

(No Model.)

S. JUMP.

TENSILE STRAIN TESTING MACHINE.

No. 404,200.

Patented May 28, 1889.

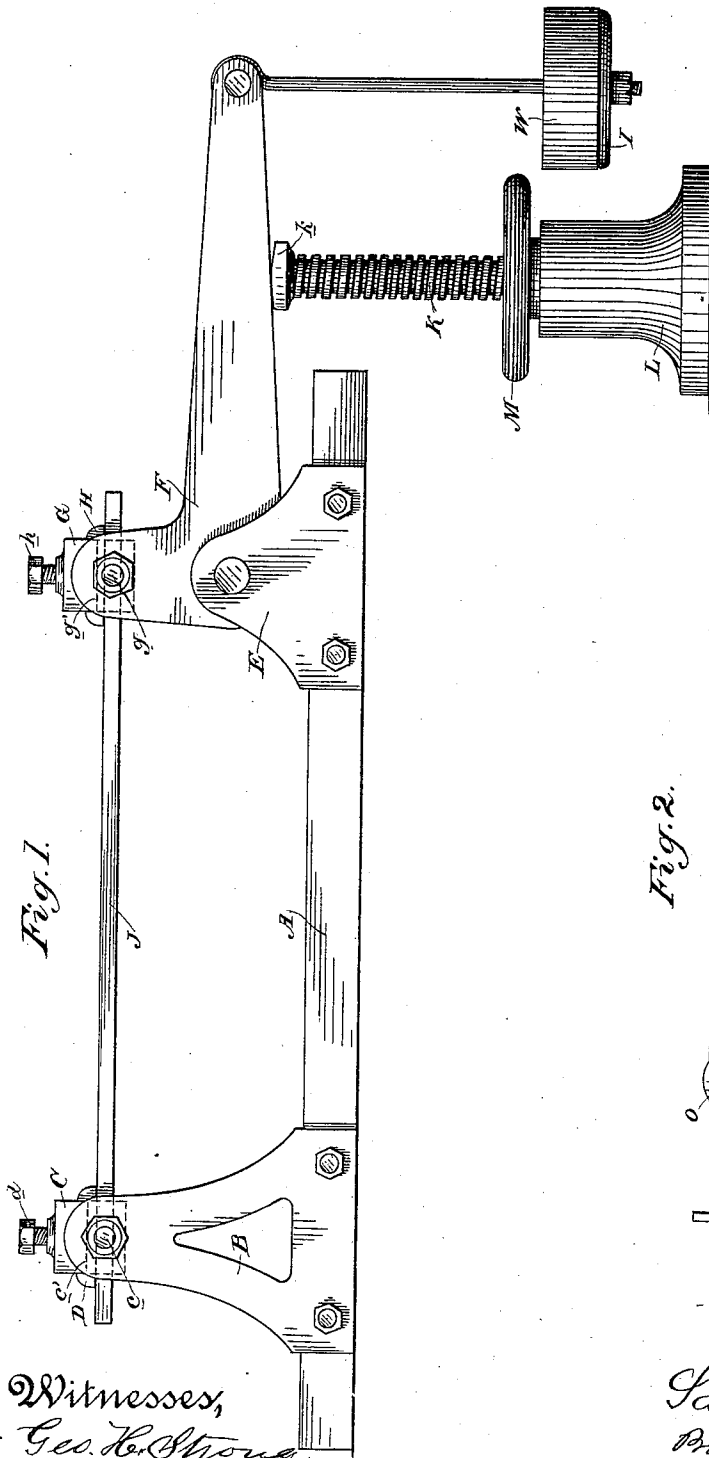
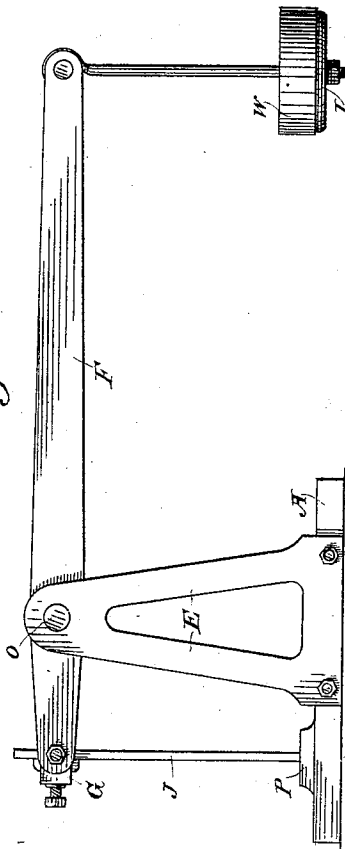


Fig. 1.

Fig. 2.



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UNITED STATES PATENT OFFICE.

SAMUEL JUMP, OF SAN FRANCISCO, CALIFORNIA.

TENSILE-STRAIN-TESTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 404,200, dated May 28, 1889.

