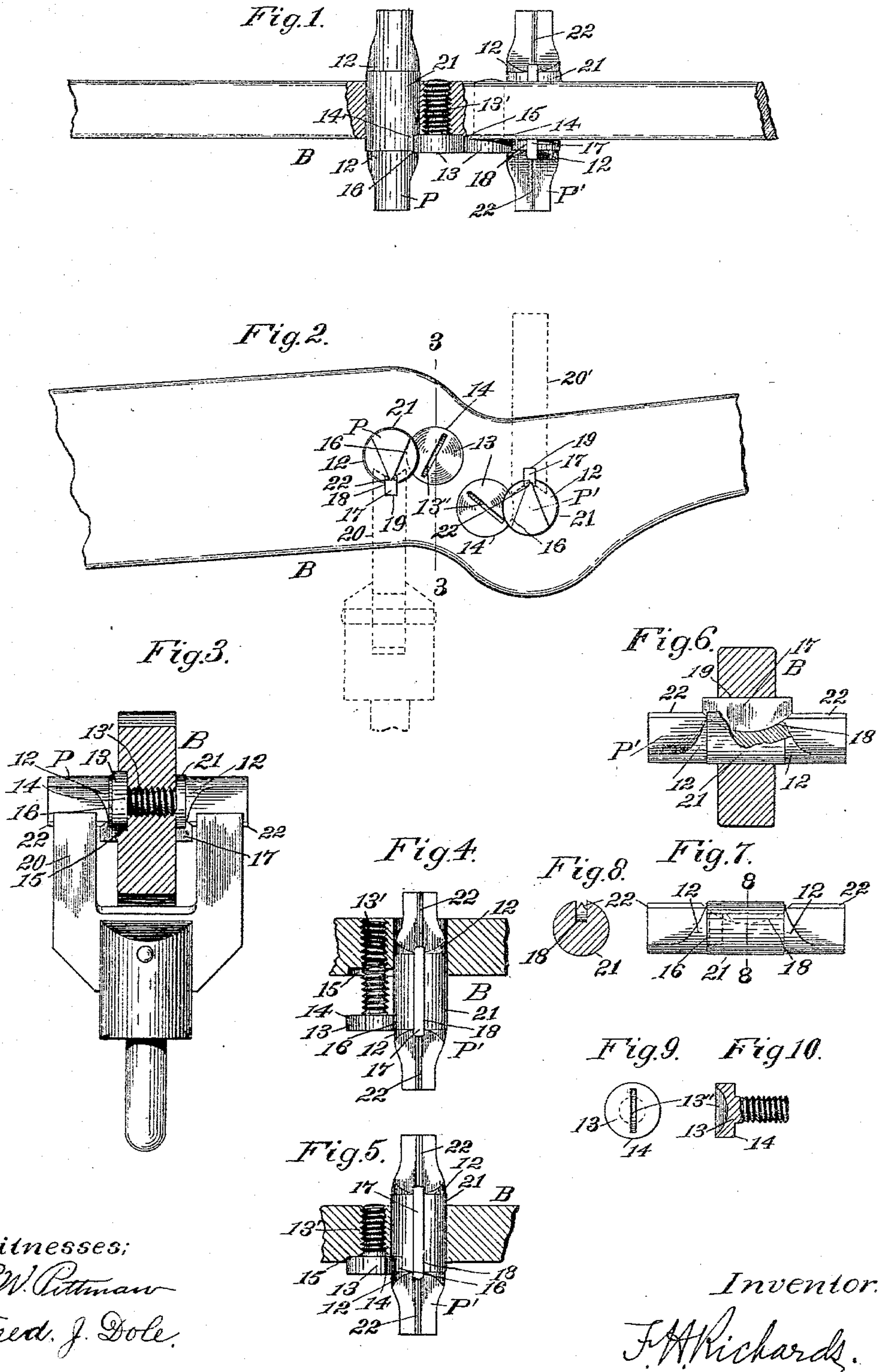


(No Model.)

F. H. RICHARDS.
KNIFE EDGE PIVOT FOR SCALE BEAMS.

No. 559,750.

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UNITED STATES PATENT OFFICE.

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KNIFE-EDGE PIVOT FOR SCALE-BEAMS.

SPECIFICATION forming part of Letters Patent No. 559,750, dated May 5, 1896.

Application filed January 31, 1896. Serial No. 577,553. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS H. RICHARDS, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Knife-Edge Pivots for Scale-Beams, of which the following is a specification.

This invention relates to knife-edge pivots adapted for use in connection with scale-beams and the like, the object being to provide a strong and serviceable device of this character and to provide simple and efficient means for applying to and holding said knife-edge pivot in place and against movement in all directions when in operative position relative to the scale-beam or other like device.

