

J. MICHAELS.
DESK.
APPLICATION FILED DEC. 27, 1920.

1,398,237.

Patented Nov. 29, 1921.
7 SHEETS—SHEET 1.

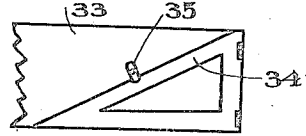
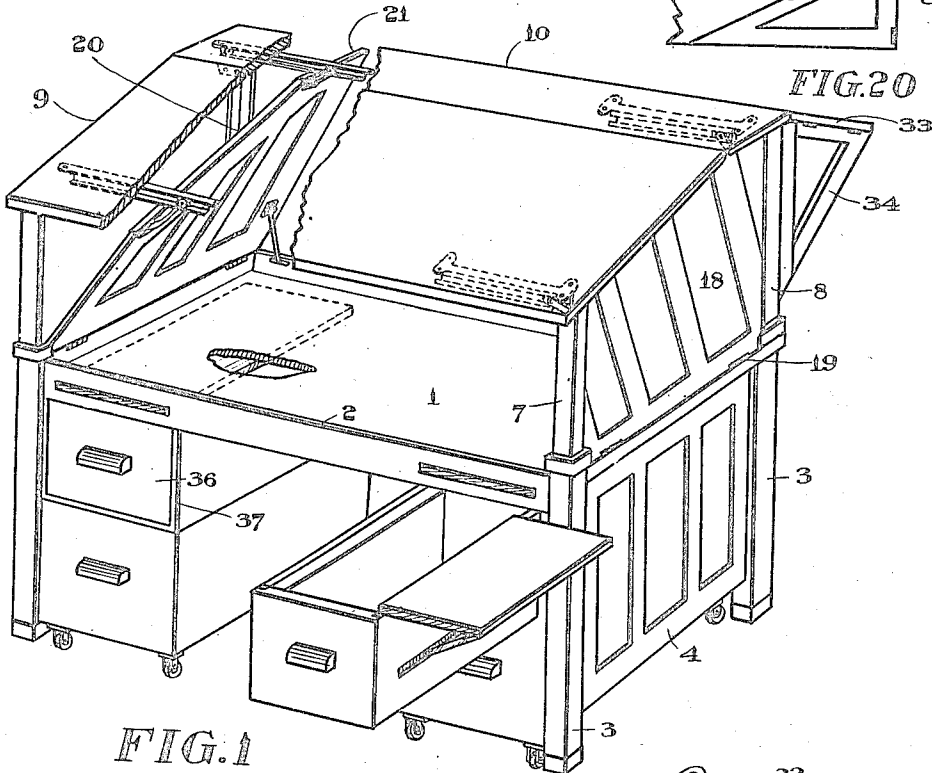


