No. 881,312 PATENTED MAR. 10, 1908.

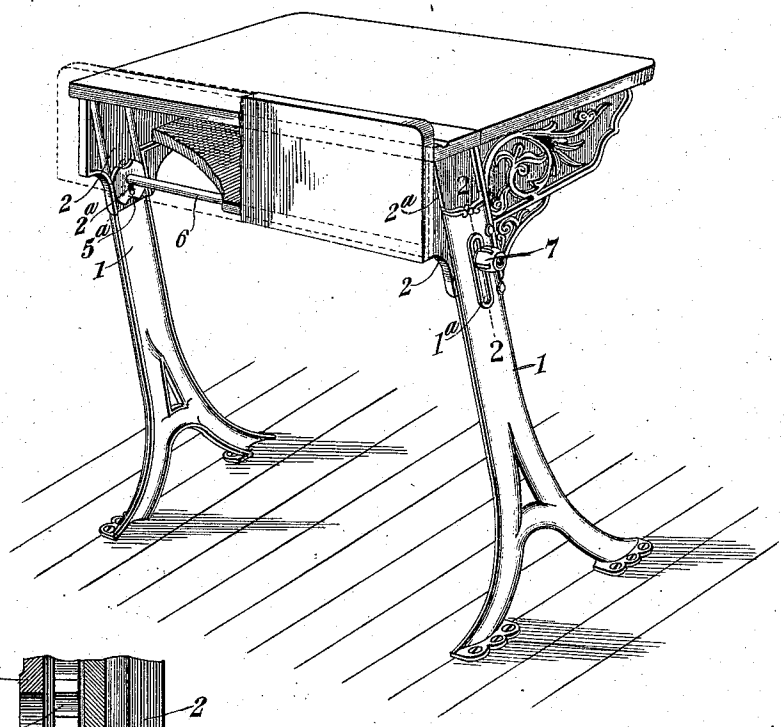
J. F. FIELD.

ADJUSTABLE DESK.

APPLICATION FILED MAR. 11, 1907.

2 SHEETS—SHEET 1.

Fig. 1.



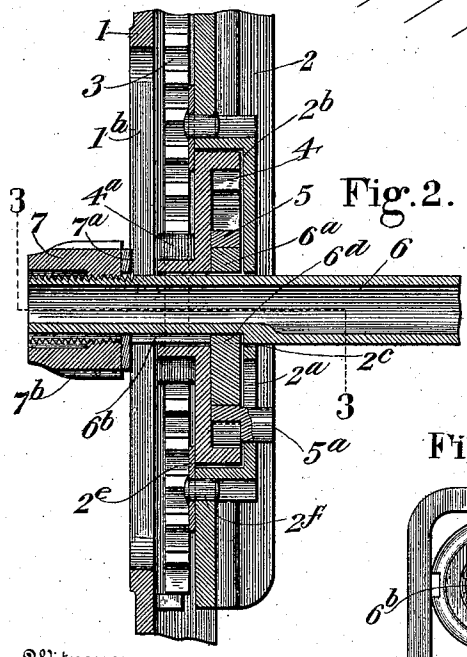


Fig. 2.

Fig. 3.

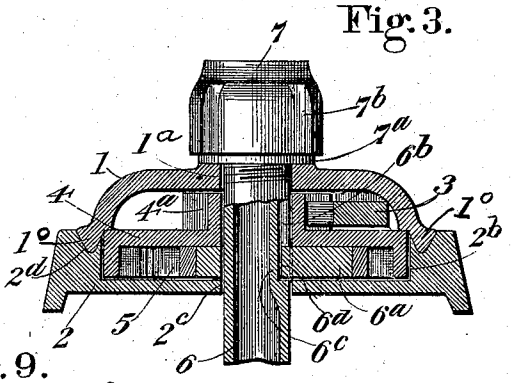
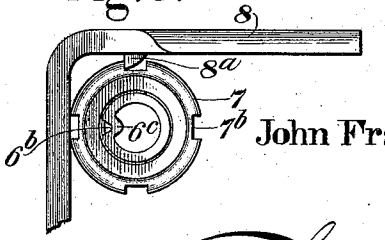


Fig. 9.



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2 SHEETS—SHEET 2.

Fig. 4.

