H. E. BROWN.

EXPERIMENTAL TRUSS UNIT.

APPLICATION FILED FEB. 25, 1921.

1,393,007.

Patented Oct. 11, 1921.

2 SHEETS—SHEET 1.

Fig. 1.

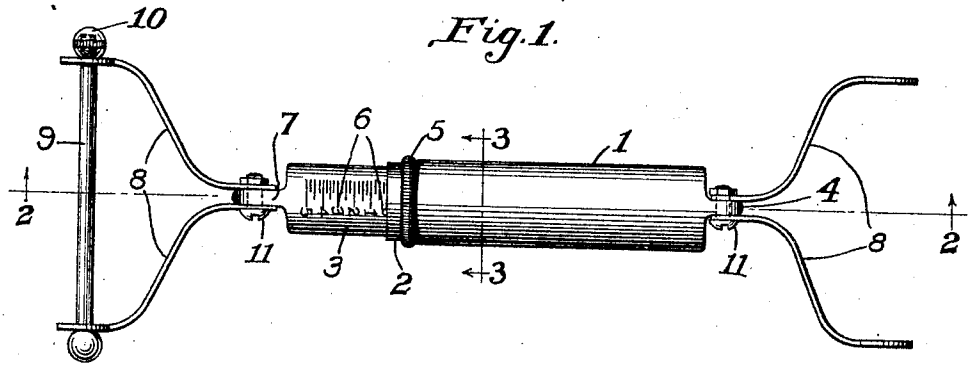
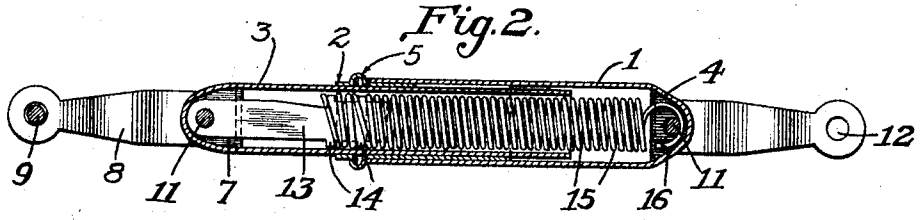


Fig. 2.



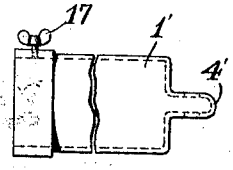
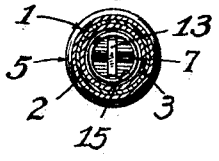


Fig. 8.

Fig. 3.



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2 SHEETS—SHEET 2.

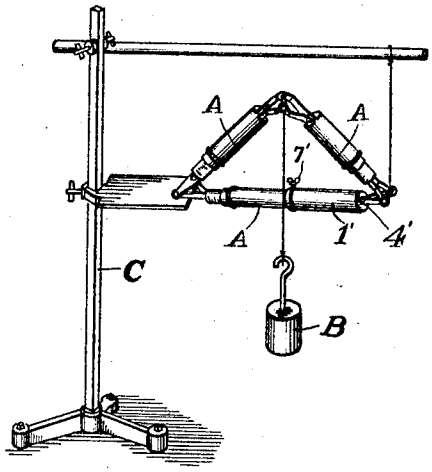


Fig. 4.

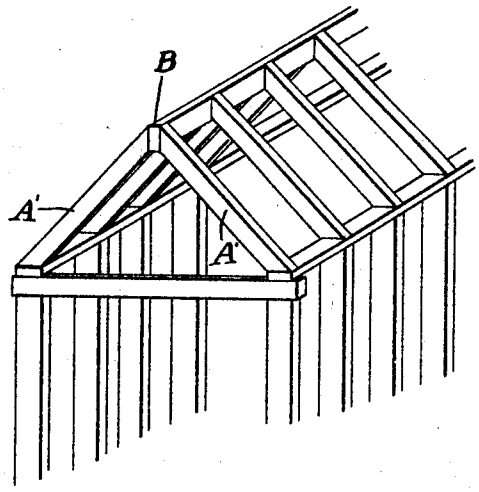


Fig. 5.

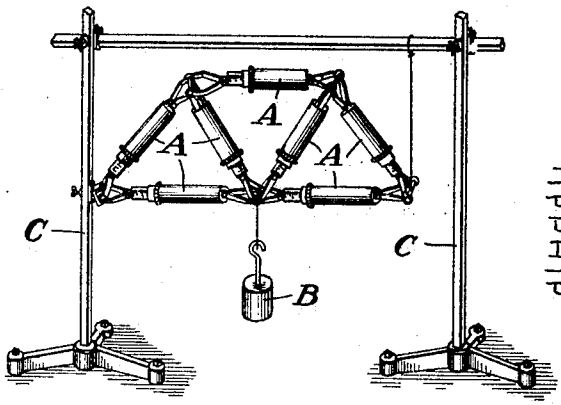


Fig. 6.