FIG. 20

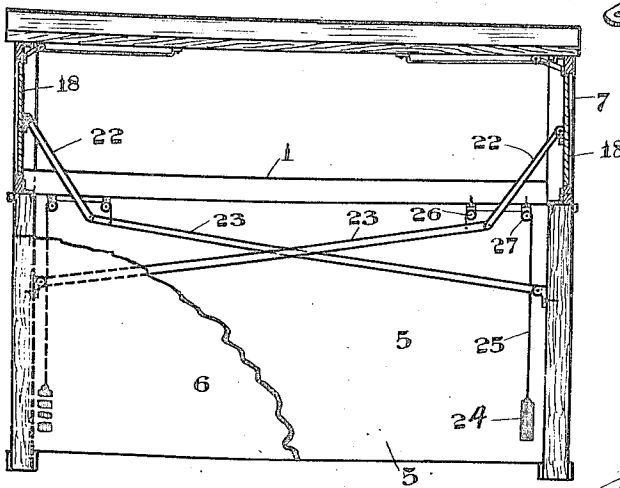


FIG. 2

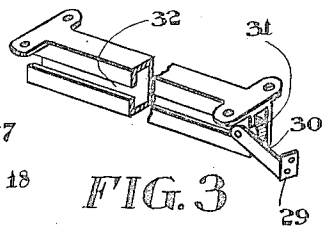


FIG. 3

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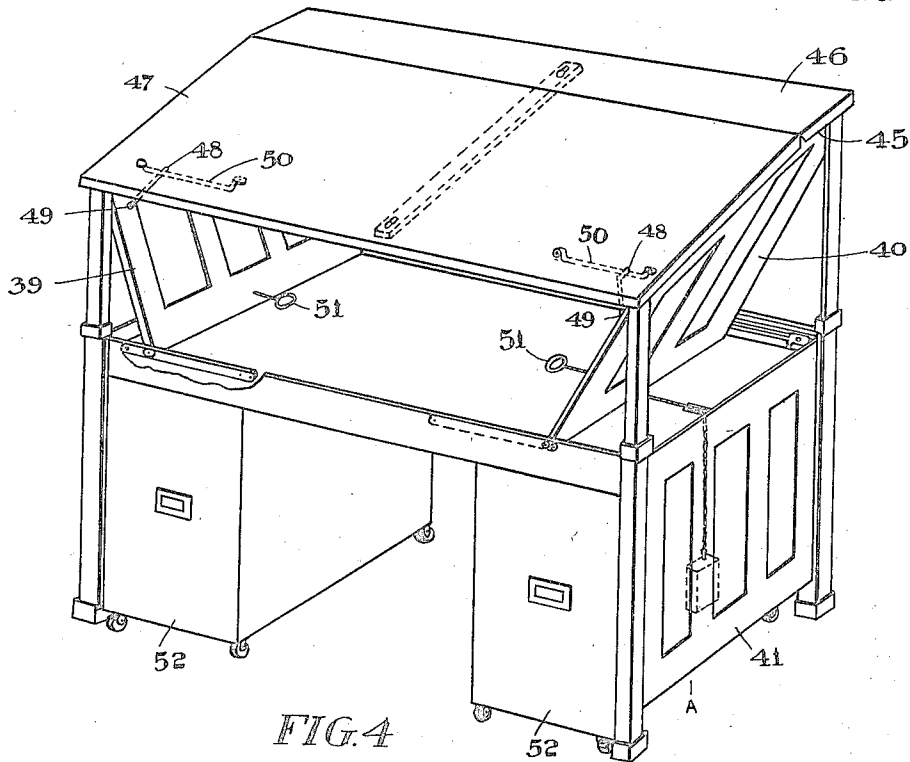


FIG. 4

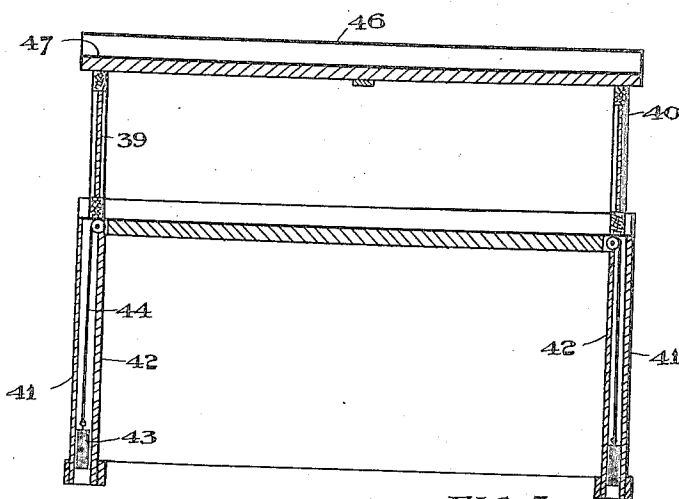


FIG. 5

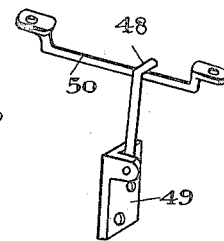


FIG. 6

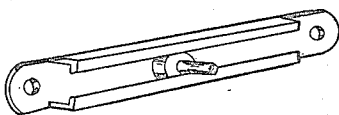


FIG. 7

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7 SHEETS—SHEET 3.

