No. 730,623. PATENTED JUNE 9, 1903.

R. P. ELLIOTT.

ADJUSTABLE FURNITURE.

APPLICATION FILED DEC. 15, 1900.

NO MODEL. 2 SHEETS—SHEET 1.

FIG. 1.

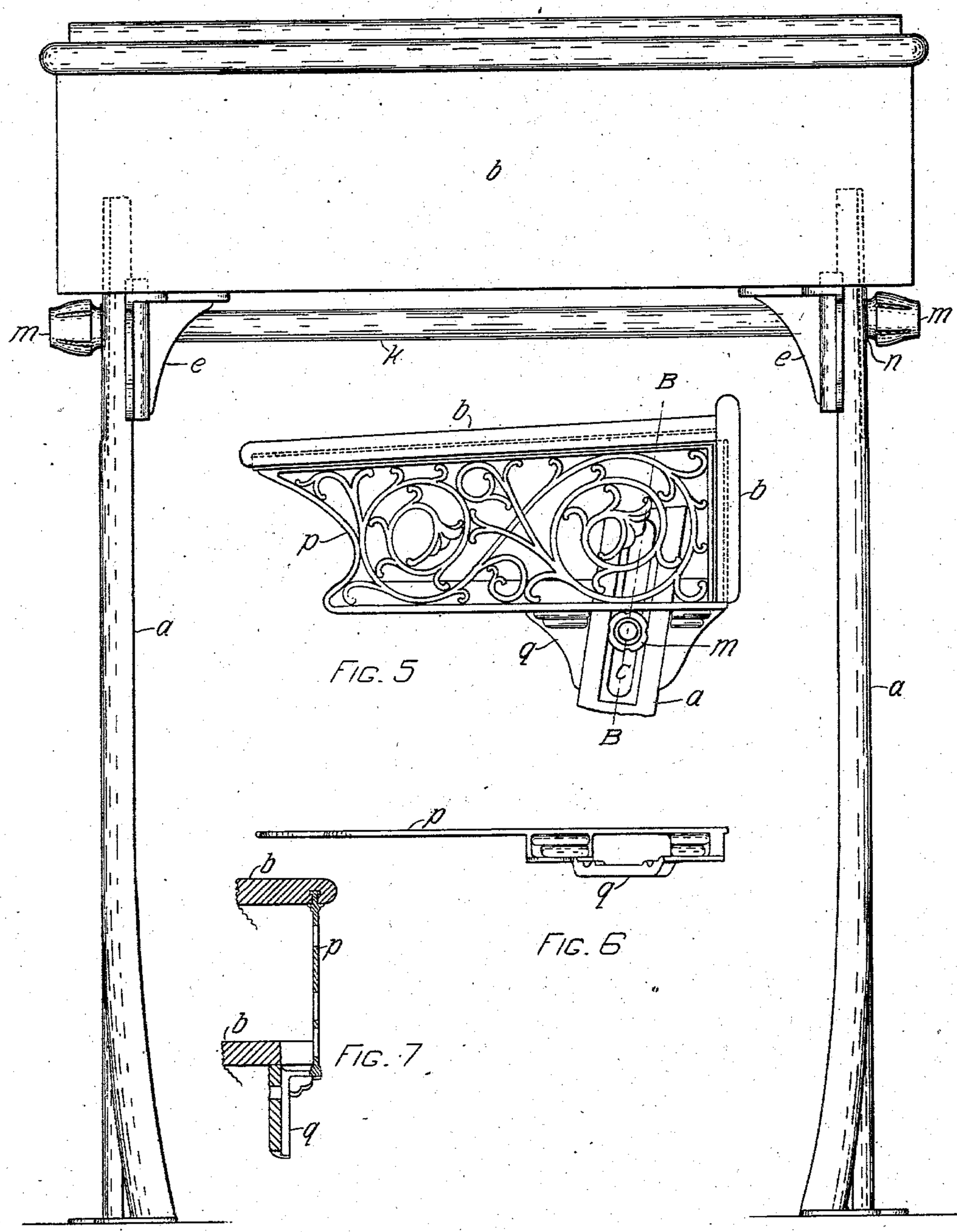

FIG. 5

FIG. 6

FIG. 7

WITNESSES

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NO MODEL. 2 SHEETS—SHEET 2.

