure, upon the quality of the manufacture.

In experimenting for elastic scales for the use of tailors, I have found that the requisite accuracy can be obtained with an elastic tape three-eighths of an inch wide.

In making an elastic scale for plotting the work of that branch of surveying known as hydrography, (and I have applied my invention to it with success,) I use a finer material than that just mentioned, consisting of a flat braid about an eight of an inch wide and composed of six strands inclosed in a web of fine thread.

I have presented in the accompanying illustration the drawing of an instrument devised for aid in applying my invention to hydrography.

Near each end of a flat strip, A, of well-seasoned wood, is secured a standard, *a*, from which projects a spindle, B, and on the latter a drum, *b*, is arranged to revolve freely, one flange *c* of this drum being milled on the edge so as to facilitate its manipulations, and the other flange being ratcheted so as to receive the pawl loosely hung on the standard *a*. As the ends of this instrument are alike, it has not been deemed necessary to exhibit in the drawing more than one end.

One end of the graduated elastic scale is attached to the drum at one end of the instrument, and the other end to the drum at the opposite end of the instrument, the intermediate part passing downward from the drums and around pins projecting from the edge of the strip A, so that, when the scale is applied to a map, it shall be in contact, or very nearly in contact, therewith.

By manipulating the milled flanges *c* of either of the drums, the elastic scale can by stretching, or relaxing it, be adjusted to any desired position.

Those who are familiar with hydrography, will, from the preceding explanation, readily understand the mode of applying my invention to the plotting of soundings.

I wish it to be understood, however, that in exhibiting the drawing of an instrument for applying my invention to a certain use, I have no intention to here claim that or any other instrument, as the method of applying my invention will depend in a great measure on the art or manufacture to which it has to be adapted, and in many cases my elastic scale may be employed without the aid of any instrument whatever.

I have alluded to the aid which my invention will render to tailors or cutters of garments, and to hydrographers, but it must be evident that its application is not limited to them, but may be extended to various artisans and manufacturers.

Claim.

A graduated braid, webbing or tape, composed of a number of strands of caoutchouc united substantially in the maner hereinbefore described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

RICHARD MEADE BACHE.

Witnesses:

JOHN WHITE,

HARRY SMITH.