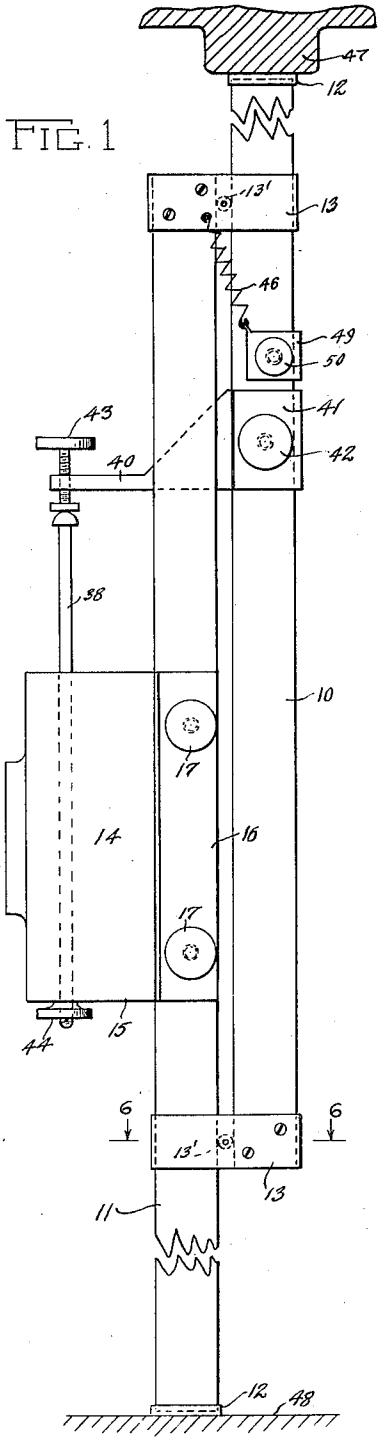
W. J. BARRETT.

DEFLECTION INDICATOR.

APPLICATION FILED AUG. 25, 1921.

1,427,773. Patented Sept. 5, 1922.

FIG. 1



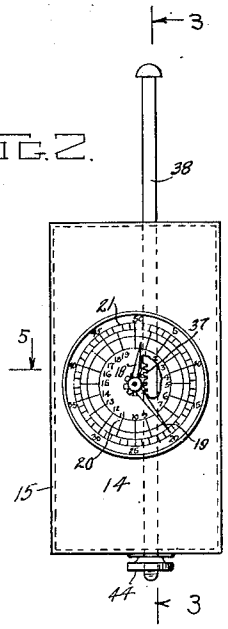


FIG. 2.

FIG. 3.

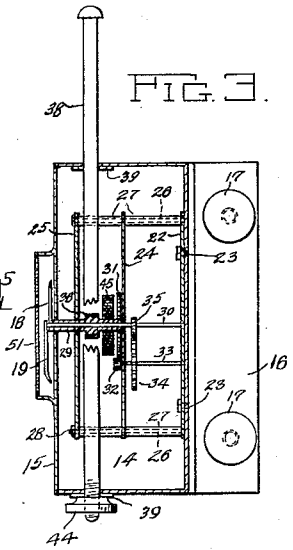


FIG 4

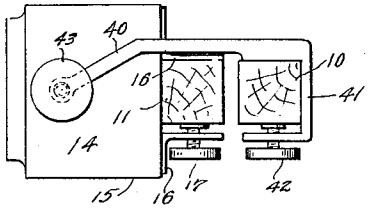


FIG. 5.

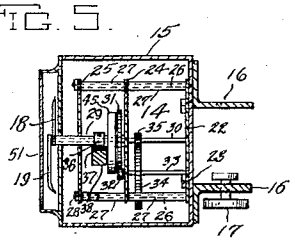
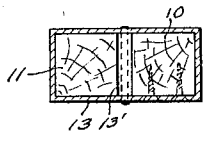


FIG 6



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Patented Sept. 5, 1922. 1,427,773

UNITED STATES PATENT OFFICE.

WILLIAM J. BARRETT, OF BRIDGEPORT, CONNECTICUT.

DEFLECTION INDICATOR.

Application filed August 25, 1921. Serial No. 495,276.

To all whom it may concern:

Be it known that I, WILLIAM J. BARRETT, a citizen of the United States, residing at Bridgeport, county of Fairfield, State of Connecticut, have invented an Improvement in Deflection Indicators, of which the following is a specification.

This invention relates to indicators or measuring devices and more particularly to a device for measuring the deflection of beams or floors under load.

It is an object of this invention to provide a device of this type which may be easily and quickly applied under the beam or floor, the deflection of which is to be measured, regardless of the height thereof and in which, under these conditions, the pointer or pointers may be quickly set at zero.