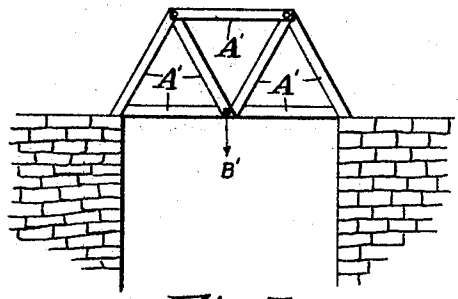


Fig. 7.

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EXPERIMENTAL TRUSS UNIT.

1,393,007. Specification of Letters Patent. Patented Oct. 11, 1921.

Application filed February 25, 1921. Serial No. 447,644.

To all whom it may concern:

Be it known that I, HUGH E. BROWN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Experimental Truss Units; and do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to experimental devices and more particularly to an experimental truss unit.

The object of the invention is to provide a simple, easily adjustable, interchangeable device having means for indicating the longitudinal tension or pressure to which it is subjected.

The invention consists in the novel structure, arrangement and combination of parts hereinafter more particularly described and claimed.

Two sheets of drawings accompany this specification as part thereof in which like reference characters denote like parts throughout.

Figure 1 is a plan view of the improved truss unit.

Fig. 2 is a vertical section taken on the line 2—2.

Fig. 3 is a transverse sectional view taken on line 3—3.

Fig. 4 illustrates the use of three of the improved truss units to demonstrate the strains to which structural parts are subjected in structures such as are illustrated in Fig. 5.

Fig. 6 illustrates a plurality of the improved truss units combined to demonstrate the strains to which structural elements are subjected in a structure such as is illustrated in Fig. 7.

Fig. 8 shows an auxiliary extension member.

Referring to the drawings, the device consists generally of a tubular member 1 within which is slidably fitted tubular adjustment member 2, within which is telescopically fitted tubular member 3. The opposed ends of tubular members 1 and 3 are closed by being compressed into relatively flat hollow transverse members 4 and 7 respectively. A spiral spring 15 capable both of expansion and compression is secured within the members 1 and 3 having one end secured by a bolt 11 within the transverse part 4 of tube 1 and having its other end secured to a connecting member 13 which is in turn pivoted by a bolt 11 within the transverse member 7 of the tube 3. On the outer face of tubular member 3 are marked graduations adapted to indicate in connection with the end of tubular member 2 which slides with tubular member 1 upon member 3, the amount of force applied either to compress or to extend the spiral spring 15. Connecting arms 8, two for each end, are provided and adapted to be held in rigid contact with the outer faces of reduced parts 4 and 7 respectively by means of bolts 11. These connecting arms are preferably bent so that their outer ends are in parallel planes and substantially spaced one from the other so as to avoid twisting of the device. Perforations 12 are provided in these outer parallel ends through which connecting pins 9 having threaded caps 10 are adapted to pass.

Where it is desired to use a truss unit to connect two points at a greater distance apart than its length, the auxiliary part illustrated in Fig. 8 may be utilized. This auxiliary consists of a part 1′ closely corresponding in shape to that of tubular member 1 but sufficiently large to slide over it. It is provided with a contracted perforated end 4′ and a set screw 17 which may be tightened to secure it at any desired point of extension.

The application of the device to experimental demonstrations will be readily apparent on observation of Figs. 4–5 and 6–7. In the former of these illustrations, it being desired to demonstrate the stress to which timbers A′ are subjected, the three experimental truss members A, A, A, are connected by means of their connection arms 8, as indicated in Fig. 4, and a weight B is applied. The compressive force to which each of these experimental truss members is subjected will be indicated by each member and will bear the same ratio to the weight B that the timbers A′ will support when subjected to a corresponding weight B′ applied in the actual structure. In the same way the stresses or strains to which the structural elements of the more elaborate bridge structure illustrated in Fig. 7 is subjected may be similarly illustrated by the combination of a suitable number of the experimental

truss units as illustrated in Fig. 6. Obviously these units may also be used for demonstrating the strains and stresses of derricks and other structures and permit a quantitative solution of a great variety of problems.

In the demonstrations any suitable supporting means for the truss units may be used, such as the tripod standards C here illustrated.

Having thus described my invention, I claim:

1. An experimental truss unit comprising a combined compression and expansion member, means for indicating the longitudinal stress, either compressive or expansive, to which said member is subjected, and hinge means carried by each end of said member.

2. An experimental truss unit comprising telescoping cylindrical members in sliding relation, a combined compression and expansion coil spring having its ends connected to the outermost ends of said members, a scale marked on the outer face of the inner member adapted to pass under the outer, and hinge means secured to the outer end of each member, said hinges having spaced bearing arms and movable pins.

3. A device for demonstrating stresses and strains comprising, in combination, a suitable supporting means, a plurality of interchangeable, interlocking combined compression and expansion indicating members each as specified in claim 1.

4. In combination with an experimental truss unit as specified in claim 1, an extension member adapted to telescope said truss unit and having means for securing it in fixed relation thereto as desired.

In testimony whereof I affix my signature.

HUGH E. BROWN.