(No Model.)

B. E. SPERRY.

TRANSVERSE TESTING MACHINE.

No. 568,417. Patented Sept. 29, 1896.

Fig. 1.

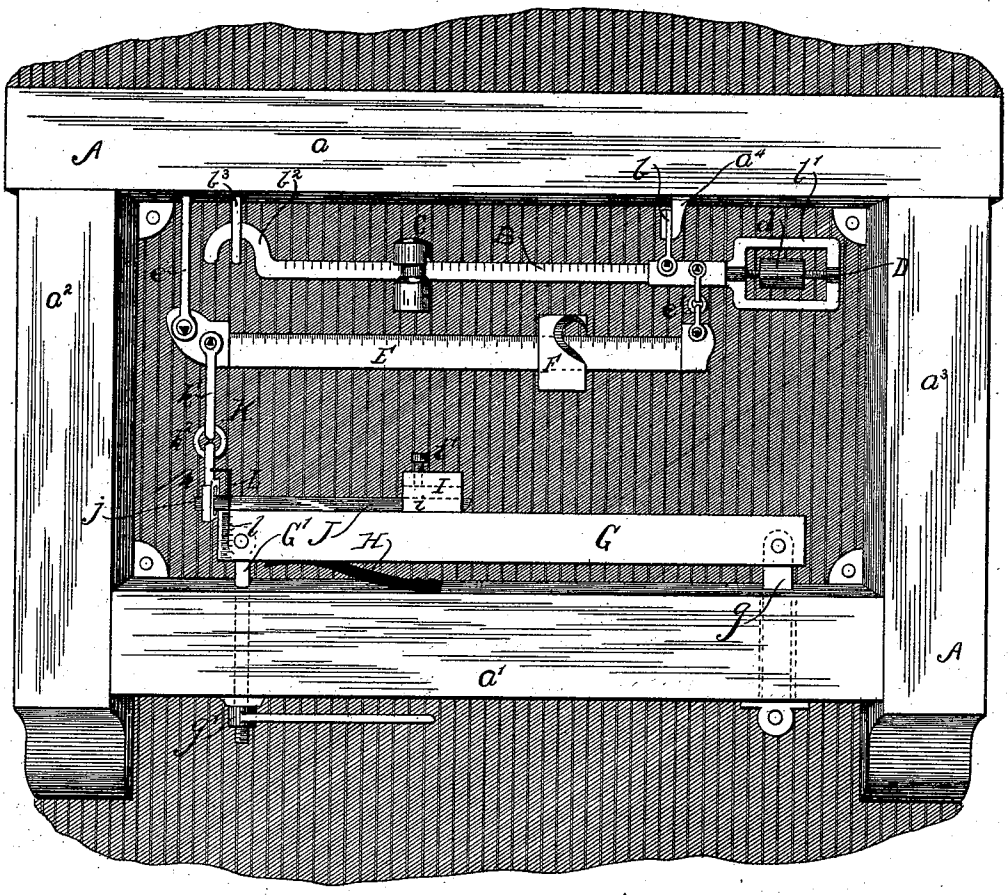


Fig. 2.

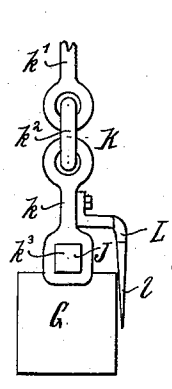
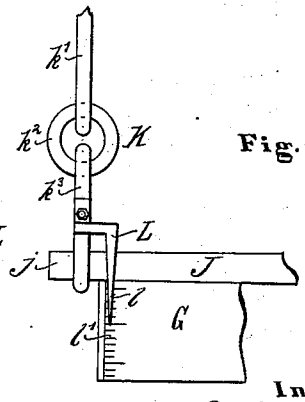


Fig. 3.



Witnesses
C. F. Blake
A. A. Murray

Inventor
Barton E. Sperry.

By Osborn & Thacher

Attys.

UNITED STATES PATENT OFFICE.

BARTON E. SPERRY, OF BATAVIA, ILLINOIS.

TRANSVERSE TESTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 568,417, dated September 29, 1896.

Application filed July 9, 1895. Serial No. 555,392. (No model.)

To all whom it may concern:

Be it known that I, BARTON E. SPERRY, a citizen of the United States, residing at Batavia, in the county of Kane and State of Illinois, have invented certain new and useful Improvements in Transverse Testing-Machines, which are fully set forth in the following specification, reference being had to the accompanying drawings, in which—

Figure 1 represents a front elevation of a testing-machine embodying my invention; Fig. 2, a detail end elevation of the bed-bar with metal rod thereon to be tested, part of link connection to said bar, and an indicating-finger fixed thereto; and Fig. 3, a side elevation of the parts shown in Fig. 2.

