

Oct. 15, 1929.

A. ENGERS

1,731,375

COMBINED ADJUSTABLE DESK AND SEAT

Filed Jan. 29, 1927

2 Sheets-Sheet 1

FIG: 1.

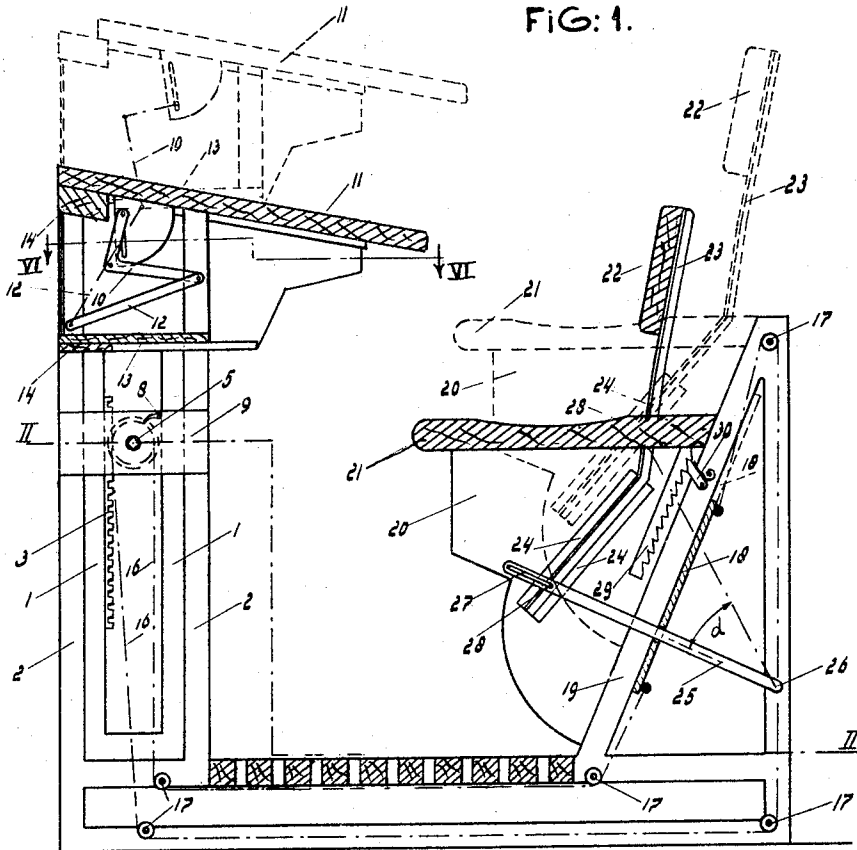


FIG: 2.

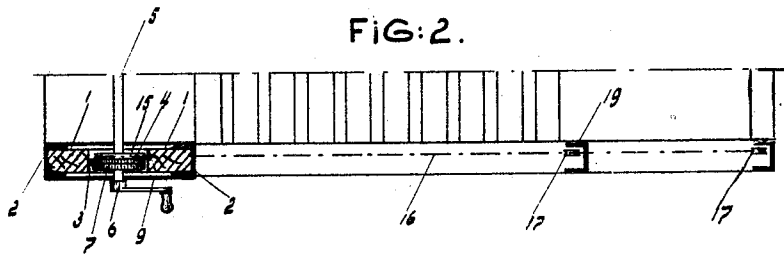


FIG: 3.

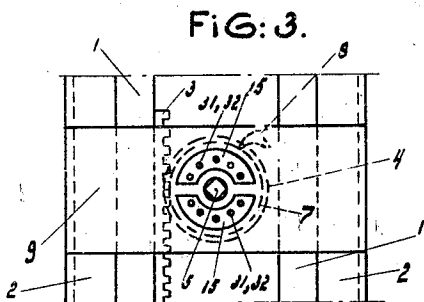
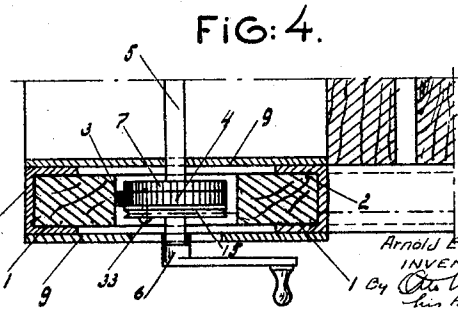


FIG: 4.



