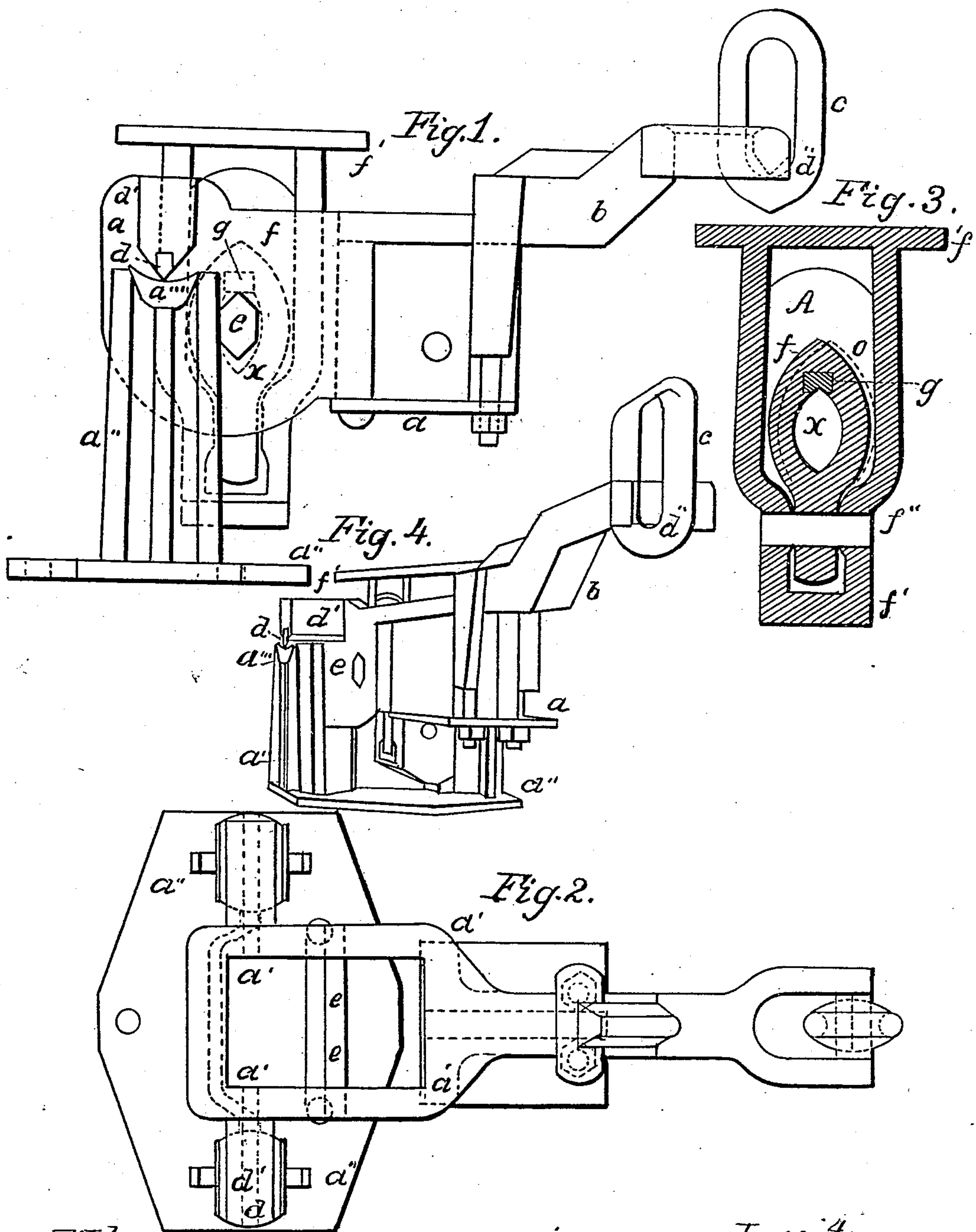


J. F. KEELER.

Scale Beam.

No. 78,748.

Patented June 9, 1868.



Witnesses,
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JOEL F. KEELER, OF PITTSBURG, PENNSYLVANIA.

Letters Patent No. 78,748, dated June 9, 1868.

IMPROVEMENT IN HOLLOW-HEADED SCALE-BEAMS.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, JOEL F. KEELER, of the city of Pittsburg, county of Allegheny, and State of Pennsylvania, have invented a new and improved Mode of Constructing Hollow-Headed Scale-Beams, and of adapting them to platform-scales; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

The nature of my invention consists in constructing hollow-headed scale-beams in such a manner that, while the weight and the fulcrum are brought near to each other, they are nevertheless kept on separate pivots, held firmly in their respective places, and in constructing platform-scales so as to rest the fulcrum of the main beams on fixed bearings, while, at the same time, suspending the weight on platform-bearings that oscillate, or *vice versa*.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