In the drawings, Fig. 1 is upon one scale and Figs. 2 and 3 are upon another and enlarged scale.

My invention relates to that class of machines used for testing the transverse strength of metal bars. By my improvement I secure the bar to be tested rigidly at one end in a suitable clamping device and connect the opposite end to scale-beams or other suitable implement for registering in pounds and fractions of pounds the force applied to break the bar. I have also a registering attachment attached thereto whereby the degree of deflection of the bar before breaking is registered.

My invention consists of the devices and combination of devices hereinafter described, and made the subject-matter of the claims.

In the drawings, A represents a rectangular frame of the old well-known construction, consisting of upper beam a, lower beam a', and end beams a^2 a^3. An upper scale-beam B is suspended in the usual way by loop-link b from the under side of the upper beam a by means of a bracket-hook a^4, depending from said beam near one end thereof. The short arm of this scale-beam projects nearly across the narrower space between the link-support and the side of the main frame and terminates in a rectangular loop b'. The other or longer end extends in the opposite direction from this support and terminates, preferably, in a bend or hook b^2, which passes into a loop b^3, depending from the upper frame-beam and of sufficient length to permit a considerable vertical movement of the scale-beam. This upper scale-beam is graduated as usual, and a weight C is mounted thereon and capable of sliding back and forth for the usual purpose. In the loop b' there is fixed a horizontal threaded rod D, on which is mounted a balancing-weight d to adjust the scale-beam to normal level position in the usual way when at rest. A second scale-beam E is suspended below the first, being hung at one end by a supporting-loop e, secured to the upper beam of the main frame and depending therefrom. This support is a little outside the hook end of the upper scale-beam, and at the other end the scale-beam E is connected to the upper beam by a link device e', this connection being between the link-support of the upper scale-beam and the loop for the balancing-weight. The lower beam is graduated, but with a finer rate of indication than the upper one, and a weight F is mounted thereon, being movable back and forth. Below these scale-beams an angular bar G is mounted on the lower beam a' of the main frame, being nearly as long as the space between the end beams of said frame. This bar is of metal or any other suitable material and at one end is supported by an upright rod g, secured in the lower beam of the main frame and projecting a little above it, this upper end being underneath the loop at the end of the upper scale-beam. The other end of this bar G is also secured to the same beam of the main frame, but by a somewhat different device. A rod G′ is hinged or pivoted at its upper end to the bar about underneath the guide-loop for the hook end of the upper scale-beam. This rod is set loosely in a suitable aperture passing down through the lower frame-beam and at its lower end projects somewhat beyond the beam. This lower end is threaded, and there is fitted upon it a nut g', provided with a handle, by means of which it is turned to adjust the position of this sliding rod. Near the end of the bar to which this sliding rod is pivoted a spring H is secured at one end to the lower frame-beam and extended outward with a bend upward from this fastening-point underneath the bar G, being so regulated with reference to the latter that its tension will always act to hold up this end of the bar as far as the nut on the lower end of the rod G′ will permit, the nut being of course adjustable on this threaded

end of the rod. On the upper face of the bar G there is a kind of bracket I, either fixed on the bar or made in one piece therewith. As seen in the drawings, this device is about over the fixed end of the spring, but there is no limitation to this particular arrangement. This bracket is provided with an aperture or channel *i*, passing through it lengthwise and cut down even with the upper face of the bar G. A binding or set screw *i'* is set in the upper face of the bracket by means of a threaded aperture passing down into the channel below. This channel is adapted to receive one end of any rod or bar, the power of which rod or bar to resist transverse strain it is the purpose of this machine to test. The rear end of this bar is slipped back through the channel and is securely fastened in this position by the binding-screw above. The rod extends outward from this point without other fastening, lying normally flat on the upper face of the bar G, and its outer end *j* projects a little beyond the end of the latter. A link device K is provided to connect this projecting end of the rod J to the lower scale-beam at a point just within the pivotal end support of the latter. This connection consists of a lower member *k* and an upper member *k'*, united by a link ring k^2. The lower member is enlarged at its lower free end and is provided with an aperture k^3, adapted to receive the projecting end of the bar to be tested. The upper member *k'* is a loop open at one end, embracing the lower scale-beam and set upon bearings thereon a little inside its supporting-bearing. It will be understood that all of these bearings on the scale-beams are of the ordinary triangular shape to provide an edge bearing, well known in scales.

