A. B. DAVIS.

Improvement in Apparatus for Testing the Tensile Strength of Metals.

No. 130,284. Patented Aug. 6, 1872.

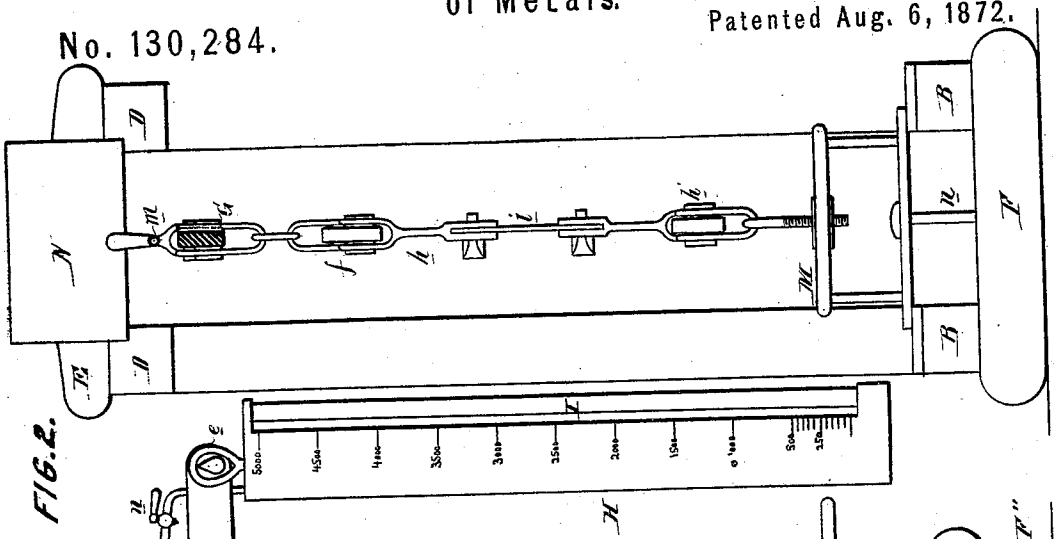


FIG. 2.

