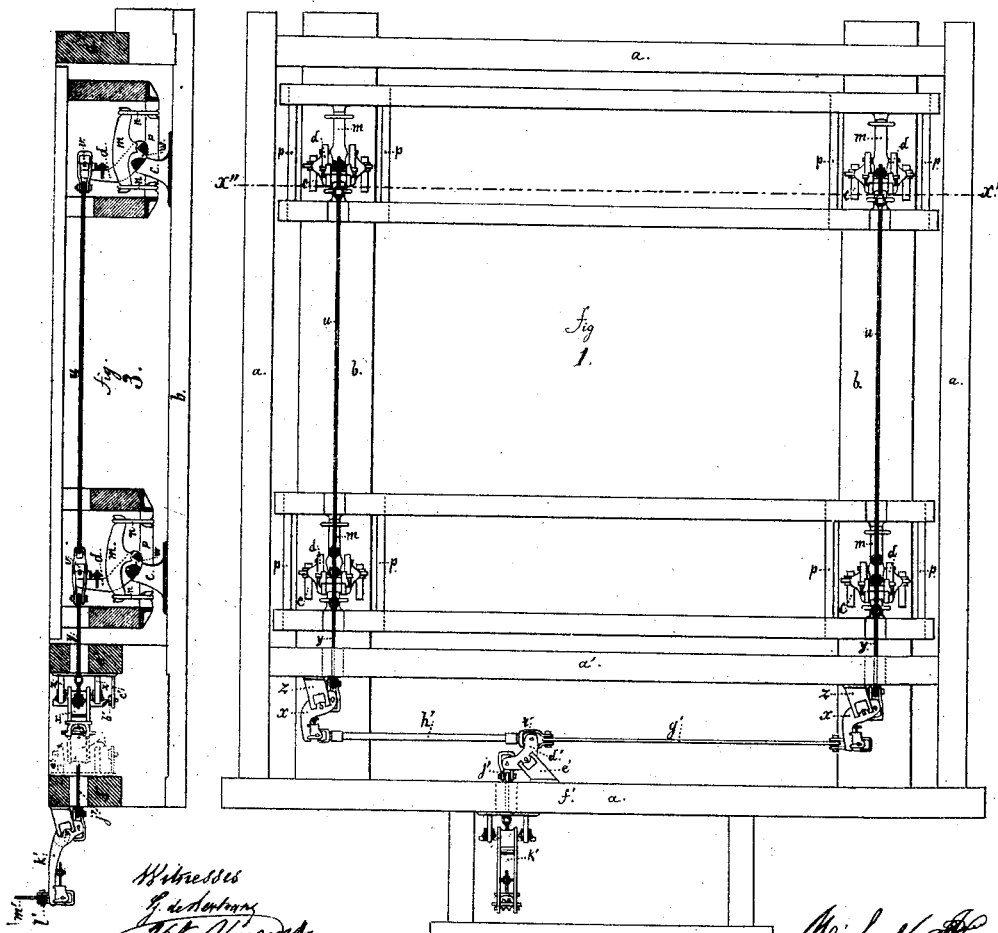
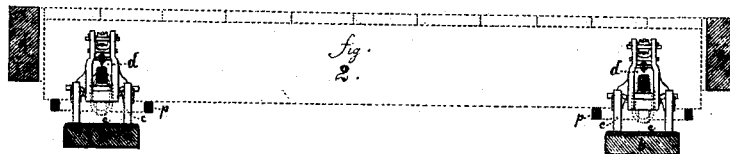
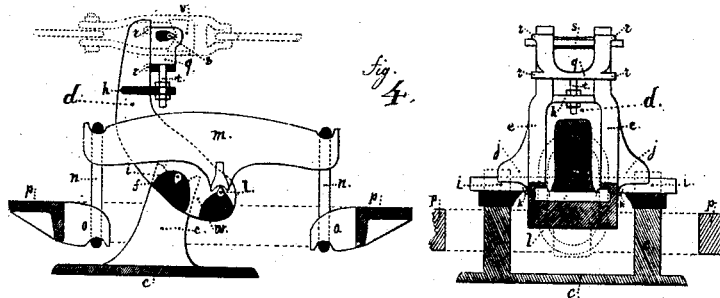


M. Kennedy,

Balance.

No. 113529.

Patented Apr. 11, 1891.



*Witnesses
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MICHAEL KENNEDY, OF NEW YORK, N. Y.

Letters Patent No. 113,529, dated April 11, 1871.

IMPROVEMENT IN PLATFORM-SCALES.