It is a further object of this invention to provide a device which will efficiently and accurately measure the amounts of deflection but which will at the same time be simple in construction comprising comparatively few parts and will, therefore, be easy and cheap to manufacture and not liable to get out of order.

In carrying out my invention I provide a pole or bar comprising two sections so connected together that they may slide longitudinally relatively to each other with spring means tending to separate the outer ends thereof, a suitable indicating means adjustably mounted on one of said sections and means mounted on the other section for operating the indicating means.

Referring to the accompanying drawings,

Fig. 1 is a side elevation showing my device in indicating or measuring position.

Fig. 2 is a front elevation of the indicating means.

Fig. 3 is a transverse sectional elevation, substantially on the line 3—3, Fig. 2.

Fig. 4 is a top plan view of my device.

Fig. 5 is a transverse section substantially on the line 5—5, Fig. 2, and

Fig. 6 is a transverse section on line 6—6, Fig. 1.

The pole or bar comprises two sections 10 and 11, the outer or upper and lower ends of which, are preferably protected by suitable metal caps 12. These sections may be made of any suitable material but are preferably made of pieces of wood substantially rectangular in cross section and are connected so as to be longitudinally slidable relatively to each other. Various means may be provided for so connecting said sections but I prefer the means disclosed in the drawing, which comprises two guiding members 13 preferably formed of sections of rectangular metal tubing through which the two sections of the bar extend. One of these guides is secured to each section and the other section has sliding fit therewith, the two sections being separated a small amount by means of an antifriction roller 13′ rotatably mounted in the guide so as to allow the sections to freely slide relatively to each other.

Upon one of the sections, as 11, preferably between the two guides 13, I adjustably mount an indicating and measuring device 14. This device comprises a casing 15 enclosing the indicating mechanism and is provided on the rear vertical wall thereof with spaced angle members 16 which are adapted to straddle the section 11 and one of them is provided with one or more clamping screws 17 for clamping the casing in any desired position on the said section. Within the casing is mounted the indicating or measuring mechanism comprising a short pointer 18 and long pointer 19, scales 20 and 21 for the pointers, respectively, and suitable operating mechanism for these pointers. A sheet metal plate 22 is secured by any suitable means such as screws 23 to the back wall of the casing 15, and parallel with and spaced from this plate and from each other are mounted two similar plates 24 and 25. The plates 24 and 25 are secured to the plate 22 by suitable bolts or studs 26 and are retained in separated position by tubular spacing sleeves 27 threaded upon the bolts or studs 26, the whole being secured in assembled relation by nuts or other suitable means 28 on the members 26. The short pointer 18 is secured on the tubular sleeve 29 concentric with a rod or shaft 30 upon which the long pointer is mounted. The rod 30 is mounted to turn in the plates 22 and 24, and the sleeve 29 is mounted to turn on this rod. The sleeve 29 also has mounted thereon a gear 31 meshing with a pinion 32 mounted on a shaft 33 carrying another gear 34 which in turn meshes with a pinion 35 on the rod 30. Also mounted on the sleeve 29 is a gear 36 which meshes with a rack 37 on the rod 38 extending through the end walls of the casing 15 and slidably mounted therein. If desired, the bearings

for this rod in the ends of this casing may be lengthened and strengthened by suitable plates 39 secured to the casing by any suitable means such as solder. The gear 36 is of such a size that one inch movement of the rod 38 causes one revolution of the short pointer 18 and the ratios of the gearing 31, 32, 34 and 35 is such that one revolution of the short pointer will give twenty revolutions of the long pointer. It will, therefore, be apparent that, if the inner scale 20 for the short pointer is divided into twenty equal divisions, and the outer scale 21 for the long pointer is divided into fifty equal divisions, a movement of the point of the long pointer over one of these divisions will indicate a movement of one-thousandth of an inch of the rod 38 or the same longitudinal relative movement of the sections 10 and 11, as the section 10 is provided with means for sliding the rod 38 upon relative longitudinal movements of the sections 10 and 11. This means comprises a finger 40 provided with a bracket portion 41 embracing the section 10 and provided with a clamping screw 42 for securing it in any desired position upon the section 10, the finger extending to one side of the section 11 and provided with an adjustable screw 43 mounted in the free end thereof contacting at one end with the end of the rod 38. The other end of the rod 38 is provided with suitable adjusting means preferably a thumb nut 44 threaded on this rod and bearing against the end of the casing 15. A coil spring 45 is mounted within the casing and secured at one end to the sleeve 29 and tends to move the pointers counter-clockwise to raise the rod 38 and hold it in contact with the end of the screw 43 and the adjusting screw 44 against the end of the casing. It will, therefore, be apparent that by manipulating the screw 44 the pointers may be set at zero.