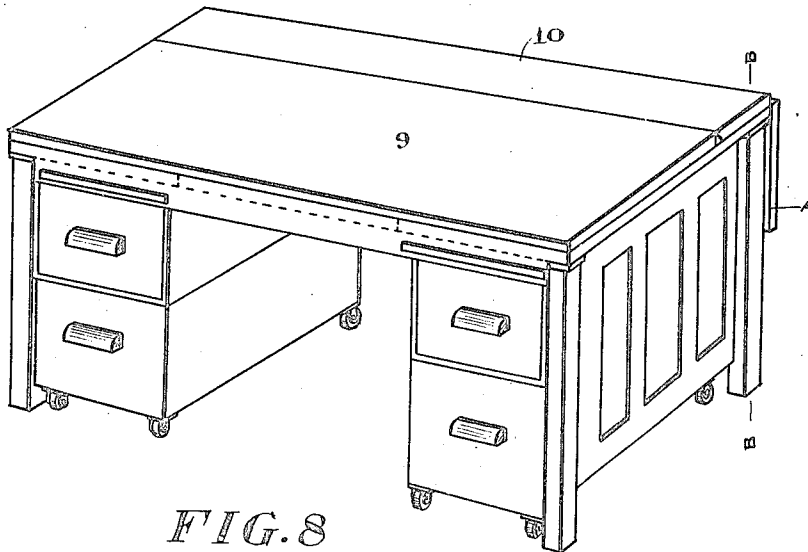


FIG. 8

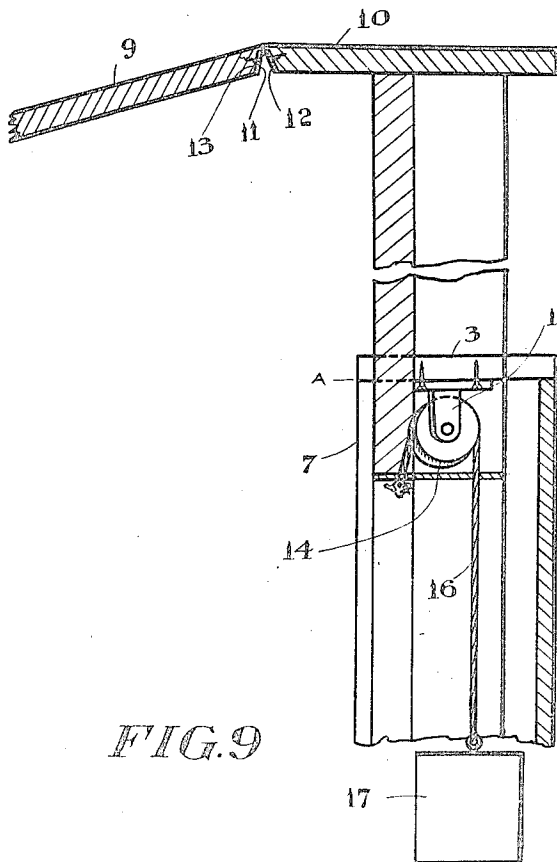


FIG. 9

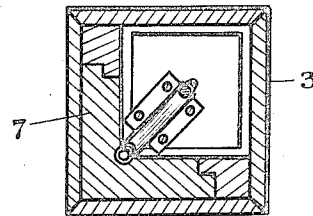


FIG. 10

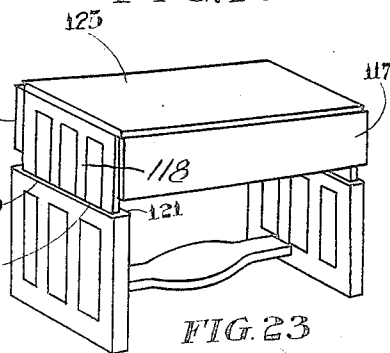


FIG. 23

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7 SHEETS—SHEET 4.