In the drawings accompanying and forming part of this specification, Figure 1 is a plan view with a part of the scale-beam broken away to better illustrate the improved means for holding a knife-edge pivot in operative position thereon. Fig. 2 is an end elevation of the same. Fig. 3 is a transverse section on the line 3 3, Fig. 2. Fig. 4 is a sectional plan view of a part of the scale-beam, a knife-edge pivot, and a locker therefor, the knife-edge pivot having been placed in the receiving-bore therefor formed in the scale-beam and ready to be forced to the operative position. Fig. 5 is a similar view, the knife-edge pivot being illustrated in the operative position thereof on the scale-beam and held in such position by a locker or locking device. Fig. 6 is a transverse section of the scale-beam, a knife-edge-pivot means for holding the latter against rotative and endwise movement being also illustrated, a part of the pivot being broken away to better show said holding means. Fig. 7 is a detail view of the knife-edge pivot, and Fig. 8 is a transverse section on the line 8 8 thereof. Figs. 9 and 10 are detail views, in end elevation and in central longitudinal section, respectively, of the locker or locking device.

Similar characters of reference designate like parts in all the figures of the drawings.

The knife-edge pivot consists of a body portion and a knife-edge portion or knife-edge proper, and by the term "body portion" of the knife-edge pivot is meant that part thereof which is located in a bearing or otherwise

suitably carried by a scale-beam or other member, and by the term "knife-edge portion" or "knife-edge proper" is meant that part of the knife-edge pivot on which is located a V or other bearing—for example, in the manner disclosed in Letters Patent No. 548,840, granted to me October 29, 1895.

A portion of a scale-beam is illustrated at B transversely bored, the bores thereof constituting bearings for receiving the knife-edge pivots, which are designated, respectively, by P and P', the cylindrical body portions 21 of the latter being journaled or located in said bearings. The cylindrical body portions 21 of the knife-edge pivots are so fitted in the bearings thereof that said knife-edge pivots may be freely removed therefrom by the application of ordinary hand-pressure, but are not so loosely held as to induce wobbling.

The knife-edge pivot P is illustrated supported by a suitable support or bearing, (see Fig. 3,) illustrated as a double-V bearing and located on the knife-edge portion 22 thereof, said V-bearing 20 being carried by the base of the weighing-machine, and the knife-edge pivot P' constituting a bucket-support for supporting a similar double-V bearing 20', carried by the bucket or by a hanger thereon.

The knife-edge pivots P and P', it will be understood, are removably secured by the scale-beam, and hence are made interchangeable, so that they may be easily and quickly removed for sharpening or grinding the knife-edges 22 thereof when dulled and as quickly and easily applied in place, improved means, to be hereinafter described, being employed for setting said knife-edge pivots in absolutely true and accurate positions, these results being attainable by ordinary unskilled labor.

As the two knife-edge pivots P and P' are the same in all material respects, I deem it necessary to describe in detail but one of said devices—for example, the knife-edge pivot P, the same characters of reference being used to designate corresponding parts on the knife-edge pivot P'.

With the ordinary type of knife-edge pivot it often happens that these break or snap off at that part thereof which is subjected to the greatest stress, and to guard against and prevent such accidents a reinforced portion ex-

tending obliquely away from the knife-edge 22 at the end of the body portion 21 and outwardly from said body portion is provided, such reinforced portion being illustrated at 5 12. By reason of such reinforcement of the knife-edge pivot the latter will be of greatest cross-sectional area adjacent to the body portion, this gradually decreasing outwardly therefrom and will effectually resist all stress 10 applied thereto.

The knife-edge pivot P is illustrated consisting of two oppositely-disposed knife-edge portions 22, which, when said knife-edge pivot P is in its operative or working position 15 relatively to the scale-beam B, should equidistantly project from the opposite faces thereof, and great care should be exercised in placing or setting these pivots or knife-edges in position.

20 It will be evident that, and for the purpose, hereinbefore mentioned, these knife-edge pivots must be occasionally removed, and it will be apparent that with the ordinary types of knife-edge pivots the employment of skilled 25 labor is necessary to properly reset the same.

My invention contemplates the provision of means for setting and resetting these knife-edge pivots in true and accurate positions without the intervention of skilled labor, and 30 when in such positions positively holding the same against lateral and endwise movements, said pivots being, as heretofore stated, interchangeable.

An actuating-locker or locking device is 35 illustrated at 13 carried by the scale-beam, and when in its normal position is seated in an opening 13', formed therein, this device serving a dual function—that of a lock and of an actuator. This actuating-locker or 40 locking device 13 is operable for engaging the knife-edge pivot P, and when the former is driven or forced into its opening in the scale-beam or from its normal position therein the pivot P will be carried therewith. In 45 the embodiment illustrated this actuating-locker 13 is in the form of a headed screw, the opening in the scale-beam therefor having an internal thread for receiving said screw, the head or stop 14 of said actuating- 50 locker 13, when said screw is in its normal position, lying in a seat or counterbored opening 15, formed in the face of the scale-beam, against the inner wall of which opening the stop 14 abuts when the screw has reached 55 the limit of its inward movement, thereby indicating that the knife-edge pivot P has been properly set.