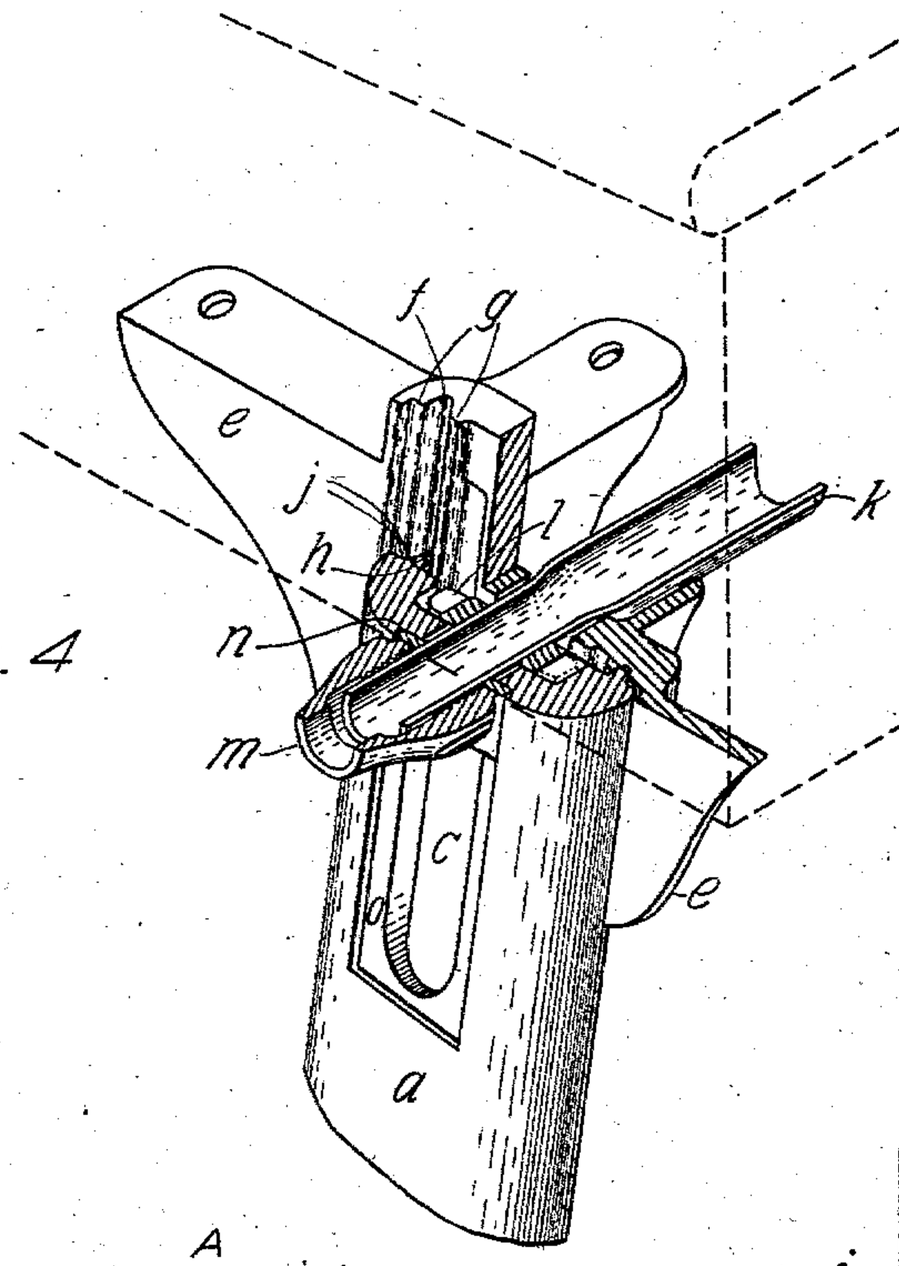

FIG. 4

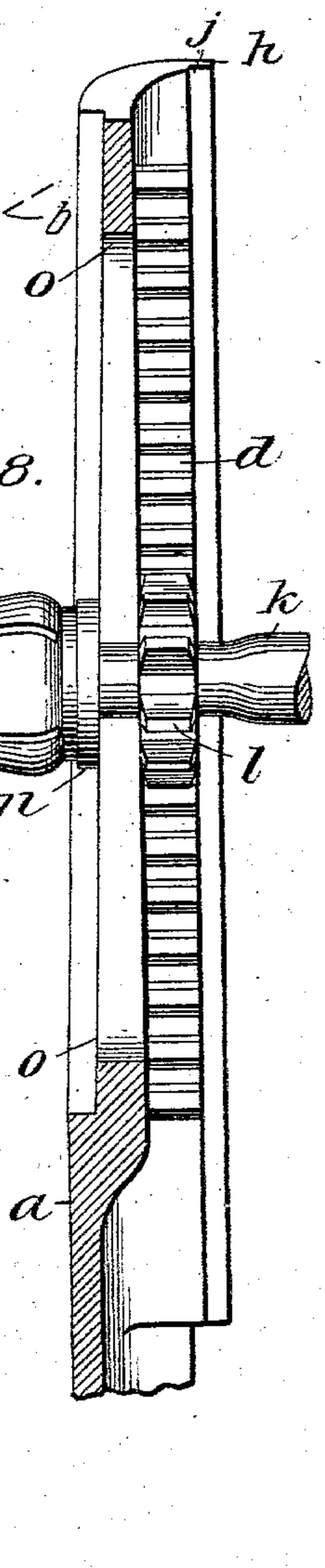

Fig. 8.

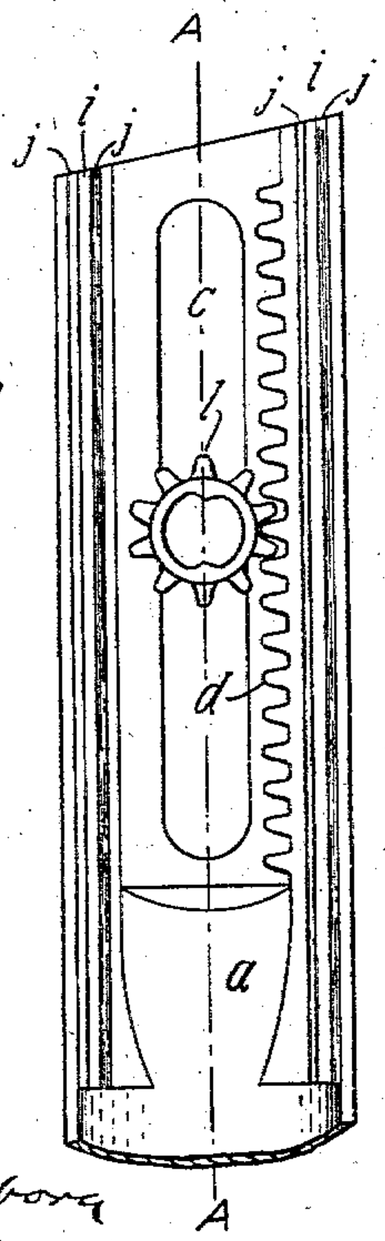

FIG. 2

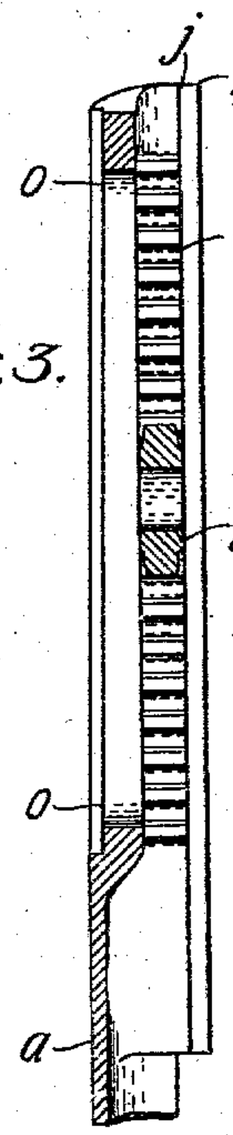

FIG. 3.

WITNESSES

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No. 730,623. Patented June 9, 1903.

UNITED STATES PATENT OFFICE.

RICHARD P. ELLIOTT, OF BOSTON, MASSACHUSETTS.

ADJUSTABLE FURNITURE.

