E. G. WATKINS.

ADJUSTABLE FURNITURE.

APPLICATION FILED DEC. 28, 1907.

914,538. Patented Mar. 9, 1909.

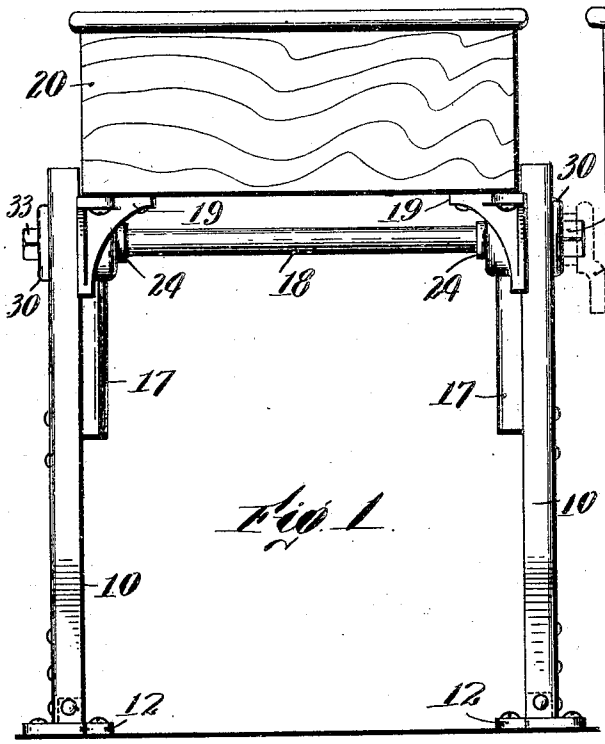


Fig. 1.

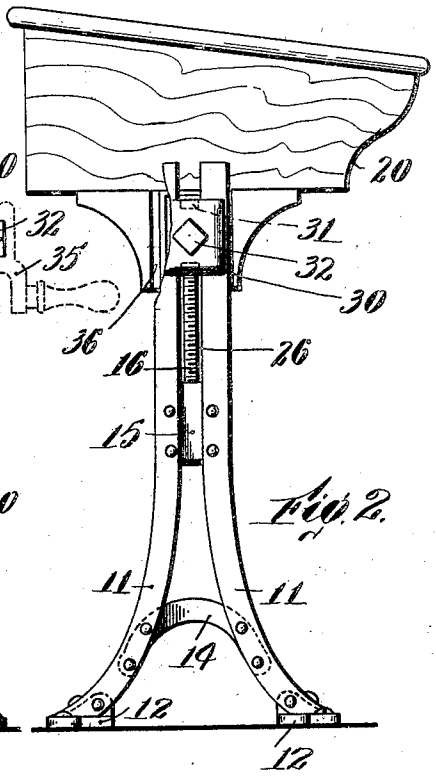


Fig. 2.

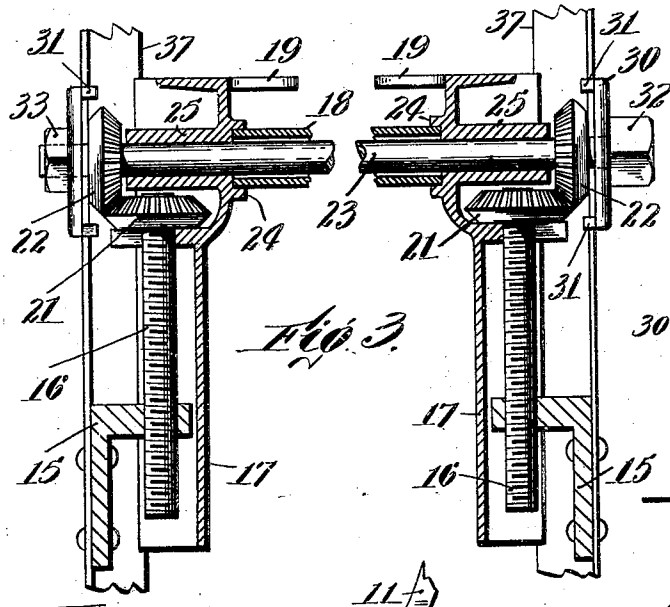


Fig. 3.

