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MOTION TRANSMITTING MECHANISM

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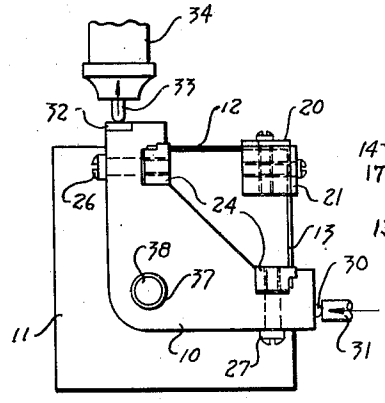


FIG 1

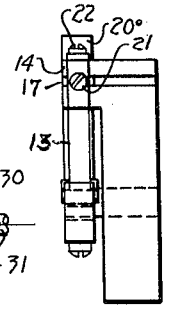


FIG 2

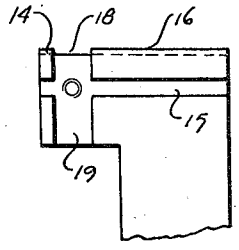


FIG 5

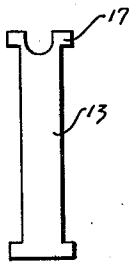


FIG 3

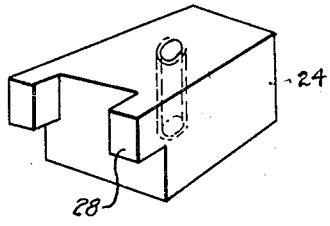


FIG 4

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MOTION TRANSMITTING MECHANISM

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3 Claims. (Cl. 74—469)

This invention relates to motion transmitting mechanism.

One object of the invention is the provision of a motion transmitting device adapted to transmit motion in one direction to equal or proportionate motion in another direction and embodying supporting and supported members which are connected together by a pair of widely diverging flat spring blades providing for rotational movement of the supported member while eliminating all lost motion and avoiding the possibility of play in the parts.

Another object of the invention is the provision of a device of the character mentioned in which the two members are connected by two spring blades diverging from the supporting member at a wide angle to one another, the opposite ends of the blades being connected rigidly to the two members and determining the fulcrum axis of the supported member at the line of intersection of the planes of the spring blades.

Other objects and advantages of the invention will be apparent from the following description, the appended claims, and the accompanying drawing, in which:

Fig. 1 is a side elevation of a motion transmitting device embodying the present invention;

Fig. 2 is a side elevation of the same;

Fig. 3 is a detail view of one of the spring blades;

Fig. 4 is a perspective detail view of one of the blade retaining blocks; and

Fig. 5 is a detail view of the end of the stationary or supporting member.

Referring more particularly to the drawing by reference numerals, Figs. 1 to 5 inclusive show a motion transmitting device in which a supported member 10, herein shown as an angle lever, is mounted on a supporting member 11, to which it is connected by a plurality of widely diverging, flat spring blades 12 and 13, preferably formed of steel and having their opposite ends secured rigidly to the members 10 and 11. The supporting member 11 is preferably provided with an offset integral portion 14 having shallow slots 15 and 16 the depth of which corresponds to the thickness of the spring blades 12 and 13, the width of the slots corresponding to the width of the side projections 17 provided on the ends of the spring blades as shown in Fig. 3. Additional slots 18 and 19, which are also of a depth corresponding to the thickness of the spring blades, are provided in the offset portion 14 of the support and receive end portions of the spring blades so that the outer surfaces of the spring blades are substantially flush with the outer surfaces of the sides of the projecting portion 14. Clamping blocks 20 and 21 hold the ends of the spring blades securely in place, the blocks 20 and 21 being retained by screws 22 which are threaded into the offset portion 14 of the support. With the side projections 17 of the springs fitting tightly in the slots 15 and 16 and the end portions of the spring blades fitting tightly in the slots 18 and 19 the springs are prevented from moving endwise or from swinging in the direction of their own planes.

The opposite ends of the spring blades 12 and 13 are securely held by means of clamp blocks 24 and 25 held by screws 26 and 27 in the supported member 10. The supporting blocks 24 have projections 28 which engage the lateral projections on the ends of the spring blades, and the blocks 24 fit within the recesses in the supported member 10 tightly so as to prevent any movement of the clamped ends of the spring blades at their areas of attachment.