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INVENTOR
By *[Signature]*
his ATTY

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FIG:5

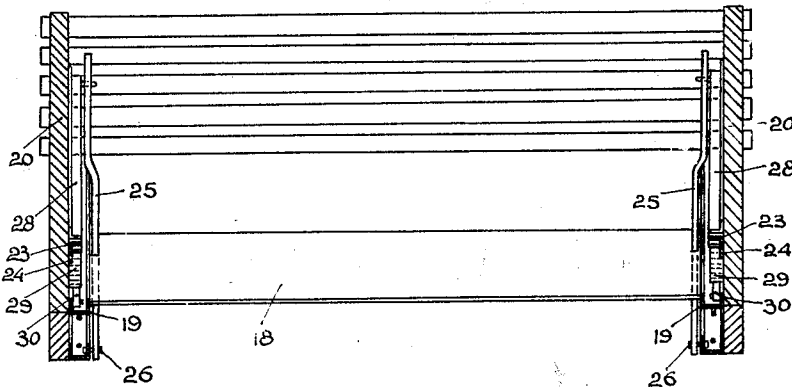
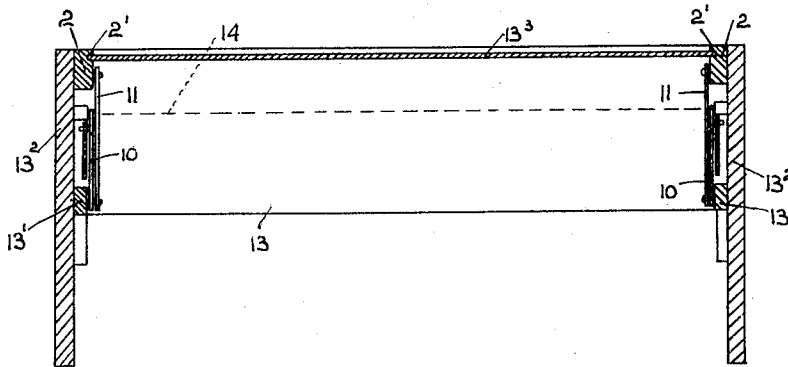


FIG:6



ARNOLD ENGERS
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By *Attorney*
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UNITED STATES PATENT OFFICE

ARNOLD ENGERS, OF ROTTERDAM, NETHERLANDS

COMBINED ADJUSTABLE DESK AND SEAT

Application filed January 29, 1927, Serial No. 164,391, and in the Netherlands January 30, 1926.

My invention has for its object an improved combined adjustable desk and seat of the type in which there is provided an operating mechanism, by means of which, when adjusting the desk, the seat is automatically raised or lowered along an inclined guideway.

Another object of the invention is a combined desk and seat of the type referred to which, as compared with known constructions, is distinguished by great simplicity and, therefore, comparatively low cost of manufacture.

According to my invention the construction is so designed that, when vertically adjusting the desk, a movement is imparted to a cable or the like driving member, the latter being so connected to the seat that the seat is adjusted simultaneously and in the same sense as the desk, that is to say, when raising the desk the height the usable width of the seat as well as the space between the seat and desk are simultaneously increased in the required proportions and vice-versa.

According to a preferred embodiment of the invention the desk is provided with a support arranged to slide in vertical guideways and carrying a rack engaging a rotatable, but otherwise stationary pinion adapted to be locked, said pinion being connected to a cable-pulley, sprocket wheel or the like, on which runs a cable rope or the like driving member, the ends of which are guided by idle rollers and are so connected to the seat that, when rotating the pinion so as to cause vertical adjustment of the desk, the seat is raised or lowered accordingly.

