G. M. CONWAY.

TORSION BALANCE SCALE.

APPLICATION FILED JUNE 9, 1915.

1,169,929. Patented Feb. 1, 1916.

Fig. 1.

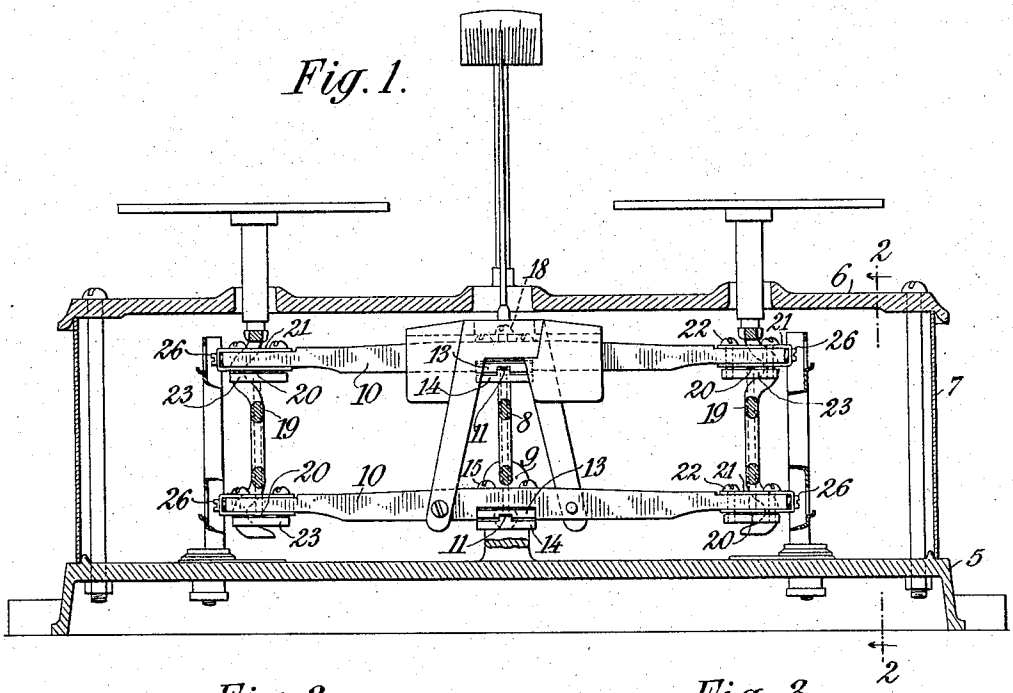


Fig. 2.

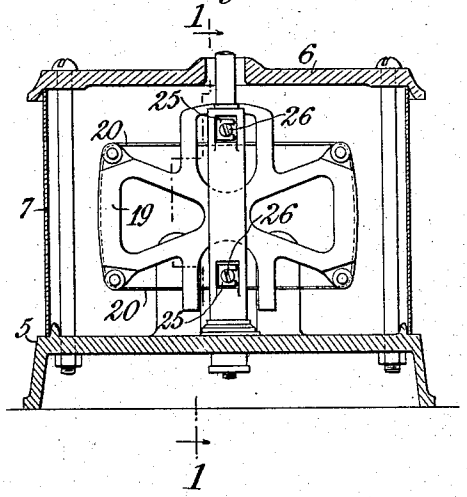


Fig. 3.

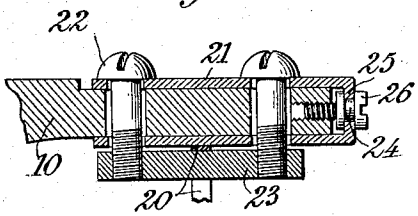
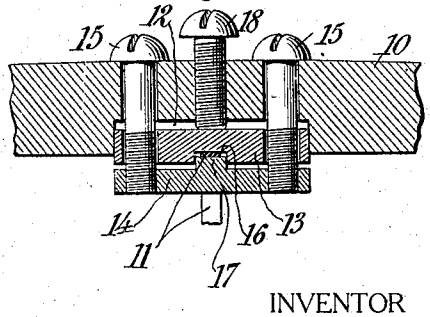


Fig. 4.



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GEORGE M. CONWAY, OF JERSEY CITY, NEW JERSEY, ASSIGNOR TO THE TORSION BALANCE COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

TORSION-BALANCE SCALE.

1,169,929. Specification of Letters Patent. Patented Feb. 1, 1916.

Application filed June 9, 1915. Serial No. 33,048.

To all whom it may concern:

Be it known that I, GEORGE M. CONWAY, a citizen of the United States, residing at Jersey City, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Torsion-Balance Scales, of which the following is a specification.

