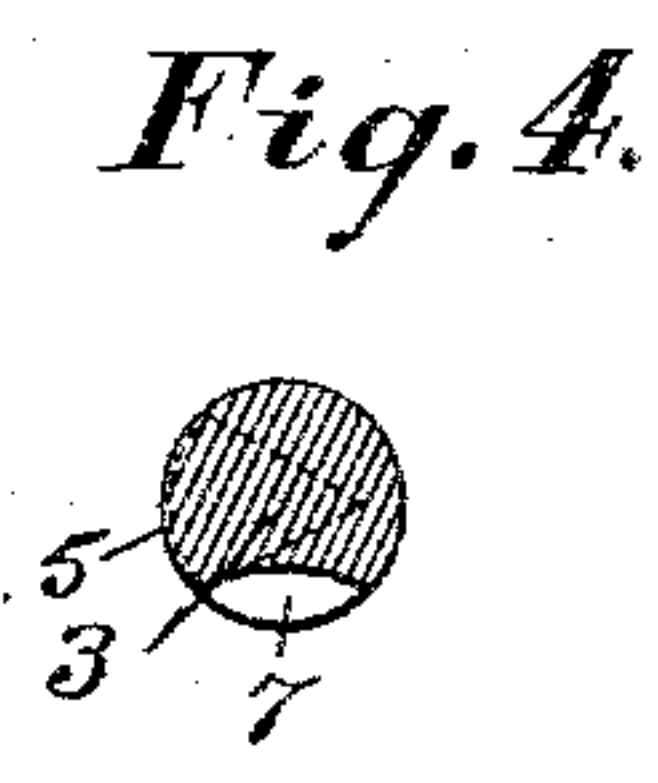
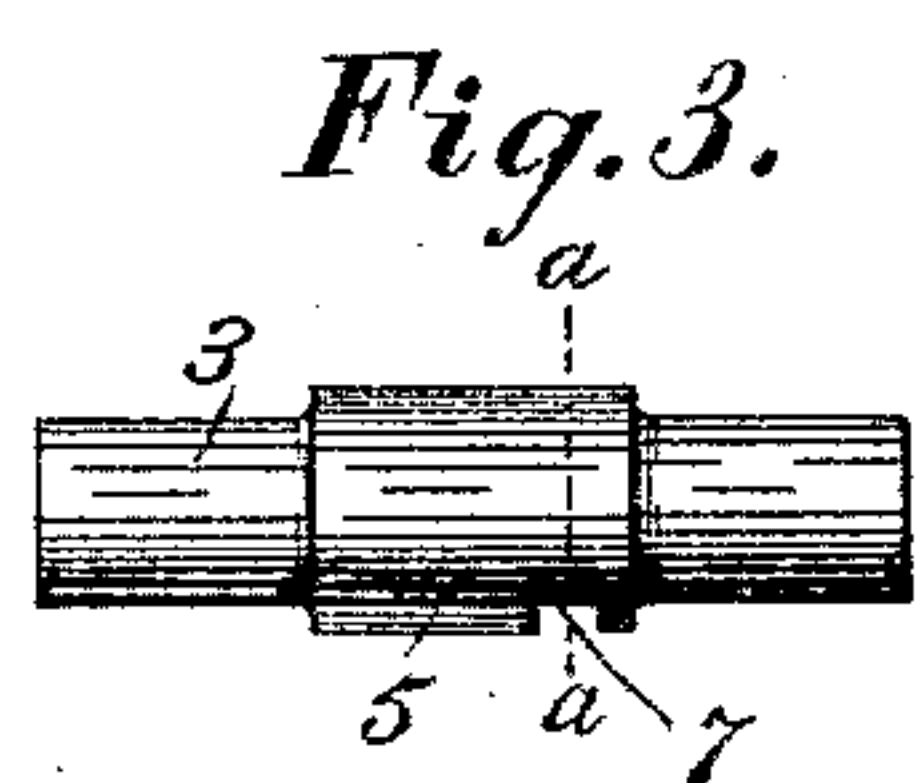