A further object of my invention is a combined adjustable desk and seat of the type referred to, in which the connection between the cable-pulley or the sprocket wheel and the pinion can be released and adjusted in such a manner that the desk can be re-adjusted independently of the seat, this being sometimes necessary in order to adapt the article to abnormally proportioned pupils or persons.

This can be obtained, according to the invention, by loosely mounting the cable-pulley or sprocket wheel on the axis of the pinion and providing said pulley or sprocket wheel with a series of holes placed in a cir-

cle concentrically with the axis of the pinion, said holes being adapted to co-operate, by means of a pin or the like, with a correspondingly arranged series of holes in the pinion.

The invention will now be described in detail with reference to the accompanying drawings, in which:—

Fig. 1 is a sectional elevation of the apparatus according to the invention,

Fig. 2 is a sectional plan on the line II—II of Fig. 1,

Figs. 3 and 4 are details of a modification on a somewhat larger scale, and

Figure 5 is a substantially transverse sectional view taken on a plane just below the seat. Figure 6 is a substantially transverse sectional view taken on lines VI—VI of Figure 1.

The uprights 1, supporting the desk, are vertically slidable in channel irons 2 constituting a part of the side frames of the apparatus. One of the uprights 1 carries a rack 3 engaging a pinion 4 keyed to the shaft 5. The shaft 5 extends lengthwise of the apparatus and at its other extremity carries an identical pinion engaging a second rack secured to one of the uprights of the desk in such a manner that, by rotating the shaft 5 by means of a crank 6 or the like, the desk may be raised or lowered without any risk of being jammed. Adjacent to each pinion 4 there is provided on the shaft 5 a ratchet wheel 7 co-operating with a pawl 8 pivotally mounted on a stationary plate 9 in which the corresponding end of the shaft 5 is journaled. By means of this mechanism the shaft 5 is prevented from rotating in an opposite direction under the weight of the desk.

Against the inner face of each side member of the desk there is provided a bell-crank lever 10, one arm of which is pivotally and slidably connected to the sliding top 11 of the desk by means of a pin and slot connection, whilst the other arm of the bell-crank lever 10 is connected, by means of a pivotable link 12, to a fixed point, all in such a manner that, when vertically raising or lowering the desk by means of the racks 3 and the pinions 4, the bell-crank levers 10 are displaced and the top 11 is slid outwards or inwards. The

plate 13 is connected at its front by two uprights 13', to the top 11 of the desk and slides on the plate 14, while being guided by the side members 13² of the desk. At the rear, the plate 13 is connected with the top 11 by a sliding panel 13³ running in grooves 2' of the stationary uprights 2.

In the case of the embodiment shown in Figures 1 and 2, adjacent each pinion 4 is provided on the shaft 5 a cable-pulley 15 encircled by a cable or rope 16. The cables 16 are guided by idle rollers 17 and by their ends are connected respectively at the upper and lower ends of a plate 18 sliding along the back of the inclined guideways 19 and which is connected to the side frames 20 carrying the seat 21. The guideways 19 in this case are also channel irons constituting a part of the stationary side frames of the apparatus. The back 22 of the seat is supported by arms 23 the lower ends of which are bent inwardly and downwardly and are slidable in stationary inclined guideways 24 carried by the frames 20. Each arm 23 is moreover acted upon by a lever 25, one end of which is pivotable about a fixed point 26, whilst the other end engages a pin 28 on the corresponding arm 23 by means of a slot 27. The lever 25 is moreover slidably connected to a portion of the seat, e. g. by passing said lever through an opening in the plate 18.

In conclusion the side frames 20 of the seat may be provided with ratchet bars 29 cooperating with a spring-controlled pawl 30 for supporting the seat. The pawls 30 are preferably mounted on a common shaft in such a manner that they may be put out of action simultaneously for releasing the seat when the same has to be lowered.