SPECIFICATION forming part of Letters Patent No. 730,623, dated June 9, 1903.

Application filed December 15, 1900. Serial No. 39,960. (No model.)

To all whom it may concern:

Be it known that I, RICHARD P. ELLIOTT, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Improvement in Adjustable Furniture, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 is a front elevation showing my invention as embodied in a school-desk. Fig. 2 is a side elevation of the inner side of the upper end of the standard. Fig. 3 is a sectional view on line A A, Fig. 2. Fig. 4 is an isometric view of the adjusting mechanism, some of the parts being shown in sectional view and the edges of the desk being shown in dotted lines. Fig. 5 shows my invention as embodied in a school-desk having metal sides. Fig. 6 is a bottom plan view of the metal side and its attached brackets shown in Fig. 5, the standard being removed. Fig. 7 is a sectional view on line B B, Fig. 5, the standard being removed. Fig. 8 shows on an enlarged scale the inclined walls *o* of the slot *c* in the upper ends of the standard.

One feature of my invention consists in the means devised for the inclosing of the upper ends of the standards within the desk. This construction adds not only to the appearance of the desk, but to its strength. The standards are supported and braced perfectly, and rigidity, a feature so much desired in this class of furniture, is obtained.

Another feature of my invention resides in the combination of a pinion-and-rack vertical adjustment with a simultaneous horizontal adjustment. As the desk is adjusted vertically to provide for the greater height of the pupil, it is simultaneously adjusted horizontally to provide for the greater length of his arms.

A third feature of my invention lies in the combination of the pinion-and-rack vertically-adjusting mechanism with the inclined walls and coöperating nut, washer, and shaft. This feature locks the pinion in place, and thereby prevents the desk from falling down out of adjustment.

A fourth feature of my invention is the adjusting mechanism hereinafter described and claimed.

Other features of my invention are set forth in the description and claims which follow.

In the drawings which illustrate the principle of my invention and the best mode now known to me of applying that principle, *a a* are the standards, the upper ends of which are inclosed in the desk *b* and formed with the slot *c* and toothed rack *d*. (See Figs. 1, 2, and 4.) To the bottom of the desk *b* are secured the brackets *e e*, formed with guide-grooves *f* and guide-ribs *g*, which engage, respectively, the guide-ribs *h* and guide-grooves *j*, formed on the inside face of the standards *a a*. (See Figs. 4 and 2.) These guide ribs and grooves serve to give rigidity to the structure. In the brackets *e e* is journaled the hollow shaft *k*, upon which is mounted the pinion *l*, which engages the rack *d*. The ends of the shaft *k* project through the slot *c* and are screw-threaded exteriorly to receive the nuts *m m*. These ends of the hollow shaft *k* are shaped, as best shown in Fig. 2, to receive a wrench shaped to engage therein for the purpose of turning the shaft *k*. A washer *n* is interposed between the nut *m* and the inclined walls *o* of the slot *c*. These inclined walls *o*, in combination with the nut *m* and washer *n*, serve to lock automatically the pinion *l* in place, so as to prevent any impairment of the adjustment by jarring, shaking, &c., to which the desk may be subjected. Moreover, any downward pressure upon the desk serves only to tighten the clamping mechanism.

The operation of the adjusting mechanism is as follows: A wrench is inserted into the hollow shaft *k* and serves to hold up the desk while the nut *m* is loosened. After the nut *m* is loosened the wrench is turned, thereby rotating the pinion *l*, which is in engagement with the rack *d*. The upward movement of the pinion *l* and shaft *k* carries the brackets *e e* upward, and so raises the desk *b*. The slot *c* is inclined to the vertical, so that as the desk moves upward it also moves outward from the seat. After the desk is adjusted to the proper height the nut *m* is tightened, thereby, in combination with

the inclined walls *o*, securely locking the pinion and shaft in place.

In the modification shown in Figs. 5, 6, and 7 the sides *p* of the desk are made of metal, and the brackets *q* are integral with the sides *p*, as is best shown in the bottom plan view, Fig. 6.