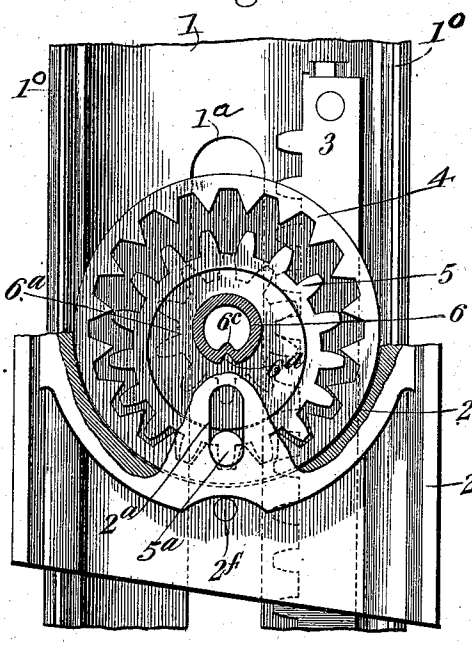


Fig. 5.

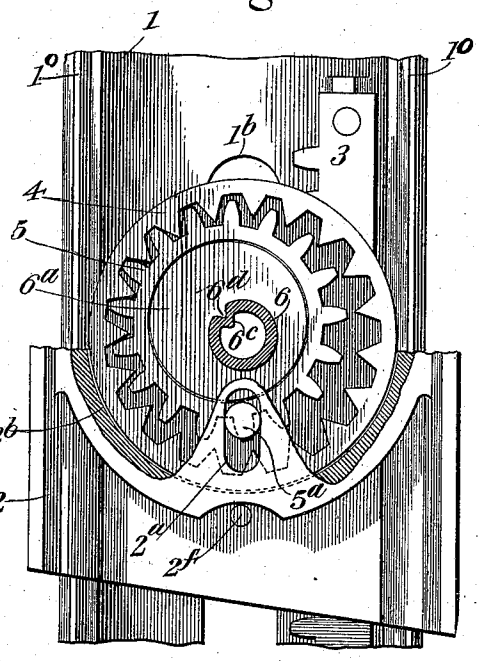


Fig. 6.

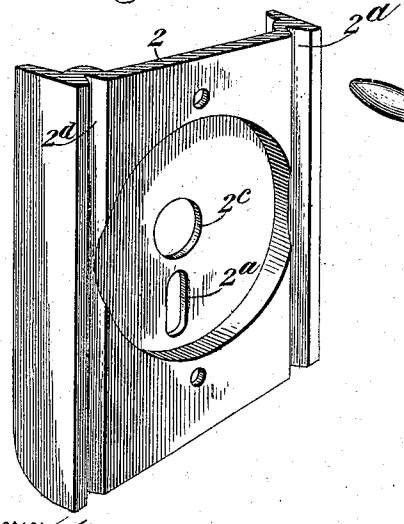


Fig. 7.

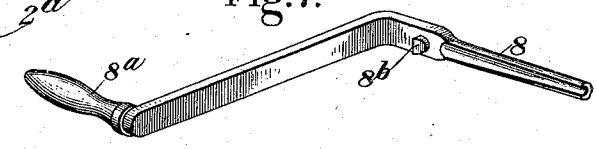
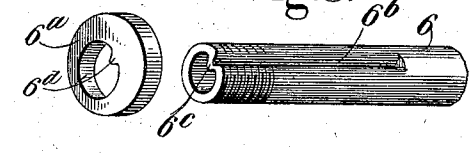


Fig. 8.



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UNITED STATES PATENT OFFICE.

JOHN FRANKLIN FIELD, OF IONIA, MICHIGAN, ASSIGNOR TO E. H. STAFFORD MANUFACTURING COMPANY, OF IONIA, MICHIGAN, A CORPORATION OF ILLINOIS.

ADJUSTABLE DESK.

No. 881,312. Specification of Letters Patent. Patented March 10, 1908.

Application filed March 11, 1907. Serial No. 361,752.

To all whom it may concern:

Be it known that I, JOHN F. FIELD, of Ionia, in the county of Ionia and State of Michigan, have invented certain new and useful Improvements in Adjustable Desks; and I hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form part of this specification.

This invention is a novel device for adjusting one sliding member upon another and holding the same when adjusted. It is particularly designed for use in connection with so-called adjustable school furniture, such as chairs and desks; and its objects are to provide a device whereby the adjustments can be made easily and quickly; which will be practically self-locking so that the parts will remain as adjusted without manipulation of the locking device or bolts, and which, when applied to desks or chairs, can be operated from either side.

I will now explain the invention with reference to the accompanying drawings which illustrate it as more particularly adapted to an adjusting desk; and will refer to the claims for concise summaries of the parts and features of the invention for which protection is desired.

