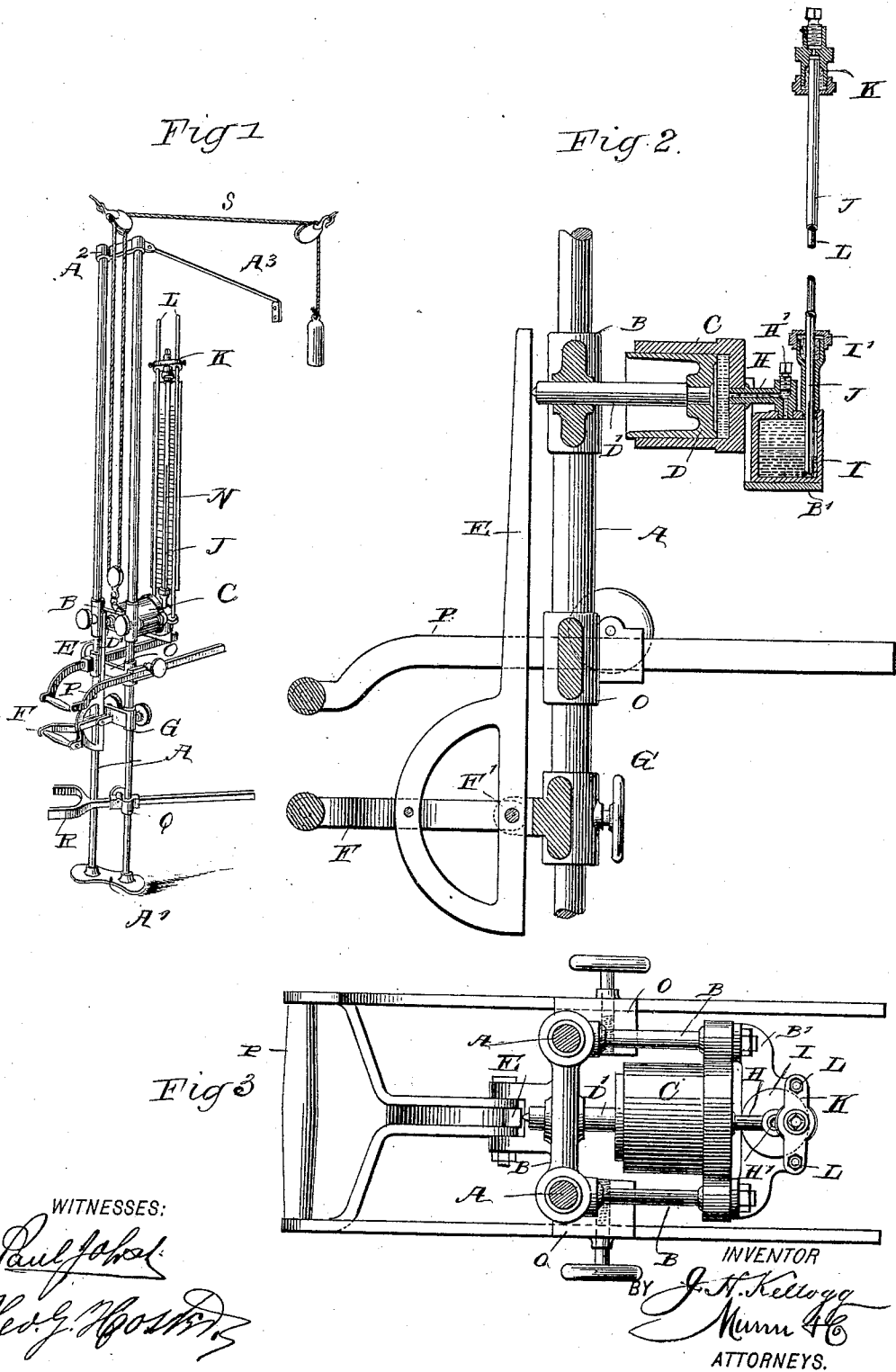


(No Model.)

J. H. KELLOGG.  
TESTING MACHINE.

No. 528,779.

Patented Nov. 6, 1894.



WITNESSES:  
*Paul J. ...*  
*Geo. J. ...*

INVENTOR  
BY *J. H. Kellogg*  
*Munn & Co*  
ATTORNEYS.

# UNITED STATES PATENT OFFICE.

JOHN H. KELLOGG, OF BATTLE CREEK, MICHIGAN.

## TESTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 528,779, dated November 6, 1894.

Application filed June 2, 1894. Serial No. 513,228. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN H. KELLOGG, of Battle Creek, in the county of Calhoun and State of Michigan, have invented a new and Improved Testing-Machine, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved testing machine or dynamometer, which is more especially designed for testing the strength of different groups of muscles in the human body.

The invention consists in certain parts and details, and combinations of the same, as will be hereinafter fully described and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the views.

Figure 1 is a perspective view of the improvement. Fig. 2 is an enlarged sectional side elevation of part of the improvement, and Fig. 3 is a plan view of the same.