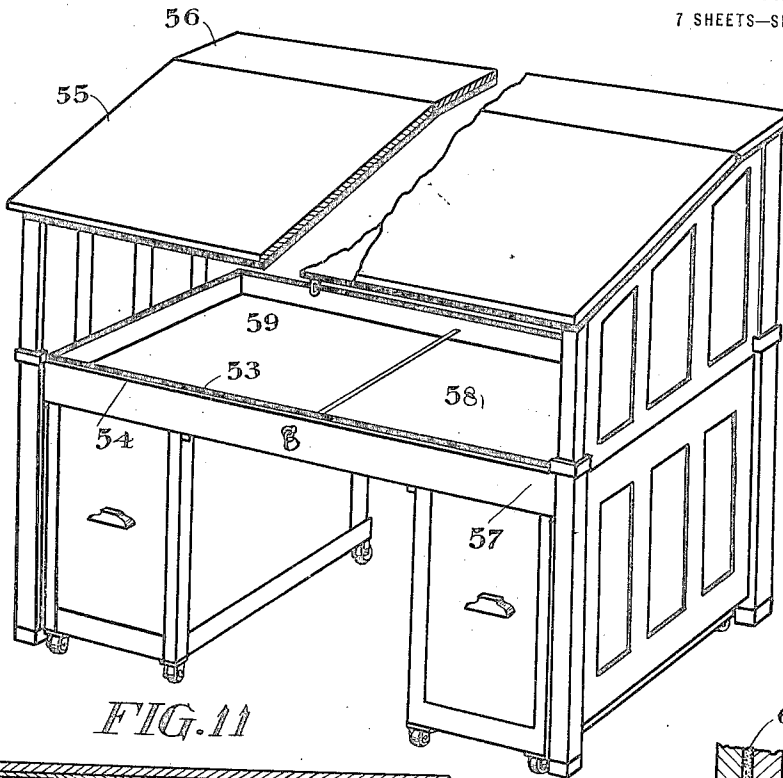


FIG. 11

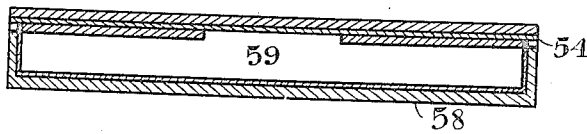


FIG. 13

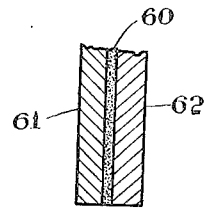


FIG. 21

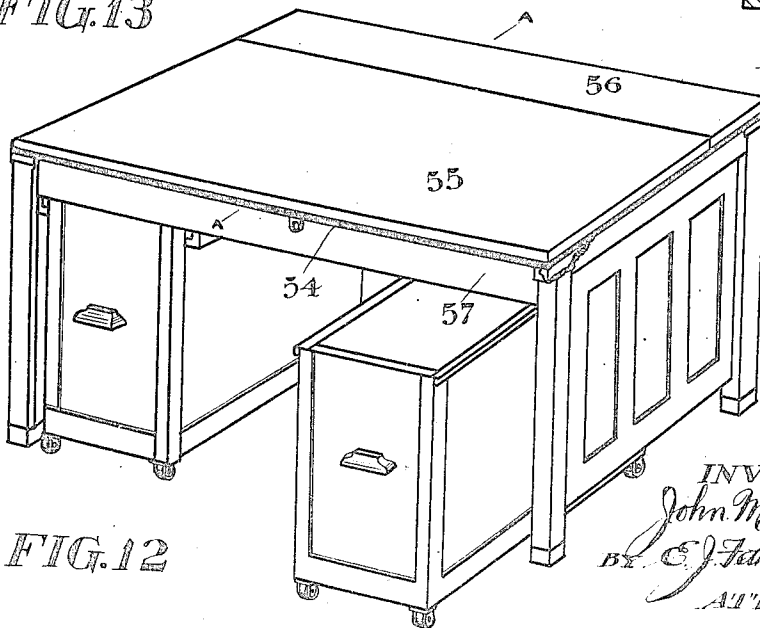


FIG. 12

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APPLICATION FILED DEC. 27, 1920.

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7 SHEETS—SHEET 5.

