(No Model.) 2 Sheets—Sheet 1.

T. D. WEST.

TESTING MACHINE.

No. 340,842. Patented Apr. 27, 1886.

Fig. 1.

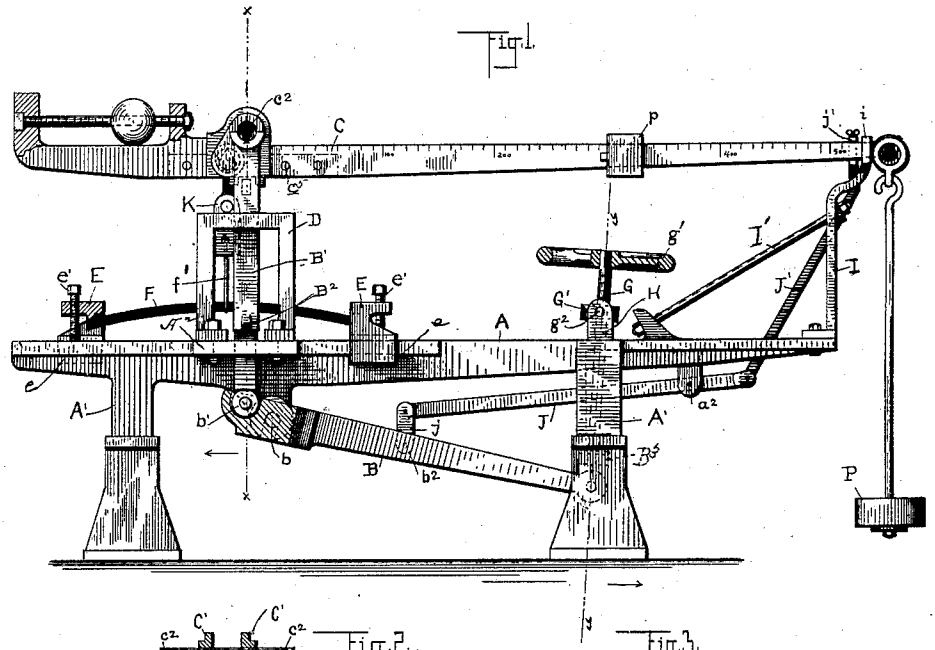


Fig. 2.

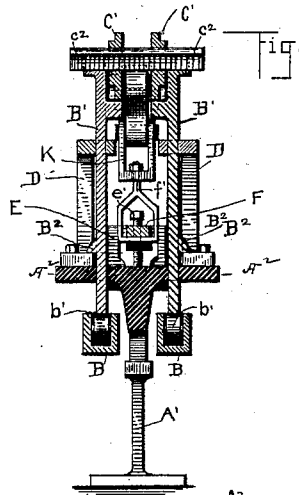


Fig. 3.

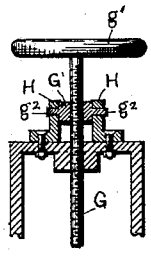


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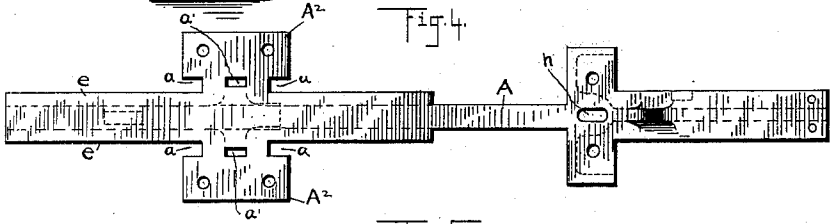
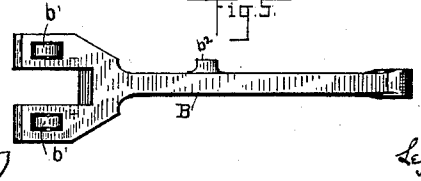


Fig. 5.



WITNESSES
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(No Model.) 2 Sheets—Sheet 2.

T. D. WEST.

TESTING MACHINE.

No. 340,842. Patented Apr. 27, 1886.

Fig. 6.

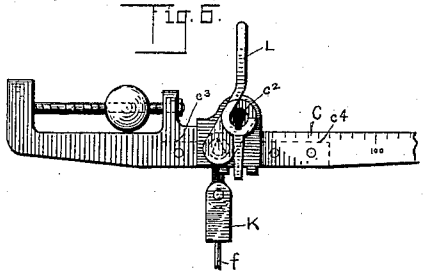


Fig. 7.