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, MICHAEL KENNEDY, of the city, county, and State of New York, have invented certain new and useful Improvements in Platform-Scales; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings making part of this specification, in which—

Figure 1 is a top view with the platform removed;

Figure 2, a vertical section taken in the plane of the line *x" x'* of fig. 1;

Figure 3, a section taken in a vertical plane passing through the middle of one pair of primary levers; and

Figure 4, a front elevation and a section of one of the primary levers, bearings, and connections on an enlarged scale.

The same letters indicate like parts in all the figures.

My said invention relates to improvements in what are known as the Sampson scales.

The first of my said improvements relates to means for reducing the friction of the levers that vibrate in horizontal or inclined planes, which improvement consists in forming a pivot in line with the knife-edge fulcrum of such levers to rest on a steel bearing below, so that the friction due to the weight of such levers when vibrating shall not materially impede the working. The bell-crank levers of such scales are usually made of cast-iron, and the knife-edges of steel set into the cast-iron, and, as heretofore made, the slightest lateral play causes the bearing-blocks to make friction against the sides of the levers. With a view to reduce such friction—

The second part of my said invention consists in having the steel knife-edges formed with end-shoulders projecting from the surface of the cast metal, and the bearing-blocks with lateral steel points in line, as near as may be, with the knife-edge, so that, in case of any lateral movement, the said steel points shall come into contact with the shoulders of the knife-edges and thus avoid the greater part of the friction which otherwise would impede the free working of the said levers; and

The third part of my said invention relates to the adjustability of the knife-edge in one arm of the bell-crank levers.

I am aware that such knife-edge has heretofore been made adjustable toward and from the fulcrum of the lever; but my said improvement consists in combining with the slide to which the knife-edge is secured, and the adjusting-screw by which the slide is moved, cheeks, which embrace the sides of the arm of the lever, or as the equivalent thereof, which are embraced by the sides of the arm of the lever, so that

the parallelism of the knife-edge and the fulcrum of the lever shall be maintained.

When the lever which serves to transmit the action of the platform directly or indirectly to the beam is placed between the secondary levers, one of them must transmit such action by thrust; and if the connection be formed by a solid rod it is liable to yield by flexure, unless it be made so thick as to be an objectionable weight.

The fourth part of my said invention consists in combining with the secondary levers and the transmitting-levers, placed between them, the connection of the lever so interposed with that one of the secondary levers which imparts the action by thrust, a tubular connecting-rod, or the equivalent thereof, whereby the flexure is avoided without too much weight.

In platform-scales the short arms of the primary levers, on which the platform rests, are unavoidably in a horizontal, or nearly horizontal, position; and the practice has been to make such arms solid, so that water, dust, and other impurities accumulate on the upper surface and cannot escape, and, in consequence, the knife-edges soon become rusty and impede the free action of the scale. With a view to remedy this defect—

The last part of my said invention consists in constructing the lower arms of the said primary levers with an open space between the knife-edges on which the platform rests and the fulcrum, for the free escape of water and dirt.

In the accompanying drawings—

a represents the usual frame-work of a platform-scale, such as used for railroads, and

b b the lower timbers, on which are secured the bearings *c c c c* for the primary levers *d d d d*, two on each side.

The said bearings *c c c c* are formed each of a base-plate and two standards, preferably made of cast-iron, to the upper end of which standards are fitted steel bearings, on which the knife-edge fulcrums of the levers rest and vibrate.

The inner faces of these steel bearings are beveled to a point, so that the most projecting part shall, as near as possible, be in line with the knife-edge of the fulcrum of the primary levers when in place, the object of this construction having been stated in declaring the nature of my invention.

The primary levers *d* are all alike, and preferably cast in one piece. The description of one will do for all.

It consists of two side pieces, *e e*, connected by three cross-pieces, *f g h*.

The fulcrum *i* is made of steel and embedded in the cross-piece *f*, and projects on each side of the side

pieces to a sufficient distance to rest on the bearings *c c*, the under surface of the projecting parts being brought to a knife-edge.

The side pieces *e e* are formed with projecting shoulders, *j j*, extending out as far as the fulcrum, to give ample support.

On each side of the lever the steel fulcrum is formed with a shoulder, *k*, slightly projecting from the outer faces of the lever and next to the inner ends of the knife-edges, so that, in case of any lateral play of the levers when in action, the said steel shoulders shall come in contact with the projection on the outer faces of the steel bearings, and thus reduce to the minimum the friction due to any contact which may take place when the levers are in action.

The lower and short arm of the primary levers is provided with a steel knife-edge, *l*, embedded in the cross-piece *g*, and this is formed with end shoulders projecting from the inner faces of the side pieces of the lever; and the middle of the balance-bar *m*, which rests on this knife-edge, is made of steel, with the ends beveled to points, in like manner and for the same purpose as the steel bearings for the fulcrum before described.