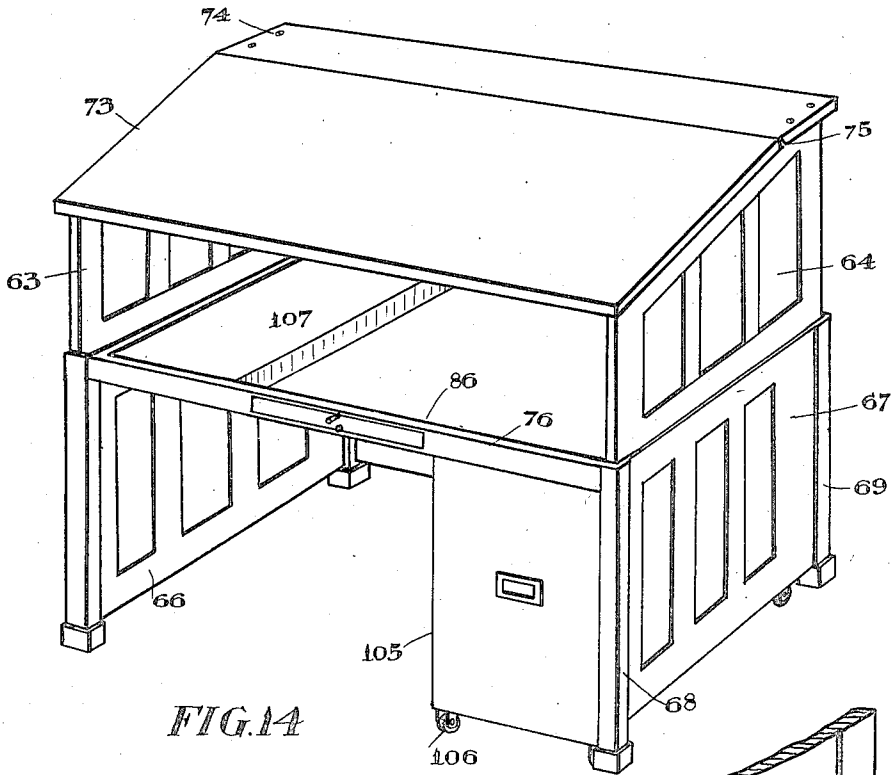


FIG. 14

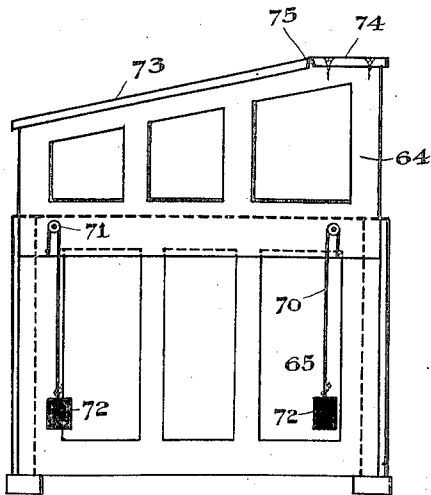


FIG. 15

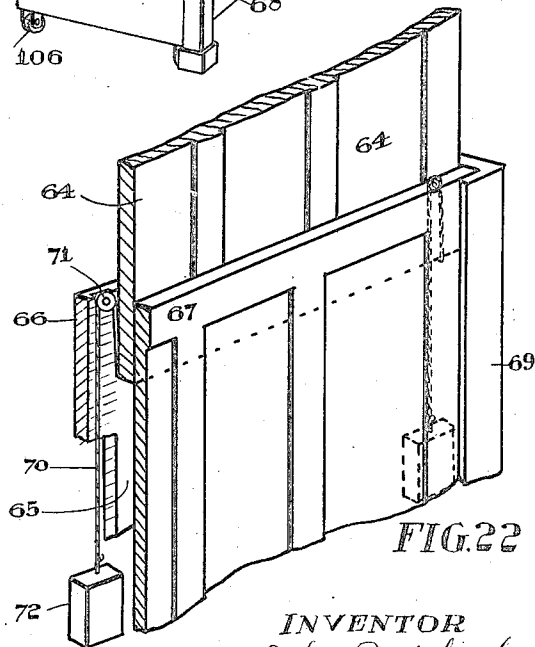


FIG. 22

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7 SHEETS—SHEET 6.