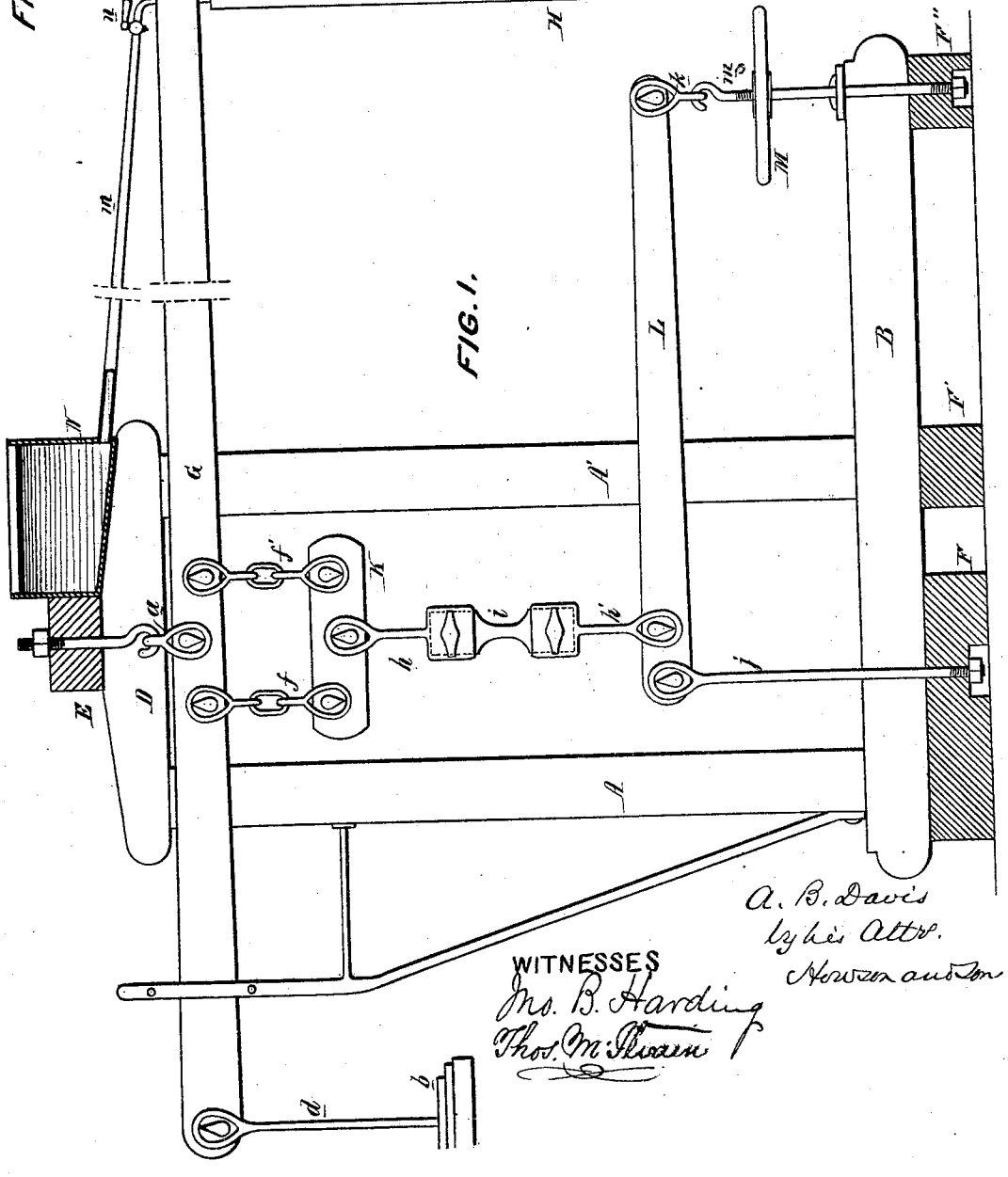


FIG. 1.

WITNESSES

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AM. PHOTO-LITHOGRAPHIC CO. N.Y. (OSBORNE'S PROCESS.)

UNITED STATES PATENT OFFICE.

AUGUSTUS BALL DAVIS, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO HIMSELF, W. C. EWING, G. C. EWING, JR., AND J. W. GRANT, OF SAME PLACE.

IMPROVEMENT IN APPARATUS FOR TESTING THE TENSILE STRENGTH OF METALS.

Specification forming part of Letters Patent No. **130,284**, dated August 6, 1872.

Specification describing an Improved Testing Apparatus, invented by AUGUSTUS B. DAVIS, of Philadelphia, Pennsylvania.

Improved Testing Apparatus.

My invention consists of apparatus, too fully described hereafter to need preliminary description, for determining the force required to tear apart a strip of metal or other materterial.

In the accompanying drawing, Figure 1 is a side view, and Fig. 2 an end view of my improved testing apparatus.

The permanent part of the apparatus consists of two side frames, each being composed of parts A and A′, secured at the top to the beam D, and at the bottom to the beam B, the two frames being connected together at the top by the transverse bar E, and at the bottom by the foundation beams F, F′, and F″. It should be understood, however, that the permanent frame-work of the apparatus may be constructed in different ways without departing from the main features of my invention. A lever, G, is hung, by a clevis, *a*, to the cross-bar E of the frame-work, and to the end of the long arm of this lever is suspended, by a clevis, *e*, a long vessel, H, for receiving water or other appropriate liquid, a glass tube, I, open at the top, being attached to this vessel, and communicating with the same near the bottom. To the short arm of the lever is suspended a counter-weight, sufficient to balance the long arm and its vessel H when the latter is empty. On the vessel are marked graduations, as shown in the drawing, these graduations being adjacent to the glass tube, so that they can be readily compared with the water-level in the same. A bar, K, is suspended, by clevises *f* and *f′*, to the lever G, one on each side of the fulcrum of the said lever, and this bar K is connected to a lever, L, by two clevises, *h* and *h′*, between which is the strip of metal, *i′*, to be tested. The lever L has its fulcrum at the end of a rod, *j*, secured to the foundation of the frame in any suitable manner, and at the outer end of the lever L is a clevis, *k*, connected to a rod, *m*, which is arranged to screw into the hub of a hand-wheel, M, the latter being connected to a rod, *n*, secured to the foundation of the frame-work, all as shown in Fig. 2. A reservoir, N, containing water or other suitable liquid, is situated at the top of the frame, or in any elevated position adjacent to the same, and a tube, *m*, extends from this reservoir to a point adjacent to the top of the vessel H, where it is turned down, so that the water from the reservoir can flow into the vessel through the tube, which is provided with a cock, *n*, or its equivalent. The sharp-edged projections on the bar K for the clevises *f*, *f′*, and *h* are relatively so situated that a very slight weight added to the long arm of the lever G will exert a greatly-increased force to tear apart the object *i′* to be tested, as will be readily understood by those familiar with the compound steelyard of weighing-scales; and the exact increase of force attained by the system of compound levers being determined, the vessel H may be so graduated that the amount of water it contains is made to indicate the exact force applied to tear apart the object *i′*.

As considerable more movement is required to test the object *i′* by separating the clevises *h* and *h′* than can be conveniently obtained by the compound levers, it becomes necessary to pull down the clevis *h′* while the apparatus is in action, and this may be accomplished in the present instance by turning the hand-wheel M, and thereby depressing the lever L. Although I prefer this depressing mechanism, as being convenient for the operator who desires to compare the water-level in the tube I with the graduations on the vessel H while he is manipulating the hand-wheel, other devices for depressing the object *i′* will readily suggest themselves.

It will be unnecessary to describe the operation of the apparatus further than by remarking that the level of the water in the glass tube I, when the object *i* is torn asunder by the weight of the water, will, by the aid of the graduations on the vessel, indicate the exact force exerted to accomplish the fracture.

I claim as my invention—

The combination, with the differential beam and griping-clevis *h*, of the adjustable lever L and griping-clevis *h′*, substantially as and for the purpose described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

AUG. BALL DAVIS.

Witnesses:
WM. A. STEEL,
HARRY SMITH.