By placing the upper ends of the standards inside the desk I attain many advantages, among which are: First, the supported member or desk itself supports the standards against stresses tending to separate them, and thereby confers the rigidity so greatly desired in adjustable furniture after its adjustment; second, the supported member overhangs the projecting ends of the shaft, and the standards and nuts are thereby free from any liability to interfere with free movement through the aisles between the desks; third, a greater number of similar desks can be set up in a given width; fourth, the structure permits the use of interior brackets, which serve to increase greatly the rigidity; fifth, a greater length of rack, and so a greater range of adjustment, is obtainable by the use of such brackets and inclosed standards, and, sixth, the unsightly ends of the standards and the adjusting-rack are kept from view and the appearance of the whole structure is greatly enhanced.

By forming the outer walls of the slot against which bears the clamping-washer with an incline running inwardly from bottom to top I provide a simple and efficient way of locking the shaft and pinion in position.

By journaling the shaft in brackets I obtain the means to increase the length of the adjusting-rack and also the rigidity of the structure. Again, when the desk is clamped in position the bottom of the desk, to which the brackets are secured, serves as an interposing or abutting member which takes up the stress, acting to force the standards together.

In structures where the standards are outside the desk a long bearing-surface cannot be obtained without destroying the appearance. By placing the standards inside the desk and using brackets I obtain great rigidity both by the longer bearing obtained and the bracing due to the bracket.

What I claim is—

1. An adjustable article of furniture comprising the standards formed with a rack; a member supported by said standards and formed with apertures to inclose and guide the upper ends of the standard; a shaft secured to said supported member; pinions mounted on said shaft and adapted to engage said racks; and means for clamping said supported member in its adjusted position.

2. An adjustable article of furniture comprising the standards formed with a rack; a member supported by said standards and formed with apertures for the passage thereof; a shaft rotatably secured to said supported member; pinions fast on said shaft and adapted to engage said racks; nuts mounted on said shaft; and washers interposed between said nuts and said standards.

3. An adjustable article of furniture comprising standards, the upper extremities of which are formed with racks and fitted in apertures formed in the bottom of the supported member; said supported member formed with apertures in its bottom; brackets secured to said supported member and slidably mounted on said standards; a shaft mounted in said brackets; pinions mounted on said shaft and adapted to engage said racks; and means for clamping said supported member in its adjusted position, the bottom of said supported member holding the standards apart and rigid against the pressure of said clamping means.

4. An adjustable article of furniture comprising standards the upper extremities of which are formed with racks and fitted in apertures formed in the bottom of the supported member; said supported member formed with apertures in its bottom; brackets secured to said supported member and slidably mounted on the inner side of said standards; a shaft journaled in said brackets; pinions fast upon said shaft and adapted to engage said racks; and clamping means mounted on the extremities of said shaft, the bottom of said supported member holding the standards apart and rigid against the pressure of said clamping means.

5. An adjustable article of furniture comprising the standards formed with a rack and with an inclined slot; a member supported by said standards and formed with apertures for the passage thereof and arranged to inclose their upper ends; a shaft secured to said supported member and projecting through said slots; pinions mounted on said shaft and adapted to engage said racks; and means for clamping said supported member in its adjusted position.

6. An adjustable article of furniture comprising a supported member formed with apertures in its bottom; standards the upper extremities of which fit in and pass through said apertures into said supported member; mechanism for raising and lowering said supported member on said standards; and means for clamping the upper ends of said standards against the bottom of said supported member.

7. An adjustable article of furniture comprising a supported member formed with apertures in its bottom; standards the upper extremities of which fit in and pass through said apertures into said supported members; brackets secured to said supported member and slidably mounted on the inside of said standards; mechanism for raising and lowering said supported member on said standards; and means for clamping the upper ends of said standards against the bottom of said supported member.

8. In an adjustable article of furniture, supporting-standards; a supported member pro-

vided with oppositely-disposed side frames; apertures in said side frames to inclose and guide the upper ends of said standards; and means for adjusting said standards in said frames.

9. In an adjustable article of furniture, oppositely-disposed side frames; an interposed member between said side frames; supporting-standards; brackets projecting inwardly from said side frames and provided with apertures to adjustably inclose the upper end of said supporting-standards; and means for adjusting and clamping said standards in said frames.

Dated at Boston, Massachusetts, this 14th day of December, A. D. 1900.

RICHARD P. ELLIOTT.

Witnesses:

JAMES HAMILTON,

H. M. KELSO.