The two spring blades 12 and 13 extend at a wide angle with respect to one another, preferably an angle of the order of 90°, and provide a support for the member 10 affording rotational movements of the member 10, through small angles, about an axis or fulcrum lines determined by the line of intersection of the two planes of the two spring blades, the member 10 being supported for very free movement about this axis when the spring blades are in their normal straight position. In view of the rigid connection between the ends of the spring blades and the supporting and supported members, there is no lost motion present, the movement of the supported member 10 taking place in such manner as to truly produce a proportionate movement in one direction at one end of the member as another end of the member is moved.

Near one end of the supported member 10 the latter has fixed thereto a hardened ball thrust member 30 adapted to be engaged and moved by an operating member 31 which moves horizontally as viewed in Fig. 1 and which may be the operated member of a gaging device adapted for checking sizes of specimens. At a remote point, the member 10 is provided with a hardened thrust surface 32 which produces a vertical movement of the gage plunger 33 of a suitable gaging device 34 having an indicating mechanism of any suitable character. An indicating mechanism such as is disclosed in the prior application of Aller and Markwick Serial No. 162,085 filed September 2, 1937, may be employed.

The device is not intended to provide for movement of the supported member 10 through wide angles such as unduly deflect and bend the spring blades 12 and 13, and to limit the motion of the member 10, the latter is provided with a hole 37 somewhat larger than a stud 38 which is secured in the member 10 and which projects into the hole, the distance between the sides of the stud 38 and the sides of the hole determining the degree of movement permitted.

As will now be apparent, the operating member 31 moves in a direction at substantially 90° to one of the blades and substantially parallel to the other blade, while the plunger 33 of the gaging device is operable in a direction at substantially 90° to one of the blades and substantially parallel to the other, so that the reaction and thrust forces to which the supported member is subjected are effectively assumed without undue strain or undue deflection or bending in the blades, and a very accurate reproduction of a proportionate movement is provided for.

While the form of apparatus herein described constitutes a preferred embodiment of the invention, it is to be understood that the invention is not limited to this precise form of apparatus, and that changes may be made therein without departing from the scope of the invention which is defined in the appended claims.

What is claimed is:

1. A motion transmitting device comprising a fixed member and a lever member which is adapted to transmit movement applied to one portion thereof to proportionate movement at another portion thereof, and means for mounting said lever member for small swinging movement about a fixed axis of rotation comprising a pair of flat, flexible blades each rigidly connected at one end thereof to one of said members and each rigidly connected at the other end thereof to the other of said members and diverging from the fixed member to the lever member at a wide angle to determine the fulcrum axis of the lever member at the point of intersection of the planes of said flat blades.

2. A motion transmitting device adapted to transmit movement applied to one portion thereof to proportionate movement at another portion thereof, comprising a supporting member, a supported member, and a pair of flat, thin, flexible, normally straight blades of equal length diverging from one another at a wide angle and mounting said supported member for small swinging movement on said supporting member, said blades each having one end thereof rigidly connected to one of said members at locations widely spaced apart and having the other end thereof rigidly connected to the other of said members at locations close together, said blades providing a fixed axis of rotation of the supported member at the same side of all of the connection locations and adjacent an end of each of the blades, actuating means operable at substantially 90° to one of said blades for transmitting motion to one portion of said supported member, and means operable in a direction substantially 90° from the other of said blades and receiving motion from another portion of said supported member proportionate to the movement of said actuating means.

3. A motion transmitting device adapted to transmit movement applied to one portion thereof to proportionate movement at another portion thereof, comprising a supporting member, a supported member, and a pair of flat, thin, flexible, normally straight blades of equal length diverging from one another at an angle of the order of 90°, said blades mounting said supported member for small swinging movement on said supporting member and each having one end thereof rigidly connected to said supported member at locations widely spaced apart and having the other end thereof rigidly connected to the supporting member at locations close together and providing a fixed axis of rotation of the supported member substantially at the point of intersection of the planes of said flat blades, actuating means operable at substantially 90° to one of said blades for transmitting motion to one portion of said supported member, and means operable in a direction substantially 90° from the other of said blades and receiving motion from another portion of said supported member proportionate to the movement of said actuating means.

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