Application filed February 6, 1889. Serial No. 298,892. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL JUMP, of the city and county of San Francisco, State of California, have invented an Improvement in Tensile-Strain-Testing Machines; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to the class of testing-machines; and my invention consists in the novel arrangement and combination of parts hereinafter described, and particularly pointed out in the claims.

The object of my invention is to simply and accurately arrive at the strength of any material by dead-weight. Its uses are, primarily, for testing by such strain the strength of metallic substances—such as iron or steel bars, wire, springs, spring-balances, and ropes, whether vegetable or metallic—it being also applicable to organic substances, all of which can be tested more accurately than by the known hydraulic appliances with less liability to error in calculating the results, the dead-weight system removing it practically beyond errors.

Referring to the accompanying drawings for a more complete explanation of my invention, Figure 1 is a side elevation of my machine. Fig. 2 is a modification of the same.

A is a bed, to which, near one end, is bolted the upright bracket B, consisting of two separated parts, between the tops of which is mounted the rocking cross-head C, which carries the clamp. This cross-head has on its sides the pivot-pins *c*, which are journaled in the top of the bracket sides, so that it may rock on its pivotal centers. Through the cross-head is made an aperture, *c'*, in which is fitted the clamp D, adapted to be operated by a set-screw, *d*. Near the other end of the bed A is bolted an upright bracket, E, between the sides of which at the top is pivoted the elbow or bell-crank lever F. In the top of the upright or short arm of this lever is mounted the rocking cross-head G, with pivot-pins *g* and receiving-aperture *g'*. In the cross-head is the clamp H and the operating set-screw *h*, the whole being adapted to operate in a manner similar to the corresponding parts in the bracket B.

To the horizontal or long arm of the lever is connected the pendant I, on which the weights W are carried.

J is the bar to be tested. Its ends are passed through the apertures in the rocking cross-heads C and G and are bound therein by the clamps D and H, which are forced down upon it by their respective set-screws. Weights are then successively placed upon the pendant I until the bar is fractured or has borne the required amount of strain. The rocking cross-heads by their movement conform to the changing position of the lever and thereby accommodate themselves to the bar being tested in whatever position it may be drawn or placed.

K is a screw having a head, *k*, and mounted at its lower end in a fixed stand, L, the screw being operated by a hand-nut, M, in the usual manner of a lifting-jack or screw. This screw is placed in position directly under the long arm of the lever F, and as said arm comes down under the increasing weights placed upon its pendant the screw is run down by hand to lie just under it without supporting it. When the bar is fractured, the lever, instead of falling with suddenness, is received almost immediately upon the head of the screw, and injury to the machine is thereby prevented.

In Fig. 2 I show a slight modification of my machine, in which the power-lever, instead of being of an elbow or bell-crank shape, is straight. Its fulcrum-pin (represented at O) is nearer one end than the other, thereby giving the necessary leverage. The bar to be tested is placed in a vertical position, its lower end being held firmly down by a suitable fixed clamp or grip, as at P, and its upper end being connected with the short arm of the lever by a clamp in a rocking cross-head mounted in the end of the lever in the same manner and for the same purpose as the cross-heads heretofore described in connection with Fig. 1. The weights are hung from the long arm of the lever, and as they are put on, the strain on the bar increases until it either fractures or has sustained the required strain. This modified construction will preferably be employed in heavy work for breaking vertically.

In using the machine two fixed centers must be taken on the piece to be tested by a "trammel." Its exact measurements having been ascertained, it is submitted to the strain of the machine, weights being added until it is

broken, when the elongation is determined by the two fractured parts being put together, and another mark given by the trammel denotes the elongation.

5 Contraction of area is arrived at by measuring the fractured ends. The result is positive accuracy, and the tests can be made as easily as weighing articles on any platform or lever machine.

10 I am aware that testing-machines are known which operate by means of dead-weight acting through suitable levers, and I do not therefore claim such, broadly; but

What I do claim as new, and desire to secure by Letters Patent, is—

15 1. In a testing-machine, the combination of the upright bracket B, having in its top the pivoted or rocking cross-head, with adjustable clamp for receiving and holding one end of
20 the bar to be tested, the fixed bracket E, and pivoted elbow or bell-crank lever in said bracket and having one end adapted to re-

ceive the testing-weights, and the rocking cross-head in the other end of said lever and having an adjustable clamp for receiving and
25 holding the other end of the bar to be tested, substantially as described.

2. In a testing-machine, the fixed brackets B and E, the rocking cross-head with clamp carried by bracket B, the elbow or bell-crank
30 lever pivoted in bracket E and having one end adapted to receive the testing-weights, and the rocking cross-head with clamp in the other end of the lever, in combination with the vertically-movable or adjustable support
35 K under the lever and adapted to receive it instantly when the bar to be tested is fractured, substantially as described.

In witness whereof I have hereunto set my hand.

SAMUEL JUMP.

Witnesses:

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J. H. BLOOD.