The body portion 21 of the knife-edge pivot is illustrated provided with a notch 16, trans- 60 versely formed therein, into which the head or stop 14 of the screw 13 enters, so that when the latter is forced into or out of its opening or seat in the scale-beam B the knife-edge pivot P will be carried therewith. The slot 65 13" of the head 14 of the screw 13 does not extend entirely across said head, so that as said screw is screwed into or out of its open-

ing no rough or uneven surfaces are presented by said head 14 to the walls of the notch 16 for abrading the same. 70

Means are provided also for limiting the rotative or lateral movement of the knife-edge pivot P in its bearing in the scale-beam B, and such means are shown consisting of a gage-key separable therefrom, and which is 75 adapted to be seated in a keyway or notch formed in the pivot. Such a key is illustrated at 17 and in practice will be formed of highly-tempered steel, it being subjected to considerable lateral and longitudinal pres- 80 sures during the operation of the weighing-machine. The keyway in the knife-edge pivot for receiving said gage-key 17 is illustrated at 18 and is illustrated longitudinally 85 disposed, being formed in the cylindrical body portion 21 thereof, and as also extending a short distance beyond said body portion to better adapt the knife-edge portion 22 to be ground throughout its entire surface.

The keyway 18 is complementary to a key- 90 way formed in the scale-beam and extending into the knife-edge-pivot bearing, said last-mentioned keyway being illustrated at 19 extending transversely of the scale-beam. The gage-key 17 is adapted to be seated in 95 these keyways formed, respectively, in the scale-beam B and the body portion of the knife-edge pivot P, and said keyways will be in alinement when the knife-edge pivot P is in its operative or working position. The in- 100 ner wall of the keyway or notch 18, formed in the body portion of the knife-edge, will preferably be curved, and the key 17, which is seated in said keyway, is illustrated as also curved, the curvature thereof being concen- 105 tric with that of the inner wall of said keyway, so that when said members are in operative positions thereof, as indicated in Figs. 1, 2, and 6, the engagement of these members limits also the longitudinal movement of the 110 knife-edge pivot P in its bearing, the locker 13 in turn holding said knife-edge pivot firmly in place against longitudinal movement.

On reference to Figs. 3 and 2 (see dotted lines, Fig. 2) the V-bearings there illustrated 115 as located on the knife-edge pivots P and P' are double or bifurcated. It will also be observed on reference to Figs. 1 and 3 that the key 17 for the knife-edge pivot P is illustrated projecting beyond the opposite faces of the 120 scale-beam B to thereby constitute end stops, whereby lateral movement of the scale-beam will be limited during the operation of the weighing-machine by the abutment of said V-bearing against the projecting key. This 125 operation also tends to firmly maintain the key 17 in its seat in the keyways formed, respectively, in the knife-edge pivots P and P' and the scale-beam B, the latter keyways ex- 130 tending, as hereinbefore pointed out, into the bearings of said pivots.

Having thus described my invention, what I claim is—

1. The combination with a scale-beam hav-

ing a bearing and an opening, of a knife-edge pivot located in said bearing; and a locking-actuator for engaging said pivot, and having a movement into and out of said opening, whereby when said locking-actuator is forced into or out of place, the knife-edge pivot will be carried therewith.

2. The combination with a scale-beam having a bearing and an opening, of a knife-edge pivot located in said bearing, said pivot having a notch; and a headed locking-actuator, the head of which is adapted to enter the notch in said knife-edge pivot, said locking-actuator having also a movement into and out of said opening, whereby when said locking-actuator is forced into or out of place, the knife-edge pivot will be carried therewith.

3. The combination with a scale-beam having a bearing, of a longitudinally-notched knife-edge pivot journaled in said bearing, and having the inner wall of the notch thereof curved; and a key seated in said notch, and having a part thereof curved concentric with the curvature of the inner wall of said notch and in engagement therewith.

4. The combination with a scale-beam having a bearing, and a keyway extending into said bearing, of a knife-edge pivot located in

said bearing and having a longitudinally-disposed keyway therein; a key seated in said keyways and projecting beyond the opposite faces of the scale-beam to thereby constitute end stops; and a double-V bearing located on the knife edges of said pivot.

5. The combination with a scale-beam having a bearing, and having a keyway extending into said bearing, and having also an opening; of a knife-edge pivot located in said bearing, and having a complementary keyway therein; a key seated in said keyways to thereby limit the lateral movement of said knife-edge pivot in its bearing; and a locking-actuator for engaging said pivot, and having a movement into and out of said opening in the scale-beam, whereby when said actuator is forced into or out of place, the knife-edge pivot and the key therefor will be carried therewith.

6. The combination with a scale-beam having a bearing, of a knife-edge pivot located in said bearing; and a locking-actuator for said knife-edge pivot.

FRANCIS H. RICHARDS.

Witnesses:

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HENRY BISSELL.