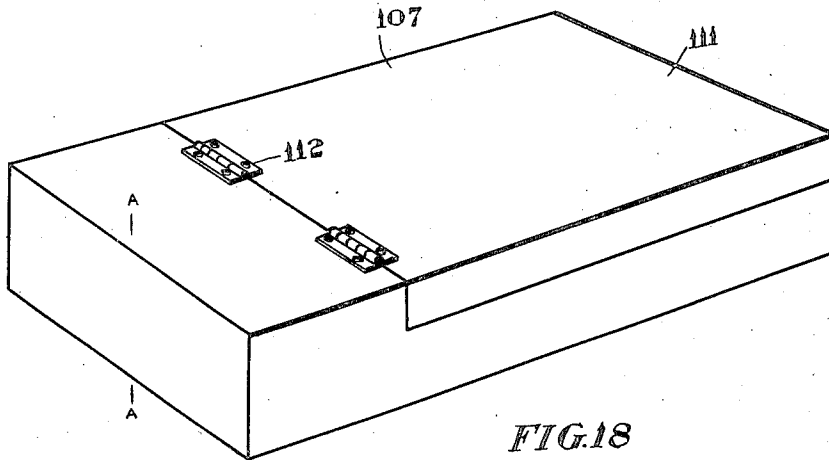


FIG. 18

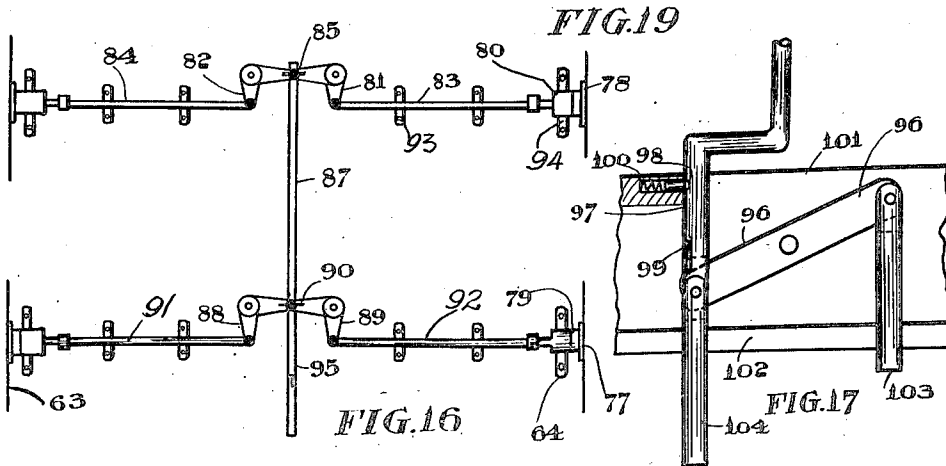
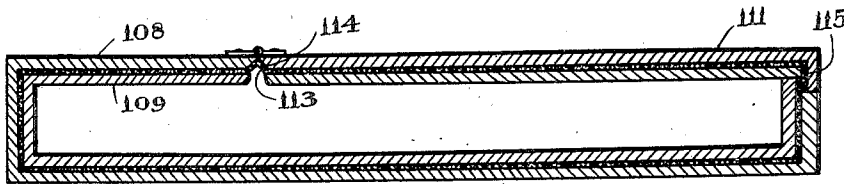


FIG. 16

FIG. 17

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7 SHEETS—SHEET 7.