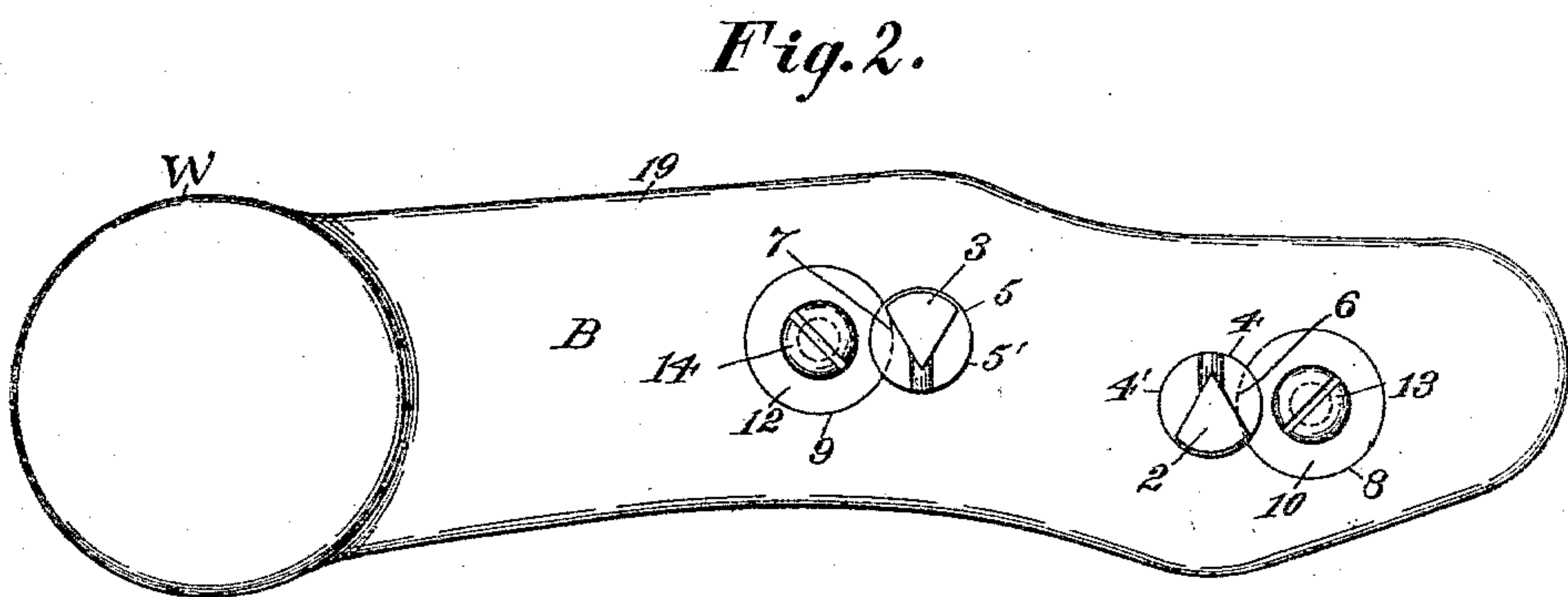
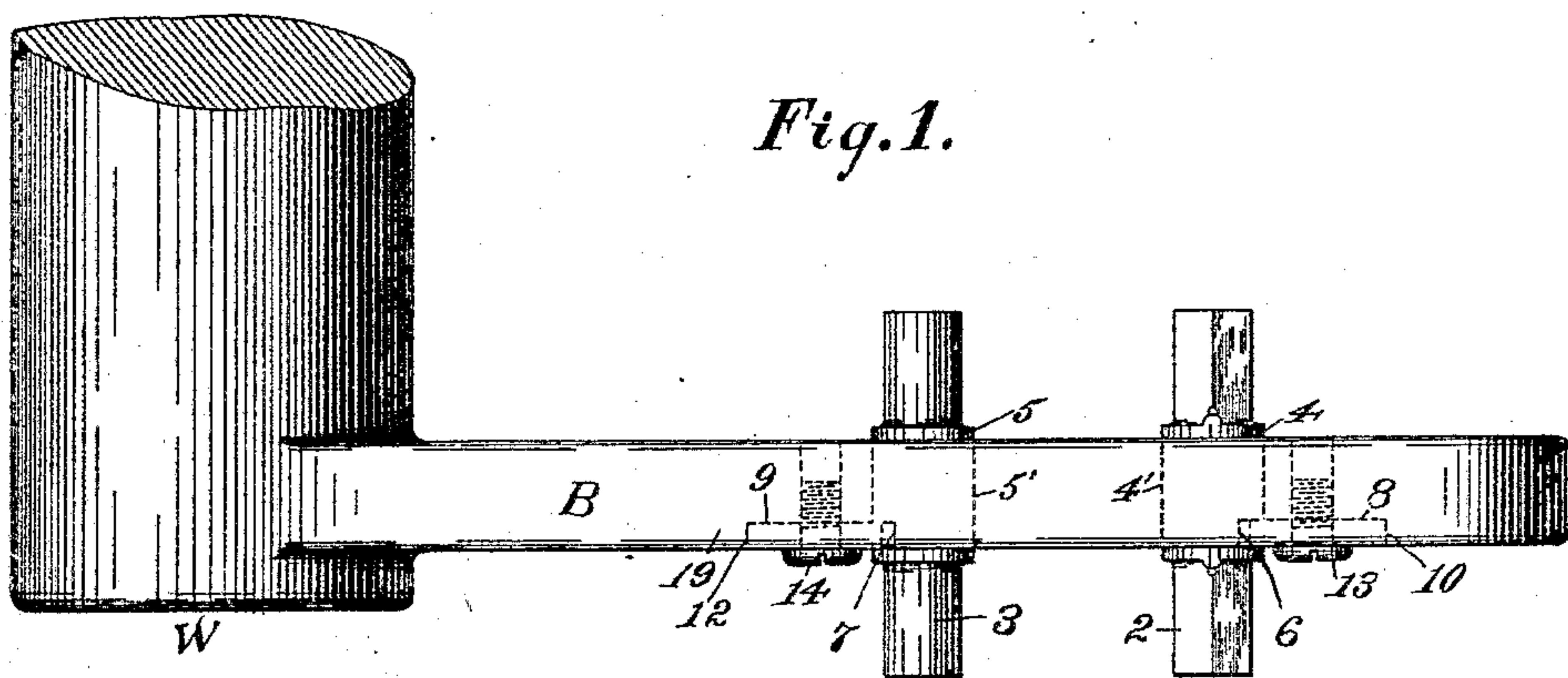