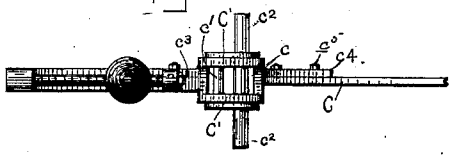


Fig. 9.

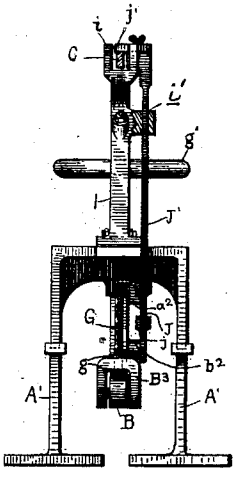


Fig. 8.

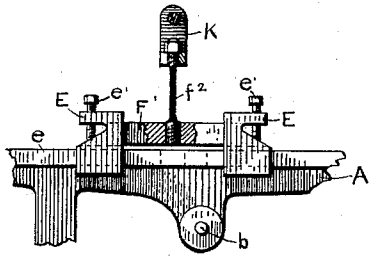
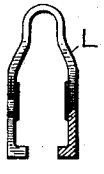


Fig. 10.



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UNITED STATES PATENT OFFICE.

THOMAS D. WEST, OF CLEVELAND, OHIO.

TESTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 340,842, dated April 27, 1886.

Application filed February 4, 1886. Serial No. 190,822. (No model.)

To all whom it may concern:

Be it known that I, THOMAS D. WEST, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Testing-Machines; and I 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 pertains to make and use the same.

My invention relates to improvements in testing-machines; and it consists in certain features of construction and in combination of parts hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation, partly in section, of my improved testing-machine. Fig. 2 is a transverse section on the line of *x x*, Fig. 1. Fig. 3 is a transverse section on the line of *y y*, Fig. 1. Fig. 4 is a plan view of the bed-plate. Fig. 5 is a plan view of the lever B. Fig. 6 is a side elevation of a portion of the scale-beam, showing the suspension-hook attached. Fig. 7 is a top plan of the same with the suspension-hook removed. Fig. 8 is a detail illustrating the manner of testing the tensional strength of a rod. Fig. 9 is a right-hand end elevation. Fig. 10 is a detail of the suspension-hook.

A represents the bed-plate, that is mounted on suitable legs, A′, and supports the entire machine. Underneath, and pivoted at *b* to a depending lug of the bed-plate, is the forked lever B, the prongs of the lever embracing the supporting-lug. In each prong of the lever B is set a friction-roller, *b′*, that engages, respectively, bars B′, that support the scale-beam C, the latter having laterally-projecting knife-edges c^2, that engage suitable notches in the upper ends of the bars B′. The standards D are secured to the shelves A^2 of the bed, and are notched to embrace the bars B′ and serve as guides for the latter. The bars B′ have toes B^2, that in the depressed position of the bars rest upon the bed A, and in making tests the distance that these toes move from the bed indicates the deflection or elongation of the tested material, and this distance may be subsequently ascertained, as these toes after the test will remain stationary until the apparatus is again adjusted.

Sliding stocks E are made to hook at *e* under the edges of the broad part of the table or bed, and set-screws *e′* not only serve to fasten the stocks in the desired position on the bed, but by means of the screws *e′* pressing on top of the bed the stocks are raised so as to take up the "lost motion" or "slack." The stocks are set a suitable distance apart to accommodate, for instance, the bar F, that is to be tested laterally, the ends of the bar F entering under the respective bridges of the stocks, and a rod, *f*, is attached to the center of the bar F, and is connected to the hook K of the scale-beam.

If the tensile strength is to be tested, for instance, of the rod f^2, (see Fig. 8,) the stocks are placed near together, and a rigid bar, F′, is secured in the stocks, to which rigid bar is secured one end of the rod f^2 to be tested, the upper end of the rod being secured, as aforesaid, to the hook K. The hook K has a slotted lower end for convenience in attaching, for instance, bolts *f′* and f^2, without the trouble of unscrewing the nuts. Notches *a* in the shelves A^2 of the bed-plate are for allowing the stocks to approach near to each other, and the openings *a′* are for the passage of the bars B′. To the long end of the lever B is pivoted the yoke B^3, in which yoke is journaled the lower end of the screw-rod G, suitable collars, *g*, rigidly attached to the rod above and below the yoke, preventing an end movement of the rod through the yoke. The rod G passes through a nut, G′, and has a hand-wheel, *g′*, on the upper end.