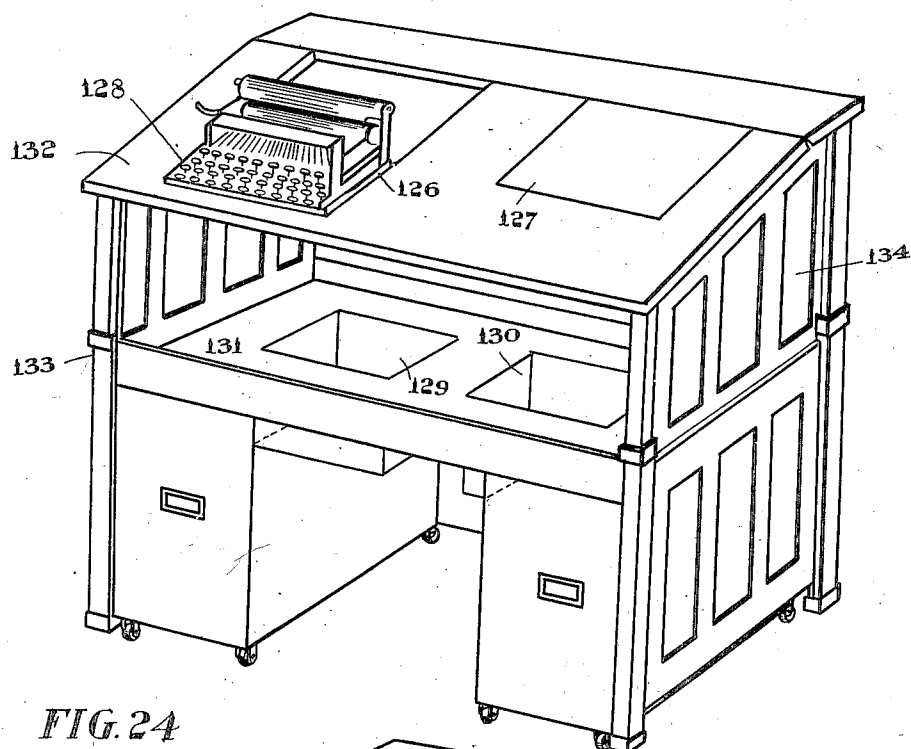


FIG. 24

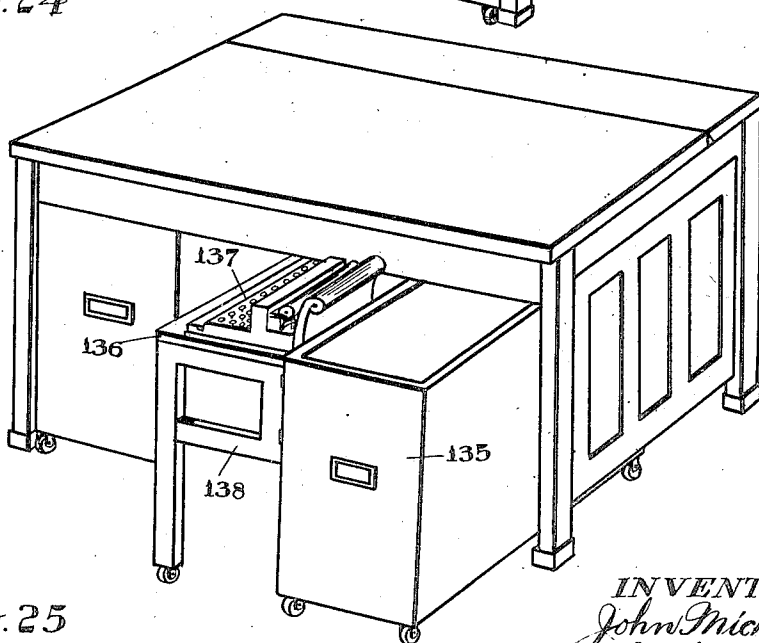


FIG. 25

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UNITED STATES PATENT OFFICE.

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DESK.

1,398,237.

Specification of Letters Patent.

Patented Nov. 29, 1921.

Application filed December 27, 1920. Serial No. 433,405.

To all whom it may concern:

Be it known that I, JOHN MICHAELS, a subject of the King of Great Britain, and residing at 322 Roslyn avenue, in the city of Westmount, in the District of Montreal, in the Province of Quebec, in the Dominion of Canada, have invented a new and useful Desk, of which the following is the specification.

The invention relates to desks as described in the present specification and illustrated in the accompanying drawings that form part of the same.

The invention consists essentially in the novel features of construction in which it will be seen that in one position the desk is low and has a flat table top, while in the other position it is high and has a sloping top and flat ledge similar to what are usually called "accounting desks," these and the other elements of the construction being more fully explained with reference to the drawings hereinafter.

The objects of the invention are primarily to economize in office space where both low and high desks are desirable, and at the same time afford comfort and rest to a busy office man by permitting a change in position without transferring the books and papers to another desk. A further object of this invention is to provide a safe place for the temporary concealment of documents and other papers during the absence of the officer to whom the desk belongs, and also to reduce the equipment charges in large establishments. A further object is to raise and lower the top with equal facility, either action requiring scarcely any muscular effort, and to do this by simple and cheap mechanism, easy to construct, and so free from complications that it will operate continuously without special attention. Generally, the object of the invention is to provide a desk by means of which increased efficiency will be assured, particularly in large offices where many people are employed, though it will prove equally service-

able in smaller offices, and will afford every facility toward the better conduct of office routine.

In the drawings, Figure 1 is a perspective view of the desk partly broken away at the top thereof to disclose the inside of an end panel.

Fig. 2 is a longitudinal and vertical sectional view of the desk showing particularly the panel weights.

Fig. 3 is a perspective detail of one of the tracks for securing the panels to the desk top.

Fig. 4 is a perspective view of the desk showing the panels operating in a slightly different fashion; that is to say, they are permanently hinged to the top, and they slide inwardly at the bottom instead of being hinged at the bottom and sliding inwardly at the top as illustrated in Fig. 1.

Fig. 5 is a longitudinal vertical section showing the operating weights for the panels.

Fig. 6 is a perspective detail of the hook fastening from the panel to the front portion of the desk top.

Fig. 7 is a perspective detail of the track for the guide lugs from the panels.

Fig. 8 is a perspective detail of the complete desk closed in either of its forms.

Fig. 9 is an enlarged sectional detail of the leg-lifting mechanism.

Fig. 10 is a cross-sectional view on the line A—A in Fig. 9.

Fig. 11 is a perspective view of the desk showing some additional features pertaining particularly to fire-proof protection.

Fig. 12 is the desk closed as illustrated in Fig. 11.

Fig. 13 is a cross-sectional view of the desk illustrated in Figs. 11 and 12 in the closed position on the line A—A in Fig. 12.

Fig. 14 is a perspective view of the desk showing another arrangement of the supporting panels in which the said panels become an elevating element.

Fig. 15 is an end elevation of the desk

having outside lower permanent panel removed to disclose the slideway for the upper elevating panel.

Fig. 16 is a plan view of the locking mechanism.

Fig. 17 is a detail of the operating push rods.

Fig. 18 is a perspective view of the fireproof box within the desk.

Fig. 19 is a longitudinal section of the fireproof box illustrated in Fig. 18.