In said drawings—Figure 1 is a perspective view of a desk provided with the improved adjusting devices and partly broken away. Fig. 2 is an enlarged central vertical section through one of the adjusting devices. Fig. 3 is a transverse section on line 3—3, Fig. 2. Figs. 4 and 5 are views showing the interior construction of the device, member 2 being partly broken away. Fig. 6 is a detail view of member 2. Fig. 7 is a perspective view of the adjusting wrench lever. Fig. 8 is a detail view of the shaft and eccentric. Fig. 9 illustrates the use of the wrench lever.

1 and 2 designate members which are relatively slidable or adjustable longitudinally. The member 1 is shown as one of the standards of a school-desk; and member 2 is shown as one of the supporting side frames of such desk. The member 1 may be provided with longitudinal guide-ribs 1^c adapted to engage corresponding guide grooves 2^d on member 2 so as to prevent lateral displacement of said members. Member 1 is provided with a rack 3 which is engaged by a spur-pinion 4^a which may be formed on, or rigidly connected to, an internal gear 4, within which internal gear is a small annular pinion 5 which is loosely mounted upon an eccentric 6^a on a rotatable shaft 6, which extends axially through the gears 4 and 4^a and is supported thereby, and as shown projects through a slot 1^a in member 1, the slot extending parallel with rack 3.

The eccentric 6^a is keyed to the shaft 6 which is preferably tubular and has a key-way 6^b formed near its outer end, which key-way may be formed by kinking or bending the tube inwardly as shown so that the inwardly projecting portion of the bend forms an internal projection 6^b in the end of the hollow shaft. The eccentric 6^a may be formed with an inwardly projecting lug or key 6^d engaging the key-way 6^b.

The parts are so proportioned that the annular gear 5, mounted loosely on eccentric 6^a will be in mesh with the gear 4 only at the point adjacent the greatest projection of the cam 6^a; and by turning shaft 6 the gear 5 will be caused to travel around and within the internal gear 4. The gear 5 however is kept from rotating with the eccentric 6^a by means of a stud 5^a which projects into a slot 2^a in member 2, when the latter is in position relative to member 1 as shown in Fig. 2.

The gears and rack-bar are inclosed between the members 1 and 2 which are suitably recessed for that purpose, and member 2 has an internal recess 2^b for the reception of the gear 4, and also has an aperture 2^c for the passage of the shaft 6. The internal gear 4 may be loosely confined in this recess by means of washers 2^e secured to member 2 by rivets 2^f or other suitable fastening devices. On a desk or chair there would be a pair of these adjusting devices at each side and the shaft 6 is made continuous and extends from one adjusting device to the other as indicated in Fig. 1, so that both the devices can be adjusted simultaneously.

The shaft can be held in position by means of nuts 7 screwed on the threaded outer ends of the shaft and preferably washers 7^a are strung on the shaft between the nuts and member 1, said washers being keyed to the shaft as shown so as to rotate therewith. The nuts are preferably made round and provided with notches 7^b by which they can be engaged by a suitable wrench.

Fig. 7 shows a crank lever used for rotating the shaft 6; said lever being roughly L-shaped and having an angular portion 8 adapted to enter the end of shaft 6 and hav-

ing a handle 8^a by which the lever can be turned so as to rotate the shaft 6, and it is provided at its bend with a tooth 8^b by which the lever can be used as a nut-wrench as indicated in Fig. 9.