(No Model.)

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

No. 559,748.

Patented May 5, 1896.



Witnesses:

Chas. W. King.
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UNITED STATES PATENT OFFICE.

FRANCIS H. RICHARDS, OF HARTFORD, CONNECTICUT.

KNIFE-EDGE PIVOT FOR SCALE-BEAMS.

SPECIFICATION forming part of Letters Patent No. 559,748, dated May 5, 1896.

Application filed December 14, 1895. Serial No. 572,184. (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 weighing-machines, the object being to provide an improved scale-beam therefor embodying a removably-supported pivot or knife-edge and a locking device operable for maintaining said pivot or knife-edge against longitudinal and rotative movements when the latter is in its operative position.

In the drawings accompanying and forming part of this specification, Figure 1 is a plan view of one of the beam-arms of a scale-beam provided with my improvements and a part of the counterweight thereof. Fig. 2 is an end elevation of the same. Fig. 3 is a detail view in plan of one of the pivots or knife-edges. Fig. 4 is a transverse section on the line *a a*, Fig. 3.

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

The general construction of the scale-beam shown in the accompanying drawings, and which is designated in a general way by B, is substantially similar to one of the oppositely-disposed scale-beams shown and described in Letters Patent No. 548,839, granted to me October 29, 1895, to which reference may be had. Each of said scale-beams comprises a pair of beam-arms joined by a combined connecting-shaft and counterpoise, (one of these arms being shown at 19 and the counterpoise thereof being shown at W.)

The scale-beam carries a removable pivot or pivots, which are transversely disposed relatively thereto, and the invention contemplates the provision of a locking device or locking devices which are operable for maintaining said pivot or pivots against rotative and longitudinal movements when the latter are in the operative positions thereof, as indicated in Figs. 1 and 2.

The beam-arm 19 of the scale-beam is illustrated removably carrying the two pivots or knife-edges 2 and 3, which are transversely disposed relatively to said beam-arm and

hence to the scale-beam B. The pivot or knife-edge 3 in practice is supported by a suitable beam-support, which is generally carried by the supporting-base of the weighing-machine, and the pivot or knife-edge 2 constitutes a bucket-support for supporting a suitable bearing carried by the bucket of such machine. In practice it is customary to drive these knife-edges or pivots into position, the idea being to hold the same tightly in place against movement. In case the knife-edge becomes dull or blunt from continued use the expenditure of considerable time and labor is necessary to remove the same for sharpening or grinding, and in case of breakage the removal of the bucket is necessary and the use of machine-tools is generally required to remove a broken knife-edge or pivot.