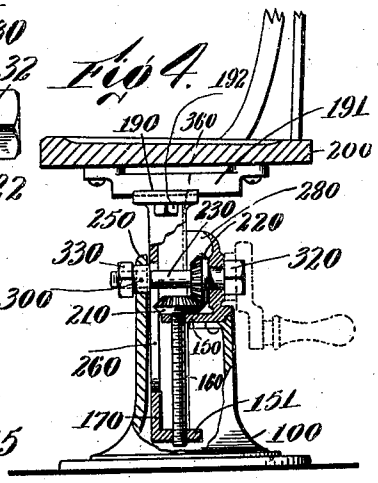


Fig. 4.

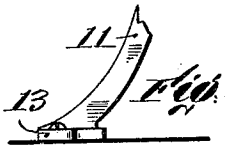


Fig. 5.

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UNITED STATES PATENT OFFICE.

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ADJUSTABLE FURNITURE.

No. 914,538. Specification of Letters Patent. Patented March 9, 1909.

Application filed December 28, 1907. Serial No. 408,369.

To all whom it may concern:

Be it known that I, EDWARD G. WATKINS, a citizen of the United States, residing at Gardner, in the county of Worcester and State of Massachusetts, have invented new and useful Adjustable Furniture, of which the following is a specification.

This invention relates to an article of furniture or the like, which, while capable of general use, is especially adapted for those structures which are provided with a top or upper part which occasionally has to be vertically adjusted and clamped in adjusted position.

Although I have illustrated the invention as applied to school furniture, it is to be understood that it is capable of application to other kinds of furniture, and in fact to any structure which requires the above mentioned operation.

The principal objects of the invention are to provide a construction in which the raising and lowering of the upper part of the article may be accomplished in a simple and convenient manner, and the same may be clamped against motion in a manner equally simple, preferably by means of a removable device which can be used both for raising and clamping, and which will leave the article in such shape that it cannot easily be tampered with; also to provide a simple and efficient construction for accomplishing these purposes; to provide a construction which can be applied both to a school desk and to the chair or stool thereof; to provide means whereby the application of the invention to a wide piece of furniture can be made in such a way that both ends can be lifted or lowered simultaneously and at the same rate of speed; to provide an inexpensive and strong construction of end pieces or legs for holding the parts in position; and especially to provide for effectually clamping the parts against motion.

Further objects and advantages of the invention will appear hereinafter.

Reference is to be had to the accompanying drawings which show preferred forms of the invention, and in which—

Figure 1 is a rear elevation of a desk showing one form of the invention applied thereto. Fig. 2 is an end view of the same. Fig. 3 is a central vertical longitudinal sectional view of part of the same. Fig. 4 is a side elevation of a school chair or stool with the invention applied thereto, parts appearing in section, and Fig. 5 is an end elevation of a part of a leg and foot showing a modification.

Referring first to Figs. 1, 2 and 3, it will be seen that the device is shown as supported by means of a pair of end pieces 10, each consisting of two legs 11 formed of steel, preferably of L-shaped cross-section, with their upper portions parallel and their lower parts flaring outwardly to afford a firm support. At the bottoms of the legs they are provided with cast metal feet 12 riveted to the legs, or they may be made with feet 13 integral with the legs as shown in Fig. 5. The legs are secured together by cross pieces 14 and 15 riveted to the webs of the legs. In this form of the invention each of the cross-pieces 15 is provided with a screw-threaded perforation, which constitutes a stationary nut for a lifting screw 16, and in this case the end pieces 10 together constitute a stationary frame for supporting a movable frame 17 which consists of two members separated from each other by a sleeve 18. These two members are provided with supports 19 on which the desk proper 20 rests, and to which it is screwed. In fact these members are connected together by this top piece and by the sleeve 18 so as to constitute a frame, as has been stated.