The nut G′ has laterally-projecting trunnions g^2, that are journaled in the housings H, the latter being secured to the bed-plate, and a suitable opening, *h*, through the bed between the housings, allows the passage of the rod G without contact with the bed. With this construction, by turning the hand-wheel *g′* in one direction or the other the lever B is elevated or depressed, which in turn elevates or depresses the scale-beam and brings a strain upon or relieves from strain the metal being tested, the amount of such strain of course being measured by the weight P and poise *p*.

In order to make accurate tests, it is necessary that the scale-beam be kept in approximately a horizontal position, the same as for weighing accurately, to accomplish which I

have the following: A standard, I, connected with the bed and provided, if necessary, with a brace, I′, is forked at the upper end, and the prongs thereof, *i*, embrace the scale-beam and serve as a lateral guide, and the bottom of the fork serves as a rest for the scale-beam, so that in the depressed position of the latter it is only slightly inclined.

J is a lever pivoted to the depending lug a^2 of the bed. The lever is connected by a link, *j*, and stud b^2 to the lever B. At the other end of the lever J is pivoted the rod J′, that at *j′* is made to hook over the scale-beam and limit the upward movement of the latter. The hook end *j′* is preferably in the form of a button, as shown in Fig. 9, so that the button can be turned back from over the scale-beam when it is desired to move the latter from the testing-machine.

The rod J′ may pass loosely through a notch, *i′*, in the standard I, (see Fig. 9,) or any suitable guiding device may be had for holding the rod in the desired upright position. The relative lengths of the arms of the levers B and J and the arrangement of parts are such that the bars B′ and the rod J′ are elevated or depressed equal distances, and the hook *j′* is therefore made to always limit the upward movement of the scale-beam to a horizontal position.

The scale-beam is made in three pieces, of which the right and left hand portions may be of ordinary construction. The central part is preferably of cast-steel and bifurcated, the cheeks C′ supporting lateral pins *c* and *c′*, the former having knife-edges c^2, that engage the bars B′, as aforesaid, and the latter having a knife-edge inside the cheeks that engages the hook K. The central section is provided at its front and rear ends with the flanges c^3 and c^4, to which the end sections of the beam are secured by bolts or screws c^5.

There are several advantages in making the scale-beam in three pieces, as described. The one portion, on which the scale is marked, is made preferably of plate-steel, while the other parts are of cast metal and of a form that would be difficult and expensive to forge. The left-hand part may be made of ordinary cast-iron, while the central part should be made of cast-steel. The holes for the pins *c* and *c′* are cored with undercut or dovetail edges, and when the pins are set in their proper relative positions to the scale-beam soft metal is run in around the pins to hold them firmly in the cheek-pieces, thus avoiding the boring of the cheek-pieces and costly fitting. The central part has lugs or flanges c^3 and c^4, for attaching the other parts by bolts or rivets.

With the construction shown the scale-beam, after turning the button *j′* to one side, may be lifted from the testing-machine.

A hook, L, preferably of cast-steel, is provided and secured to some beam or stationary support. This hook is forked at the lower end and adapted to engage the knife-edges c^2, by means of which the scale-beam is supported in condition for weighing.

It requires but a moment to remove the scale-beam from the testing-machine to the hook L, or vice versa. The owner of a testing-machine may therefore have, without extra expense, always at hand a convenient weighing apparatus.

What I claim is—

1. A scale-beam consisting of a middle section having an open center and forwardly and rearwardly projecting flanges, and the end sections secured to said flanges, the said head having internal and external knife-edge bearings, substantially as set forth.

2. The combination, with guides, vertically-movable supports passing through said guides, and a scale-beam resting between and on the upper ends of said supports, of mechanism engaging the lower ends of said supports for elevating them, substantially as set forth.

3. In a combined testing and weighing apparatus, the combination, with a scale-beam and vertically-moving supports for the beam, of a vertically-moving stop for the scale-beam, connecting mechanism for moving the said supports and stop in unison, substantially as described, whereby the scale-beam is kept approximately in a horizontal position.

4. In a testing and weighing apparatus, the combination, with a scale-beam and vertically-moving supports for the scale-beam, of stops to limit the depression of the said movable supports, said stops being integral or rigidly connected with the supports, substantially as described, whereby the distance of the stops from the table indicates the deflection or elongation of the metal tested.

In testimony whereof I sign this specification, in the presence of two witnesses, this 20th day of January, 1886.

THOMAS D. WEST.

Witnesses:
CHAS. H. DORER,
ALBERT E. LYNCH.