The improved testing machine is provided with two standards or posts A, supported at their lower ends on a base A' adapted to be fastened to the floor, and likewise connected at their upper ends by a cross piece A<sup>2</sup>, attached by a brace A<sup>3</sup> to the wall or ceiling of the room in which the device is located. On the standards A is held vertically adjustable, a cross head B, supporting on its rear a cylinder C in which is fitted to slide a piston D having its piston rod D' extending into a bearing in the cross-head B, as plainly illustrated in Fig. 2. The outer free end of the piston rod D' is adapted to be engaged by the free end of an arm E extending from the hand lever F, fulcrumed at F', to a cross head G held vertically adjustable on the standards A. Now, it will be seen that when pressure is exerted in an upward direction on the lever F, then the arm E will press the piston rod D' rearward so as to force the piston D rearward in the cylinder C. The rear closed end of the cylinder C is connected by a pipe H with a vessel I, into which projects a tube J passing upwardly and through a suitable stuffing box I' held on the top of the vessel I. The upper end of this tube J, which is preferably made of glass, or other transparent material, is supported in a cross-head K, held adjustable on

vertical guide rods L, supported on the frame B', carrying the vessel I. See Fig. 3. A graduated scale N is held in the guide rods L, so that the liquid rising in the tube J, indicates on the degrees marked on the said scale.

In the lower part of the vessel I, is held a quantity of mercury adapted to rise in the tube J, so as to indicate in degrees the muscular power exerted, as hereinafter more fully described, and on top of the mercury in the vessel I is an amount of water, above which stands a certain quantity of oil also filling the tube H and the cylinder C. Now, when the piston D is pressed rearward, as previously described, then it exerts a pressure on the liquid in the cylinder and consequently on that in the vessel I, so that the mercury rises in the tube J to a point indicated on the scale N, corresponding to the muscular power exerted by the operator manipulating the lever F as previously described. The upper end of the tube J may be open or closed so as to permit either a free descent of the liquid in the tube J, or to assist its ascension in the tube by the air contained in the upper end thereof at a time when the said tube is closed.

Above the cross-head G is arranged a vertically adjustable cross head O, on which is fitted to slide transversely a rest P, adapted to be fastened in place by set screws or other suitable means. Below the cross-head G is held a slide Q on one of the standards A, and this slide is adapted to be fastened in place by a suitable set screw or other means, and on the slide is fitted transversely a rest R, formed at its front end with a fork to permit the operator to place a foot or leg or other part of his body in the fork, to offer the necessary resistance when manipulating the lever F.

It will be seen that in using this device, the operator can conveniently actuate the lever P by hand, or by means of straps attached to any desired part of the body, and rest some member of the body on either of the rests P or R, or both as the case may be. By this arrangement any desired group of muscles in the human body can be tested as to their strength, it being understood that the liquid rising in the tube J indicates the corresponding degree of power on the scale N.

The cross-head B and parts supported thereby are counterbalanced by a suitable device S, so as to permit the operator to conveniently shift the said cross head and the parts it supports, up or down on the standards according to the nature of the test desired to be made.

By using the three different liquids in the vessel as described the mercury does not come in contact with the cylinder to corrode or otherwise injure the cylinder piston, packing or tube H, and by the water intermediate the oil and mercury, the latter two cannot combine chemically, as is well known. The oil in the cylinder lubricates the reciprocating piston so that the machine operates easily.

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

1. A testing machine comprising a vertical standard, a cross head adjustable vertically on the standard, a horizontal cylinder mounted on the cross head and provided with a piston having a piston rod extending toward the standard, a fluid-containing chamber communicating with the cylinder and provided with a graduated indicator tube, and a vertically rocking lever pivotally connected with the standard and having one arm extending in operative relation to said piston rod, substantially as described.

2. A testing machine comprising a vertical frame or standard, a vertically adjustable counter-balanced cross-head on the standard, a cylinder carried thereby and provided with a piston having its rod extending through one end, a liquid containing chamber com-

municating with the cylinder and having an indicating tube, a second adjustable cross-head on the standard and a lever pivoted to the cross-head and extending at one end into operative relation with the piston rod, substantially as described.

3. A testing machine comprising a vertical standard provided with a series of vertically adjustable cross-heads a cylinder on the upper cross head provided with a piston having a piston rod through one end, and a liquid containing chamber communicating with said cylinder and provided with an indicator tube, a horizontal rest adjustable in the middle cross-head and a lever mounted on the lower cross head and extending at one end into operative relation with said piston, substantially as described.

4. A testing machine comprising a cylinder, a piston in the said cylinder and adapted to be pressed by the muscular power exerted by the operator, a vessel connected with the said cylinder and containing mercury, water and oil, of which the latter extends into the cylinder, and a tube extending into the said mercury to permit the latter to ascend in the tube, substantially as shown and described.

5. A testing machine comprising a vertical standard, a counter-balanced indicator mechanism vertically adjustable on the standard, a lever adjustable on the standard toward and from the said indicator mechanism and in operative relation thereto.

JOHN H. KELLOGG.

Witnesses:

THEO. G. HOSTER,  
C. SEDGWICK.