I make my beams and scales in any known form, and of any known material or combination thereof; but I usually prefer to make them partly of cast and partly of wrought iron, with cast-steel pivots and bearings. Thus, I make my beam, *a*, with a hollow head, so called because of the space, *a' a' a' a'*, in it, in which the link-bearer *f'* hangs. *b* is an adjustable piece, holding the minor pivot *d''* suspended in the link *c*. *e* is the pivot, on which the article to be weighed usually hangs by means of the platform female bearing or link *f* and the link-bearer *f'*. *d* is the steel pivot, usually forming the fulcrum of the lever. This steel pivot is supported, throughout its entire length, by a cast-iron projection, *d'*, which projection holds the steel pivot, after the pivot is filed, fitted, and hardened, firmly in its place. The link *f*, in the link-bearer *f'*, is usually made of cast iron, with a steel female bearing cast into it, though frequently of wrought iron and steel, and hardened, and hangs by the link-pin *f''*, which pin passes through the link-bearer *f'*, and through a hole in the link, so countersunk on each side as to permit it to oscillate freely on that pin in any direction. These oscillations are shown by the red lines *o o*, Figure III.

Hollow-headed scale-beams are usually made for weighing large weights, and the pivots or bearings are apt to work loose, if not bend or break, unless held by more than one end of the pivot. To obviate this difficulty, I made, in my patent of July 12, 1864, the respective pivots, for both the fulcrum and the weight, in one and the same piece of metal, the fulcrum-pivots on the outside of the head, and the weight-pivot on the inside; but this construction is not only difficult to make, and liable to inaccurate adjustment, by reason of the warping or springing of the metal in process of hardening, but also necessitates the weakening of the beam by making through the head so large a hole as is necessary for passing through it so large a piece of metal. Now, in order to obviate all these difficulties, I make each of the outside fulcrum-pivots of only a small-sized piece of steel, *d*, and support it, throughout its entire length, by a cast-iron projection, *d'*, from the outside of the beam-head. This mode of construction is the more necessary for hollow-headed beams, because the making of the two sides of the hollow head of sufficient thickness to hold in the pivots firmly would require such an amount of metal in the head as to unfit it for use, especially as a portable scale-beam.

By combining the fixed stud or bearing *a''* with the platform link-bearer *f'*, I am enabled to make a strong scale of a very shallow depth, to leave the platform suspended freely, but without so much motion as to require check-rods, and also to cover all the machinery from dust, water, &c., by the platform, items of great importance, especially in large out-of-door scales, exposed to snow and ice as well as dirt.

In using the hollow-headed scale-beam as a platform or primary beam or lever, in constructing platform-scales made with compound levers, I connect such hollow-head scale-beams with any known device which will permit of oscillation, either of the beam itself, or of the weight placed on it, or both. Thus, if it is designed that the weight and the platform on which the weight rests shall oscillate, then that weight is placed on some device operating like the link-bearers *f'*, whether that link-bearer and link *f* are connected with the inside pivot *e*, and the beam rests on the stud *a''*, by means of the outside pivots, *d d'*, or whether the arrangement is reversed, and the beam rests on a stud, by means of an inside pivot, while the link-bearer and links are attached to the

outside pivots, in which latter case the relative positions of such inside and outside pivots would usually be exchanged. If it is intended that the beam (when used as a platform-lever in a compound-platform scale) alone shall oscillate, then the fulcrum or pivots $d d$ will usually be suspended in links or other vibrating-devices, and the weight or platform will rest on the inside pivot without the intervention of the link f or other vibrating-device; but, if it is desirable to have both the lever and the weight to oscillate, then both the inside and the outside pivots will have vibrating-devices.

When desirable to have the levers oscillate, as in case when the studs happen to stand on a yielding foundation, or on one not entirely firm, then, in order to obviate any danger of the stud yielding, and thereby causing a pinching or cramping of the pivots in the beam, I invert the combined link-bearer and link, and use two sets of them in such inverted position, instead of the fixed stud a , for the outside pivots $d d'$ to hang in. I then use either a link-bearer and link in an upright position on the inner pivot, e , or I use an inverted fixed stud of any known form, at will.

I notice these features thus definitely, because either the platform or the levers, or both, in a platform-scale, must be susceptible of oscillation, or the scale will not act, and because the methods of securing such oscillation are too numerous to be shown.

I do not claim the invention of the hollow-head scale-beam, nor its use as a graduated vibrating-beam, but not limiting myself to any particular mode of construction of hollow-headed scale-beams themselves, or of their attachments, (fitting them for use as primary levers in constructing compound-platform scales,) nor to any mode of combining them, as primary beams, with other beams, of similar or dissimilar construction, for producing such scales—

What I claim is—

1. Adapting hollow-headed scale-beams, of any known construction, to use as primary levers in the construction of compound-lever platform-scales, substantially as herein described.
2. I claim the use of the combined link-bearer f' and link f , in the construction and operation of platform-scales, substantially as described.

JOEL F. KEELER.

Witnesses:

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W. N. PAXTON.