The screw or screws 16 are designed to run up and down through the stationary nuts, and raise and lower the frame 17. For this purpose the screws pass through perforations or slots in the frame 17, and on their upper ends are mounted bevel gears 21. These bevel gears mesh with bevel gears 22 which, in the presence instance, also may rest on the gears 21 if desired. These gears 22 are mounted on a shaft 23 which passes through both of the frames and through the sleeve 18. The sleeve 18 is held in the frame 17 in sockets 24, but may be loosely mounted if desired. The screws 16 are supported by the stationary nuts 15 and carry bevel gears 21 thereon. The latter mesh with the bevel gears 22 which are slidably mounted on the shaft 23 and rotate it. This shaft 23, therefore, will be raised and lowered as the screw is turned.

The frame 17 is provided with bearings 25 for said shaft, and consequently this frame is raised and lowered by the rotation of the shaft. The stationary frame is provided with slots 26, which, in the present instance,

is merely the space between the two legs 11, and through this slot or space passes the end of the shaft. The shaft also passes through a pair of guide blocks 30 which have projections or lugs 31 entering the slot or space 26 and guided by the legs. This serves to guide the shaft with respect to the stationary frame and hold the parts against lateral motion with respect to each other. They also serve another purpose, which will now be described.

On one end of the shaft it is provided with a head 32 and on the other end with a nut 33 adapted to be screwed up on the shaft. This head and nut bear on the outside surfaces of the stationary frame, but this is an indirect bearing, as they engage directly with the two guide blocks 30.

To operate the device a hand crank 35 having a socket adapted to fit both the head 32 and nut 33 which are preferably of the same size and shape, is placed on the nut to loosen it. Then it is removed from the nut and placed on the head. In this position it is used to turn the shaft and operate both of the screws simultaneously so as to raise and lower the desk or other piece of furniture to which it is applied in an obvious manner. When it is adjusted to the proper position, the hand-crank or wrench is applied to the nut 33 to tighten the same. This results in drawing the head 32 and the nut 33 together, applying pressure to the guide blocks 30 and clamping them to the stationary frame.

It will be seen that the inner edges 37 of the steel legs 11 constitute parallel guides working in grooves 36 in the frame 17. The clamping action on account of the resiliency of the legs also brings them into close contact with the grooves and clamps the parts together at this point.

The invention is not necessarily carried out in the particular form set forth above, and in fact when it is applied to a device having a single support, as for instance, a school chair or stool, it can be modified considerably, one instance of which is indicated in Fig. 4. Here a base or standard 100 constitutes the stationary frame, this being provided with a stationary projection 150 having a smooth perforation for a single lifting screw 160. The movable frame 170 is in this instance, provided with a nut 151 for said screw. This screw has a bevel gear 210 meshing with the bevel gear 220 on a shaft 230. This shaft in this instance, is mounted to turn in bearings 250 in the stationary frame instead of in the movable frame as before, and in this case the bevel gear on the shaft is not supported by the bevel gear on the screw, the latter being supported by the projection 150 on the stationary frame and not being reciprocated itself, but operating to reciprocate the movable frame as will be readily understood. The shaft is provided with a head 320 and a nut 330 as before, and is operated in substantially the same way, but in this case one of the bearings 250 is provided with a bushing 300 through which the shaft passes, and against which the nut is clamped to tighten the parts, this bushing bearing on the movable frame which has a slot 260 for receiving the shaft. The stationary frame also has a projecting guide piece 280 similar to the edges of the legs as described above, and operating in a groove 360 with which the movable frame is provided. On this movable frame is mounted a head 190 on which is mounted a frame 191 which is longitudinally adjustable on the head-bolts 192 securing these parts together. On the top of this is fixed the seat 200 of the chair or stool.