When by rotating the shaft 5 the desk is raised, e. g. to the position shown in dotted lines, such movement will be transmitted, by means of the cables 16, to the plate 18 in such a manner that the latter is moved upwardly and backwardly along the inclined guideways 18, so that the seat 21 is raised to the position indicated. The levers 25 are swung by the plate 18 through an angle in such a manner that the arms 23 of the back of the seat are displaced backwardly and upwardly in the inclined guideways 24 with respect to the usable seat, so that not only is the seat portion widened, but at the same time the back of the seat is correspondingly raised as is clearly shown in Fig. 1. By rotating the shaft 5 all dimensions of the apparatus are adjusted in exact proportions.

Figs. 3 and 4 show details of a modified form of the operating gear, the latter being so designed that, if necessary, the desk may be re-adjusted independently of the seat.

According to this modification the cable-pulley 15, which in this case is arranged near the outer end of the shaft 5, is free to rotate

on said shaft 5, and is provided with a series of holes 31 placed in a circle concentrically surrounding the shaft 5. These holes 31 may be brought in alignment with a correspondingly arranged series of holes in the pinion 4. The pulley 15 is normally secured to the pinion 4 by means of a pin 33 passing through a hole in the pulley and a correspondingly disposed hole in the pinion, so that, when rotating the shaft 5 by means of the crank 6, the pulley is carried on by the pinion and the seat is adjusted accordingly. The front plate 9 is provided with openings to clear the holes in the pulley and enable the pin to be inserted therein.

In other respects the construction of the apparatus is identical with that of the embodiment shown in Figs. 1 and 2. When the pin 33 is inserted the pulley 15 is connected to the pinion, so that by operating the handle or crank 6, the desk and the seat are adjusted simultaneously.

In case for some reason or other it is necessary to re-adjust the desk with respect to the seat, the pin 33 is withdrawn so that the shaft 5 can be rotated without rotating the pulley. As soon as the desired position is obtained, the pin 33 is again inserted in any two holes 31, 32 which are in alignment. It is clear that, if desired, more than one pin may be provided or that the pin or pins may be permanently withdrawn and only inserted when it is necessary to adjust the apparatus.

It is further to be understood that all parts of the mechanism are so encased that they are protected from unintended operation.

What I claim is:

1. In combination, a frame and a desk supported for upright adjustment in said frame, a rack for the desk, a pinion in mesh with the rack and mounted in the frame, a pulley to turn with said pinion, inclined guideways forming part of the frame, a seat supported in said guideways, and a cable disposed over said pulley and its ends connected to the seat, whereby rotary movement of the pinion to elevate the desk imparts simultaneous movement to the seat through the said cable connection.

2. A combination desk and seat as claimed in claim 1, in which the inclined guideways are provided with a detent and the seat is provided with a tooth extension to be engaged by the detent.

3. In combination, a substantially U-shaped frame, a pinion and pulley mounted in one arm of the frame, a desk mounted for upright adjustment in the same arm and having a rack to engage the said pinion, inclined guideways forming part of the other arm of the frame, a seat supported for adjustment on said guideways, pulleys at the angles of the frame and at the free end of the arm supporting the seat, and a flexible cable forming

a continuous element with the seat and disposed about all of said pulleys, whereby simultaneous adjustment of the desk and seat will take place upon rotary movement being imparted to the pinion and pulley.

5 4. A combination desk and seat, as claimed in claim 1, including means for detachably connecting the pulley to the pinion, whereby adjustments of the seat and desk may be made
10 independently.

5. In combination, a frame and a desk supported for upright adjustment in said frame, means for elevating said desk, a wheel operated by said desk-elevating means, inclined
15 guideways forming part of the frame, a seat supported in said guideways, and a flexible connecting-member disposed over said wheel and having its ends connected to the seat, whereby movement of the elevating means
20 to raise the desk imparts simultaneous movement to the seat through the said flexible connection.

In testimony whereof I affix my signature.
ARNOLD ENGERS.

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