There is also provided a device for indicating the deflection or elasticity of the rod tested. It consists of a small pointer L, made in substantially right-angular form, the horizontal section of which is secured to the lower member *k* of the link K. This section projects outward from its connection and then downward, making a second section depending from the first at substantially a right angle and extending downward along the front side of the bar G close to the end thereof below the rod to be tested. As shown in the drawings, this depending section *l* is tapering, though this is not an absolute essential. A graduated scale *l'* is made on the bar G at the extremity thereof and arranged vertically immediately within or opposite the depending section *l* of the pointer. This scale is graduated to indicate the deflection or elasticity of the rod tested, being graduated from zero upward.

The operation of this testing-machine is as follows: The rod to be tested is placed in position in the channeled clip or bracket *i* and securely fixed in this position by the set-screw *i'* or any other suitable device, and the perforated lower end of the link-connecting device K is connected to the projecting end of the rod by passing the aperture at the lower end of the link connection over the projecting end of the rod. The nut or other adjusting device on the lower end of the sliding rod G' is then moved in a direction to draw the said sliding rod downward to a point where all loose motion in the various loops in the machine is taken up. The weight C on the scale-beam B is then placed approximately at the point which would indicate the power required to break the bar or rod J. The operation of the ratchet-nut *g'* is then continued. When the power is sufficient to raise the beam B, then the weight F is gradually moved along on the beam E from right to left of the beam, as shown in the drawings, starting at the extreme right-hand end of the beam E, which is the zero-point for that beam, to keep that beam just balanced with the force applied to the bar J, so that when the bar J breaks the reading of the power applied is made on the scale-beam B and on the scale-beam E. The position of the pointer L will at the same moment indicate on the deflection or elastic scale the deflection or elasticity of the rod tested, this last indication being noted instantly by the attendant.

There may be modifications in the special mechanical devices here shown and described without losing the controlling features of the invention, and such changes are contemplated in the practical use of the structure, provided its controlling principle of operation is retained.

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

1. In a transverse testing-machine, an apparatus for registering the power required to break the bar which is tested; a clamping device adapted to clamp one end of said rod or bar; a pivoted rod or link connected to the registering device and adapted to receive the free end of the rod or bar to be tested; and suitable apparatus for vibrating the clamping mechanism which is adapted to clamp one end of the bar or rod which is to be tested; whereby the power to break the rod is applied to one end of the bar or rod to be tested, while the other end is connected to a registering device that registers the force required to break the rod.

2. In a transverse testing-machine, the clamping device for clamping one end of the rod to be tested; apparatus for connecting the other end of said rod with the registering device for registering the transverse power required to break the rod; and a registering device attached to the apparatus to register the transverse or bending deflection of said rod or bar before it breaks.

3. In a transverse testing-machine, a pair of scale-beams mounted within a suitable frame, in combination with a supporting-bar, G, pivoted at one end to a fixed support set in the lower beam of the main frame and at the other to the upper end of a sliding, adjustable

support G′, a spring, H, applied to the vertically-movable end of the bar to hold it up normally, and a link device, K, having an aperture, k^3, at its lower end to receive the projecting end of the rod, and at its upper end pivoted to the lower scale-beam inside its supporting pivotal bearings, substantially as described.

4. In a transverse testing-machine, a main frame, in combination with two scale-beams pivotally mounted and connected together within said frame, a supplemental supporting-bar, G, mounted on the lower beam, a', of the main frame by a fixed journal-support, g, at one end and at the other end to a like support, g', mounted loosely in said frame-beam and movable vertically therein, a device applied to the lower end of the sliding support g', to draw it downward, an adjusting-spring, H, fastened at one end to the lower beam of the main frame and having its outer end free, bent upward and resting against the under side of the bar G, just inside its movable support, a channeled bracket on the upper face of the bar G, a link connection, K, composed of two members, k, k', loosely connected together, the lower member k, having an opening adapted to receive the projecting end of the rod, and the upper one, k', forked at its upper end and connected in the usual way by edge journal-bearings to the lower scale-beam inside its pivotal support, and sliding weights, C, and F, mounted on the respective scale-beams, substantially as described.

5. In a transverse testing-machine, a pair of scale-beams, B, and E, mounted within the frame and connected in the usual way, a supplemental bar, G, mounted upon the lower beam of the main frame and having a vertical deflection graduation, l, at one end, a link device, K, constructed at one end to take the projecting end of the rod and at the other pivotally mounted on edge bearings on the lower scale-beam, and a bent pointer, L, secured at one end to the lower member of the said connecting-joint and having the other end bent outward at a right angle and extending along the vertical deflection graduation at the end of the supplemental bar, substantially as described.

BARTON E. SPERRY.

Witnesses:
WINIFRED S. LONG,
E. C. BROWN.