Spring means 46 are provided tending to separate the outer ends of the sections 10 and 11 and to hold the end of the section 10 against the beam or floor 47, the deflection of which is to be measured, and any suitable base 48. Spring 46 is preferably secured at one end to the upper guide 13 and at the other end to a clamp 49 which may be adjustably secured to the section 10 by means of a clamping screw 50. The pointers are preferably protected by a suitable glass 51.

In operation, the ends of the sections 10 and 11 of the pole or bar are placed against a suitable support, as base 48, and the under side of the beam or floor 47, the deflection of which is to be measured. The pointers 18 and 19 are then set at zero by manipulating the adjusting screw 44. The finger 40 is then adjusted upon the section 10 a short distance from the end of the rod 38, and the screw 43 adjusted to contact with the end of this rod. The beam or floor is now loaded and the amount of deflection will be indicated by the pointers.

It will be apparent from the foregoing description that the device is simple in construction comprising comparatively few parts and that it will be comparatively cheap to manufacture and easily assembled. Also it will, therefore, not be liable to get out of order and will remain accurate on long continued operation as the wear between the operating parts will be small. It will further be apparent that the device may be quickly and easily placed in position and adjusted.

Having thus set forth the nature of my invention, what I claim is:

1. A device of the class described including a bar adapted to be inserted between two elements and comprising two sections slidable longitudinally relatively to each other, an indicator carried by one of said members, and positively acting means carried by the other member for operating said indicator, said means being adjustable relative to the member and longitudinally thereof.

2. A device of the class described including a bar adapted to be inserted between two elements and comprising two sections slidable longitudinally relatively to each other, means connecting said sections and comprising a guide secured to each section and slidable on the other section, an indicator carried by one of said sections, and positively acting means carried by the other section for operating said indicator, said means being adjustable relative to the section and longitudinally thereof.

3. A device of the class described including a bar adapted to be inserted between two elements and comprising two sections slidable longitudinally relatively to each other, means connecting said sections and comprising a guide secured to each section and slidable on the other section, antifriction rollers between the sections arranged to separate the same and rotatably mounted in said guides, an indicator carried by one of said sections, means carried by the other section for operating the indicator, and means tending to move said sections longitudinally of each other to separate the outer ends thereof.

4. A device of the class described including a bar adapted to be inserted between two elements and comprising two sections slidable longitudinally relatively to each other, a spring secured to one of said sections and adjustably secured to the other section and tending to move said sections longitudinally and hold them in contact with said elements, an indicator carried by one of said sections, and means carried by the other section for operating said indicator.

5. A device of the class described includ-

ing a bar adapted to be inserted between two elements and comprising two sections slidable longitudinally relatively to each other, an indicating device mounted on one of said sections including a rotatable pointer and a pinion for rotating said pointer, a slidable rack cooperating with said pinion, means carried by the other section for sliding said rack, and means for adjusting the rack longitudinally of the bar.

6. A device of the class described comprising a bar composed of two sections slidable longitudinally relatively to each other, an indicating device carried by one of said sections comprising a supporting means, a pointer mounted in said supporting means, a rod slidably mounted in said supporting means and movable longitudinally of said bar, driving means between the rod and pointer, and means carried by the other section of the bar for sliding the rod.

7. A device of the class described comprising a bar composed of two sections slidable longitudinally relatively to each other, an indicating device carried by one of said sections comprising supporting means, a plurality of pointers mounted in said supporting means, and means operated by the other section of the bar for moving the pointers different distances at a given ratio to each other on a given movement of said section.

8. A device of the class described comprising a bar composed of two sections slidable longitudinally relatively to each other, an indicating device carried by one of said sections comprising a supporting means, a plurality of pointers mounted in said supporting means, a rod slidably mounted in said supporting means and movable longitudinally of the said bar, driving means between the rod and pointers arranged to move the pointers different amounts in a given ratio upon a given movement of said rod, and means carried by the other section of the bar for moving the rod.

9. A device of the class described comprising a supporting means, a plurality of pointers mounted in said supporting means, scales for said pointers, a rod slidably mounted in said supporting means, and driving means between the rod and the pointers arranged to move them different amounts in a given ratio upon a given movement of said rod.

10. A device of the class described comprising a supporting means, a plurality of pointers rotatably mounted in said supporting means, dials for said pointers, a rod slidably mounted in said supporting means and provided with a rack, and gearing between said rack and said pointers arranged to move them different amounts on a given movement of the rod.

11. A device of the class described comprising a supporting means, a pointer mounted in said supporting means, a rod slidably mounted in said supporting means, driving means between the rod and the pointer, a spring tending to move the rod in one direction, and adjusting means connected with said rod and adapted to move it in the opposite direction to set the pointer at zero.

In testimony whereof I affix my signature.

WILLIAM J. BARRETT.