When the parts are in position, if the shaft 6 be turned by lever 8 or in other suitable manner, the eccentric will impart an oscillating and reciprocating motion to gear 5. As this gear is kept from rotating by the pin 5^a and slot 2^a, during part of the rotation of the shaft 6, no movement will be imparted to gear 4; but during the remainder of the rotation of shaft 6, pin 5^a and slot 2^a permit the gear 5 to partially rotate with the shaft while the pin 5^a travels from one end of the slot to the other, which limited rotary movement will be imparted from shaft 6 through eccentric 6^a and gear 5 to the internal gear 4. In other words, during the travel of the pin 5^a from one end of the slot to the other, gear 4 will be momentarily locked to and rotate with shaft 6, consequently when gear 4 rotates, pinion 4^a must rotate therewith, and as it is in engagement with the rack 3 the member 2 will be moved up or down on member 1 or vice versa according to which is the fixed and which is the movable member. By continuing to rotate shaft 6 the movable member may be adjusted to any desired position on the relatively fixed member. Starting with the parts in the position shown in Fig. 4, rotation of the shaft 6 clockwise causes a corresponding rotation of the eccentric 6^a. The gear 5 being loosely mounted on the eccentric, engages with the teeth of the internal gear 4, moving upward to the position shown in Fig. 5, thus causing the gear 4 to rotate in the same direction. The rotary movement of the gear 4 is variable with respect to the rotary movement of gear 5, and is greatest when the gear 5 is rotating from the position shown in Fig. 5 to a corresponding position on the opposite side of the vertical and is practically nothing for the remainder of the cycle. The rotary movement of the gear 4 causes the rack 3 to move vertically on account of the gear 4^a meshing therewith. In the position indicated in Fig. 4 the slot and pin permit the annular gear to shift idly with the eccentric without imparting any rotary motion to the internal gear 4, but when the parts are in the position shown in Fig. 5, the pin and slot allows the gear 5 to partially turn with the eccentric which causes the internal gear to also partly turn, and thus through pinion 4^a move member 2 up or down relatively to member 1 by reason of the movement of pinion 4^a with rack 3.

At all times the eccentric and the pin and slot constitute an automatic lock for the gears 4 and 5, preventing the parts dropping by gravity, or the internal gear rotating under the weight of the superposed parts and the device will stay wherever adjusted.

The bolts 6 can be tightened to prevent any one tampering with the adjustment. When the device is applied to desks or chairs the shaft 6 forms a brace and tie between the opposite standards, and the adjustment can be made from either end of the shaft, or either side of the desk. All the adjusting parts are protected and substantially concealed, and there is no danger of the adjusting device giving way and letting the upper part of the desk or seat drop.

Having described my invention what I claim as new and desire to secure by Letters Patent is:

1. The combination of opposed members, a rack on one member, a pinion connected with the other member and engaging said rack, an internal annular gear connected with said pinion, a shaft extending axially through said pinion and gear, an annular gear eccentrically mounted within the internal gear, and means for operating said annular gear.

2. The combination of a movable member, a rack on said member, a pinion engaging said rack, an internal annular gear connected with said pinion, a shaft extending axially through said pinion and gear, an annular gear within the internal gear, an eccentric on the shaft supporting said annular gear, and means for preventing rotation of said annular gear.

3. In an adjusting device, the combination of a movable member, a rack thereon, an internal gear having a pinion adapted to engage the rack, a rotatable eccentric within the internal gear, an annular gear mounted on said eccentric and engaging the internal gear, and means for preventing rotation of said annular gear.

4. In an adjusting device, the combination of opposite members, a rack on one member, a pinion rotatably connected with the other member and engaging said rack, an internal gear connected with said pinion, a rotatable eccentric within the toothed portion of such internal gear, an annular gear mounted on said eccentric and engaging the internal gear, and a pin and slot for preventing rotation of said annular gear.

5. The combination of opposed members, one of said members having a rack on its inner face and the other of said members having an annular recess, an internal gear in said recess, a pinion connected with said gear engaging said rack, a shaft extending through said pinion, an annular gear mounted on an eccentric on said shaft and meshing with the internal gear, and means for preventing rotation of the annular gear.

6. The combination of opposed members, one of said members having a slot and a rack parallel with the slot and the other of said members having an annular recess, an internal gear in said recess, a pinion connected

with said gear and engaging said rack, a shaft extending through said pinion, an eccentric on said shaft, an annular gear mounted on said eccentric and meshing with the internal gear, and a pin and slot for preventing rotation of the annular gear.

7. The combination of opposed members movable one upon the other, a rack attached to one member, a pinion rotatably connected with the other member and engaging said rack, an internal gear connected with said pinion, a rotatable shaft extending axially through said gear, an eccentric on said shaft, an annular gear on said eccentric within and meshing with the internal gear, a nut on the threaded outer end of said shaft, and means for preventing rotation of said annular gear.

8. The combination of opposed members movable one upon the other, one of said members having a slot and the other a recess, a rack attached to the slotted member, a pinion rotatably connected with the other member and engaging said rack, an internal gear connected with said pinion and confined in the recess of said members, a shaft extending axially through said gear and through the slot in the first member, an eccentric on said shaft, an annular gear on said eccentric within and meshing with the internal gear, and means for preventing rotation of said annular gear.

In testimony that I claim the foregoing as my own, I affix my signature in presence of two witnesses.

JOHN FRANKLIN FIELD.

Witnesses:

WINNIE FREEMAN,

LAWRENCE W. SMITH.