There is one such balance-bar *m* for each of the primary levers, the ends of each balance-bar being connected by suspension-links *n n*, with hangers *o o* of the platform *p*, as in scales heretofore used.

The upper and long arm of the primary levers is formed with the two sides beyond the third cross-piece *h* parallel, to form ways, to which is fitted a slide, *q*, with side cheeks *r r* embracing, so that the said slide shall not have lateral play.

The steel knife-edge *s* for this arm of the lever is embedded in a cross-piece of the slide *q*, and formed with end shoulders, in like manner and for the same purpose as the knife-edges before described.

The slide *q* is provided with an adjusting-screw, *t*, which extends through a hole in the before-named third cross-piece *h* of the lever, so that, by means of nuts on each side of the cross-piece, the distance of the knife-edge *s* can be adjusted relatively to the fulcrum with the greatest nicety and there secured. The cheeks *r r* that embrace the ways effectually maintain the parallelism of the knife-edges.

The primary levers are connected in pairs by two rods, *u u*, one on each side, the ends of the said connecting-rods being provided with steel bearing-blocks *v v*, the sides of which are beveled to points to reduce friction, in connection with the shoulders at the ends of the knife-edges.

The lower arm of the primary levers is formed with an open space, *w*, between the fulcrum and knife-edge *l*, for the free passage of water and dirt, which otherwise would accumulate on that part of the lever and soon impede the free action of the parts, as in scales heretofore made.

The two pairs of primary levers are connected with the secondary levers *x x*, one on each side, by means of two auxiliary rods, *y y*, connected with the rods *u u*, before described.

These secondary levers are constructed in manner similar to the primary levers, and the auxiliary connecting-rods *y y* are connected with their short arms, the knife-edges being formed with end shoulders, and the steel bearing-blocks in the rods with the sides beveled to points, as before described, in connection with the primary levers.

These said secondary levers vibrate in horizontal planes, and the bearings *z z* for their fulcrums are secured to and project from a beam, *a'*, of the frame; and to reduce the friction which would be induced by their entire weight when in action, the lower end of the fulcrum of each lever is brought to a point in line

with the knife-edge, and this point rests on a hardened steel plate, *b'*, secured to a stud, *c'*.

The knife-edges of the longer arms of these levers are mounted in adjustable slides, similar to those on the upper arms of the primary levers.

The two secondary levers are connected with one intermediate lever, *d'*, which also vibrates in a horizontal plane, the knife-edges of its fulcrum working against bearings *e'*, secured to and projecting from a beam, *f'*, of the frame, the friction due to the weight of this lever being reduced in the same manner as described in reference to the secondary levers. The knife-edge on one of the arms of this lever is also adjustable in manner similar to the levers before described.

As this lever is placed between, and receives motion simultaneously from, the two secondary levers, one must push and the other pull; and if both were connected by rods, one of them, unless made of too great a weight, would yield by flexure.

To prevent this the connection on one side is formed by a rod, *g'*, and on the other by a tube, *h'*.

The tube *h'* is provided with bearing-blocks at each end, and one end of the tube is connected by an open link, *i'*, with the rod *g'*.

The bearing-block at that end of the tube next to the secondary lever is mounted in a piece separate from, but fitted to, the end of the tube by a threaded socket, to admit of adjusting the length.

The intermediate lever last described is in turn connected by a rod or link, *j'*, with the short arm of a transmitting-lever, *k'*, the long arm of which is in turn connected by a link, *l'*, with the steelyard *m'*, the knife-edge in the long arm of the said transmitting-lever being mounted in an adjusting-slide, and the fulcrum and knife-edges and bearing-blocks being formed and connected in like manner as the primary and secondary levers, before described.

And although I prefer a tube for forming the connection between the intermediate lever and that one of the secondary levers which acts by thrust, as best suited to prevent flexure, I do not wish to be understood as limiting my claim of invention to that form, as a thin rod with three or more projecting flanges, or three or more thin rods connected by end plates, will answer the same purpose.

All the fulcrums and knife-edges, with their end shoulders, and the bearings with beveled or pointed faces, are to be made of steel, properly hardened, or of equivalent hard substance.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In combination with a lever which vibrates in a horizontal or inclined plane, and whose axis of vibration is a knife-edge, substantially as described, a point or pivot at the lower end of its fulcrum and in line with the knife-edge, and a bearing for the said point or pivot, substantially as and for the purpose described.
2. The knife-edges formed with end shoulders, in combination with the sides or ends of the bearing-blocks beveled to a point, or nearly as may be in line with the knife, substantially as and for the purpose described.
3. In combination with the secondary levers and a transmitting-lever interposed between and receiving action from both simultaneously, a connecting-tube, or the equivalent thereof, for transmitting the action by thrust, substantially as and for the purpose described.

MICHAEL KENNEDY.

Witnesses:

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