This invention relates to scales or balances of the torsion type. The connections between the various parts of the balance are afforded by means of stretched wire or ribbon which twists slightly with the rocking movements of the beam.

The wire or ribbon (hereinafter referred to by the term "wire" or "tension wire") is usually tightly stretched around a truss frame of metal, the ends of the wire being joined together in such manner that the wire is substantially continuous. These truss frames, preferably three, are connected to the scale beam, which generally is comprised of a pair of parallel beams, by clamping the wire to the beams, the trusses being normally disposed in parallel relation in vertical planes. One of the trusses, usually the centermost, is held stationary and affords the fulcrum or center support of the balance, the end trusses serving to support the scale pans.

The object of the present invention is to provide means for adjusting the clamps in such manner that both end trusses may be equidistant from the fulcrum truss, that parallel relation of the parts be assured, and interchangeable construction made feasible.

In the drawings accompanying this specification, one practicable embodiment of the invention is illustrated.

In such drawings,—Figure 1 is a longitudinal section of a balance scale equipped with the present improvement. The plane of this section is represented by the line 1—1 in Fig. 2. Fig. 2 is an end elevation of the mechanism and a cross section of the housing, taken on a plane at about the line 2—2 of Fig. 1; Fig. 3 is an enlarged longitudinal section through one of the beam ends and the wire clamping device; and Fig. 4 is a longitudinal section through the center of one of the beams showing the fulcrum wire clamping device.

In the illustration, the base is represented by the reference character 5, which is of some suitable construction. The working parts are shown housed by means of a top plate 6 resting upon a sheet metal side wall 7 which is supported by the base. The fulcrum truss 8 is shown carried by standards 9 rising from the base. A pair of beams is illustrated, designated by the reference characters 10—10. These beams are shown in parallel relation and disposed one above the other and each having its fulcrum at about its longitudinal center. The upper and lower fulcrum wires 11—11 of the fulcrum truss 8 are shown clamped to suitable tension wire seats provided on the upper and lower beams respectively. In the present illustration each beam is above the fulcrum wire to which it is clamped. An enlarged detail of the fulcrum wire clamp is illustrated in Fig. 4. The lower side of the beam at its center portion is shown recessed at 12 for receiving one of the clamp members 13, between which clamp member and the clamp member 14 the wire is held in position. Screws 15, 15, are shown movable freely through the beam and the clamp member 13, and having screw-threaded connection with the clamp member 14. These screws are shown disposed on each side of the wire seat, which seat in the present instance is at the bottom of a recess 16 toward which the wire is pressed by a rib 17 carried by the clamp member 14. A set screw 18 is shown preferably located medially of the beam and having screwthreaded connection therewith. The screw 18 cooperates with the screws 15, 15, in clamping the wire. These screws also serve for purposes of adjustment, which will be hereinafter explained.

The ends of the beams at each side are shown connected by trusses 19, each of which is provided with upper and lower wires 20 to which the ends of the beams are clamped. A detail of the clamp is illustrated in Fig. 3. The clamp is shown as comprising a slide 21 preferably formed of sheet metal and having a portion disposed on the upper side and a portion disposed on the lower side of the end of the beam. Holes are formed through the member 21 and the end of the beam for accommodating the body portion of the set-screws 22. Such holes are so formed that considerable clearance is afforded. The wire 20 is shown clamped against the under side of the slide 21 by means of a clamp plate 23 having

screwthreaded connection with the ends of the set-screws 22.

For the satisfactory working of a balance of this character it is necessary that the trusses be placed at the proper distances one from the other, the beams be maintained in parallelism, the trusses be maintained in parallel relation, and the wires be free from strains other than those incident to the balancing of the device. If, in setting up the device, it is found that one of the end trusses is out of position, or in its usual mode of operation is not in a vertical plane, the clamp as a whole on the end of the beam will be moved inwardly or outwardly of the beam until a proper position is effected. At times it is desirable to move one or both of the wire seats carried by the clamps at the end of the beam toward or from the center or fulcrum of the beam. This movement can be accomplished without unclamping the wire 20. Such inward and outward movement of the clamp is effected by means of an adjusting screw 26 engaging a screwthreaded socket in the end of the beam and having a neck portion 24 in which the edges 25 of the ends of the slide 21 are located. Adjustment in some instances is effected by one clamp and in others by the use of several of the clamps. By reference to Fig. 2 it will be seen that the end of the slide is notched so that in assembling the clamp, the screw 26 is placed in its socket and the slide 21 applied by a lateral movement. When in place, the clamp screws 22 prevent its disengagement from the adjusting screw 26. If the set-screws 22 are set down so tightly that it is impossible or difficult to effect the adjustment by means of the adjusting screw 26, of course they can be backed off to such extent that the adjustment may readily be effected without unclamping or releasing the wire.