By my invention the knife-edges or pivots are made interchangeable, being removably carried by the scale-beam, so that should it be necessary at any time to remove any one of them for any purpose, whether it be for sharpening or to replace a broken one, the application of but slight hand-power is necessary to accomplish this result. The scale-beam is bored transversely for the reception of these knife-edges or pivots, and the latter are each provided with a cylindrical body portion, which is located within said bore, and the latter will be slightly larger in diameter than the diameter of said cylindrical body portion, the difference in diameters being such as to permit the free removal of a knife-edge, but not so great as to induce wobbling of said pivot when in its operative position. When said pivot or knife-edge is in place in the transverse bore, a locking device is employed, which is effective in action and which firmly holds said pivot or knife-edge against rotative and longitudinal movements relative to the scale-beam or support therefor. By this means a structure is provided equal in strength and rigidity to what is termed a "driven" pivot or knife-edge—that is, one that is driven or forced into or out of place.

The cylindrical body portions of the two knife-edges are shown at 4 and 5, respectively, and located within the correspondingly-shaped bores 4' and 5', formed in the

beam-arm 19 of the scale-beam B. Each of the cylindrical body portions of the knife-edges or pivots 2 and 3 is shown provided with a locking notch or recess, the locking-notch 5 for the knife-edge 2 being designated by 6 and that for the knife-edge 3 being designated by 7, (see Figs. 3 and 4,) the inner wall of which is shown curved for a purpose to be hereinafter described.

10 The knife-edges are each engaged by a locking device, which is shown consisting of a disk or locker carried by the scale-beam B. The outer face of the beam-arm 19 is shown having formed therein the recesses 8 and 9, 15 which form seats for the washers or disks 10 and 12 and which are preferably made cylindrical, the two disks fitting closely within the recesses 8 and 9, formed in the beam-arm 19. These disks are adapted to enter the locking- 20 notches 6 and 7, respectively, of the two knife-edges or pivots 2 and 3, and are also seated in the recesses 8 and 9, formed in the scale-beam, when the parts are in the operative or assembled position, as shown in Figs. 1 and 25 2, the outer faces of the two disks 10 and 12 and the beam-arm 19 being then preferably flush. The perimeter of the two disks 10 and 12 is curved, and the curvature thereof is preferably concentric with the inner curved 30 walls of the locking-notches 6 and 7, so that when said disks are in the recesses 8 and 9 of the scale-beam B said pivots or knife-edges 2 and 3, being in their operative positions, a portion of the perimeter of said disks 10 and 35 12 will be in engagement or contact with the inner curved walls of the locking-notches 6 and 7 of the two pivots or knife-edges, whereby rotative movement of the latter in either direction will be positively prevented, said 40 disks serving practically as fixed abutments.

Some suitable fastening device will be employed for holding the two disks 10 and 12 in the operative position thereof, as indicated in Figs. 1 and 2, in their recesses or seats and 45 in locked engagement with the knife-edges or pivots 2 and 3 and against lateral movement relative to the beam-arm 19, thereby also holding the pivots or knife-edges 2 and 3 against longitudinal movement. The means 50 illustrated for this purpose are the holding-screws 13 and 14, which enter centrally-formed openings in said disks, said screws

being also seated in screw-threaded openings formed in the scale-beam B.

To remove one of the knife-edges—for example, the knife-edge 2—the holding-screw 13 55 is withdrawn from place, at which time the knife-edge may be grasped by the hand and easily pulled from its bore in the scale-beam, this action also withdrawing the locking-disk 60 10 therewith. To replace the knife-edge, the locking-disk 10 will be inserted in its locking-notch 6 and the knife-edge 2 will be passed through the bore 4' and its locking-disk 10 65 into its recess or seat 8 in the scale-beam B. When the parts are in the assembled positions, as shown in Figs. 1 and 2, the screw 13 is driven into place by some suitable instrument, so that when the pivot or knife-edge 2 70 is in place in the scale-beam the locking device 10, carried by the latter, firmly holds the same against rotative and longitudinal movements.

Having thus described my invention, I claim— 75

1. The combination with a scale-beam, of a pivot removably carried by said scale-beam, said pivot having a notch formed in one side thereof; and a locking device carried by the scale-beam and seated in said notch. 80

2. The combination with a scale-beam, of a pivot removably carried thereby, said pivot having a locking-notch provided with a curved wall; and a locking device operable for engaging said curved wall. 85

3. The combination with a scale-beam, of a pivot removably carried thereby, said pivot having a locking-notch provided with a curved wall; and a circular disk for engaging said curved wall, and having the curvature 90 of said disk concentric with said curved wall, whereby said pivot will be held against rotative movement by said disk.

4. The combination with a bored and recessed scale-beam, of a pivot located in said 95 bore and provided with a locking-notch; a locker located in the recess of the scale-beam and seated in said notch; and a fastening device for holding said locker in place in said recess.

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Witnesses:

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