While I have illustrated and described two preferred embodiments of the invention, I am aware that many modifications may be made in both of them by persons skilled in the art without departing from the scope of the invention as expressed in the claims. Therefore, I do not wish to be limited to the particular forms shown, but

What I do claim is:—

1. The combination with two frames having perforations in alinement, the perforation of one of said frames being screw-threaded, of a screw entering said perforations, a shaft passing across said frames, means for transmitting motion from the shaft to the screw to turn it and to cause a relative motion between said frames, a head on said shaft bearing on the outside of one of said frames, a nut adapted to be screwed up on the other end of said shaft against the other side of the same frame to clamp the shaft thereto, said nut and head being of substantially the same size and shape, and a crank provided with a socket adapted to fit both the nut and head for turning the shaft and for clamping it.

2. The combination with two frames having perforations in alinement, one of said perforations being screw-threaded, of a screw entering said perforations, a shaft passing through one of said frames, means for transmitting motion from the shaft to the screw to turn the same and cause a relative motion between said frames, a head on said shaft bearing on the outside of the frame through which the shaft passes, a nut of the same shape and size as said head adapted to be screwed up on the other end of the shaft against the other side of the frame to clamp the shaft thereto and prevent rotation of the shaft, and a crank having a handle and a socket, said socket being adapted to fit both the head and the nut.

3. In an article of furniture, the combination with a stationary frame having vertical end slots, of a movable frame, bearings on said movable frame, a shaft passing through

said bearings and through said vertical slots, means controlled by said shaft for raising and lowering the movable frame, guide blocks mounted on the outside of the stationary frame and having projections adapted to slide in the slots thereof and having bearings for said shaft, means on one end of the shaft for clamping it against one of said guide blocks, and a sleeve loosely mounted on the shaft and engaging said movable frame to hold the ends thereof at a predetermined distance apart, whereby when the clamping means is tightened the movable frame will be clamped against the ends of said sleeve.

4. In an article of furniture, the combination with a stationary frame having vertical end slots, of a movable frame, bearings on said movable frame, a shaft passing through said bearings and through said vertical slots, guide blocks mounted on the outside of the stationary frame and having projections adapted to slide in the slots thereof and having bearings for said shaft, and means on one end of the shaft for clamping it against one of said guide blocks, said shaft having a head on the end opposite the clamping means, and on the outside of the guide block on that end of the frame, a gear on the shaft separated from said head, a second gear on the shaft near the other end thereof, the bearings on said movable frame being located adjacent to the inner ends of said gears, and means connected with the gears for raising and lowering the movable frame.

5. In an article of furniture, the combination of a stationary frame having vertical slots, guide blocks mounted to slide in said slots, a movable frame having bearings, a shaft supported in said bearings and bearing in said guide-blocks, means connected with said shaft for raising the movable frame, said movable frame consisting of two parts separated from each other and adapted to support the upper part of the article of furniture, a sleeve on said shaft and serving to separate said parts of the movable frame, and means on said shaft for drawing said guide-blocks together and clamping or locking the shaft against rotation.

6. In an article of furniture, the combination with a stationary frame consisting of a pair of side members, each having two legs formed of steel pieces L-shaped in cross section, each having a cross-piece fixed to said legs and assisting in securing them together, with a movable frame consisting of two members, each having a guiding groove for receiving the edges of said L-shaped steel pieces, and means for raising and lowering the movable frame along the edges of said steel pieces.

7. An article of furniture comprising a pair of legs, each formed of a piece of L-shaped sheet steel located parallel with each other throughout the main part of their length and secured together, both of said legs spreading apart at the bottom and a cast foot piece, comprising a flat base on which the L-shaped bottom of said legs rest, an upright part inside the leg to which the vertical side of the leg is fixed, and a slanting part inside the leg to which the curved portion of the leg is fixed.

In testimony whereof I have hereunto set my hand, in the presence of two subscribing witnesses.

EDWARD G. WATKINS.

Witnesses:
GEORGE D. GOODSPEED,
THATCHER B. DUNN.