It is desirable that the wires at each end and the center of each beam, (in the present illustrations the wires 20—20 and 11) shall, when the trusses are of uniform height, be on the same plane, or that their clamping seats shall be on the same plane. It is very difficult in making interchangeable parts, to produce the clamping seats for the wires in exactly the same plane. The adjustment of the clamp in the manner shown in Fig. 4 is for effecting the adjustment and alinement of the clamp faces. It will be seen that by releasing or advancing the screw 18 the clamping face for the wire 11 may be raised or lowered. Adjusting means is thereby provided for adjusting the fulcrum or intermediate tension wire seat in a direction perpendicular to the beam and the plane of the end seats. In some instances it may be found necessary to tilt the wire or clamp seat, in which case one or the other of the screws 15 may be set down harder than the other, as will be apparent, to rock the clamp seat into the desired position.

It will be apparent that as each end of each beam is provided with means for adjusting the clamp or wire seat longitudinally of the beam, that the adjustment of the end trusses into their proper parallel vertical positions may be readily accomplished, irrespective of the faults which may occur in the parts, particularly the beams, when manufactured by the interchangeable system or when manufactured at different times.

Although one embodiment of the invention is illustrated, yet it will be apparent that changes may be made within the scope of the claims without departing from the spirit of the invention.

I claim as my invention:—

1. In a balance, a pair of parallel beams, a pair of trusses each having on each of two opposite sides a tension wire, tension wire clamps carried by the ends of the beams, and means for adjusting one of the said clamps longitudinally of the beam carrying the same for adjusting the trusses into parallel relation.

2. In a balance, a pair of parallel beams, a pair of trusses each having on each of two opposite sides a tension wire, tension wire clamps carried by the ends of the beams, and means for severally adjusting the clamps longitudinally of the beams for adjusting the trusses into parallel relation.

3. In a balance, a pair of parallel beams, a fulcrum truss having on each of two opposite sides a tension wire, the beams being medially connected to said wires respectively, a pair of end trusses each having on each of two opposite sides a tension wire, tension wire clamps carried by the ends of the beams, and means for adjusting one of the said clamps longitudinally of the beam carrying the same for adjusting the position of the end truss relatively to the fulcrum truss.

4. In a balance, a pair of parallel beams, a fixed fulcrum truss having on each of two opposite sides a tension wire, the beams being medially connected to said wires respectively, a pair of end trusses each having on each of two opposite sides a tension wire, tension wire clamps carried by the ends of the beams, and means for severally adjusting the clamps longitudinally of the beams for adjusting the position of the end trusses relatively to the fulcrum truss.

5. In a balance, a pair of parallel beams, a fixed fulcrum truss having on each of two opposite sides a tension wire, the beams being medially connected to said wires respectively, a pair of end trusses each having on each of two opposite sides a tension wire, tension wire clamps carried by the ends of the beams, means for severally adjusting the

clamps longitudinally of the beams for adjusting the position of the end trusses relatively to the fulcrum truss, a tension wire clamp carried by each beam for engaging the fulcrum truss wires, and means for moving the said clamps vertically in the general plane of such beams.

6. In a balance, the combination of three trusses each carrying a tension wire, a beam, tension wire clamps carried by the ends of the beam, a tension wire clamp carried by the center of the beam, and means for vertically adjusting the latter clamp.

7. In a balance, the combination with three trusses each carrying a tension wire, a beam, tension wire clamps carried by the ends of the beam, means for adjusting one of said clamps longitudinally of the beam, a tension wire clamp carried by the center of the beam, and means for vertically adjusting said clamp.

8. A beam for a torsion balance, said beam having a tension wire seat at each end, an intermediate tension wire seat carried by the beam, means for clamping tension wires to the said seats, and means for adjusting the said intermediate tension wire seat in a direction perpendicular to the plane of the end seats.

9. A beam for a torsion balance, said beam having a tension wire seat at each end, an intermediate tension wire seat carried by the beam, means for clamping tension wires to the said seats, means for adjusting the said intermediate tension wire seat in a direction perpendicular to the plane of the end seats, and means for individually adjusting the end tension wire seats longitudinally of the beam and toward and from the intermediate tension wire seat.

In witness whereof, I have hereunto signed my name in the presence of two subscribing witnesses.

GEORGE M. CONWAY.

Witnesses:
THOMAS F. WALLACE,
FRED WHITE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."