Fig. 20 is a fragmentary view showing the under side of the folding shelf applicable to any form of the invention in making a vis-a-vis desk.

Fig. 21 is a fragmentary detail of the desk wall or top or any of the outside parts of the desk in which it will be seen that the boarding is formed of layers, the middle one of which is of fireproofing material.

Fig. 22 is a fragmentary sectional perspective view showing the operating parts of this invention with the end panels as lifting elements.

Fig. 23 is a perspective view of an office table having a plurality of folding leaves elevatable.

Fig. 24 is a perspective view of the elevatable desk as applied to a typewriter desk in an elevated position.

Fig. 25 is a perspective view of the desk, showing the accompanying box or drawer removable frame carrying a typewriting machine.

Like numerals of reference indicate corresponding parts in the various groups of figures relating to the different forms of the invention respectively.

Referring to the drawings, in Figs. 1, 2, 3, and 20, together with Figs. 8, 9, and 10, the body of the desk is formed of the under table board 1 surrounded by a frame 2, supported on the legs 3 at the four corners with the end permanent lower panels 4, and the back panels 5 and 6, forming a weight and rod chamber. The frame 2 surrounds a recess of which the undertable 1 is a bed, and the legs 3 are hollow to receive the telescopic legs 7 at the front end of the desk, and these legs 7 and 8 support the desk top boards 9 and 10, the boards 9 and 10 meeting on the top surface and beveled at 11 and 12 respectively to form a V-shaped recess in which the hinges 13 effectively join the said boards together.

The pulleys 14 are journaled in the hangers 15, rigidly secured at the upper ends of the legs 3, and the cables 16, secured to the lower end of the legs 7 and 8, pass over the pulleys 14 and at their ends are weighted by the weights 17, suspended within the legs 3. These weights compensate for the weight of the top boards 9 and 10 so that there is really little or no exertion about bringing the said top boards to their upper position.

The end panels 18, forming a support for the top boards 9 and 10, are secured to the ends of the frames 2 by the hinges 19, and on the top sides are shaped with the slope 20 and straight portion 21, so that when the panels 18 are in their upper position they shape the top boards to the correct slope and ledge of an accounting desk.

The end panels 18 are operated by the rods 22 and 23 and the weights 24. The rods 22 are pivotally secured to the panels 18, one to each panel, and extend through slots in the under table 1 into the recess between the back panels 5 and 6, and are there pivotally joined to the longer rods 23, which extend over to opposite sides of the desk and are pivotally secured.

The cables 25 are connected to the long rods 23, and pass over pulleys 26 and 27, supported from the under side of the under table 1 and carry at their lower ends the weights 28, which weights are sufficiently heavy to carry the panels to their vertical position after the weight of the desk boards has been removed therefrom.

The anchoring guides 29 are secured to the insides of the panels 18, one at each end of said panels, and are formed of the strap 30 and roller 31, the latter traveling in the tracks 32, and secured to the undersides of the desk top boards 9 and 10.

The rear shelf 33 is hinged to the top board 10 and folds downwardly, and therefore is elevated and lowered with said top. The gate brackets 34 are hinged to the underside of the shelf 33 and in the folded position of the shelf are held by the buttons 35; this shelf in the elevated position being lifted and the gates 34 swung downwardly to support the shelf against the legs 8, thereby providing, in an accounting desk also a checking desk. Of course, the shelf 33 may be extended in the lowered position of the desk also, though that is not at all a likely event.

The drawers 36 are here shown as mounted in the frames 37, supported on casters 38 instead of fixed to the desk, as customary, thereby making it possible to have any form of cabinet arrangement for filing or other partitioned receptacle in place of the ordinary drawers. In this form of the desk, the operation of elevating is accomplished by simply raising the top with the hands, for the compensating weights make this a very simple and easy task. When the desk top is being raised to its upper position, the panels immediately follow until they reach their vertical positions, which is under the said top boards, and which they shape for an accounting desk with the slope and the straight ledge as customary in that class of desks.

In Figs. 4, 5, 6, and 7, together with Figs. 8, 9, and 10, the different construc-

tion is in the arrangement of the folding panels 39 and 40, and the end fixed lower panels 41 and 42, the latter forming recesses for the weight 43 and cable 44, said cable being attached to the lower end of the panels 39 and 40, the top of said panels on the straight portion 45, being hinged to the ledge board 46 of the desk top, the sloping writing board 47 of the top being anchored to the panels 39 and 40 by the hook 48 pivotally secured to an outstanding lug from the plate 49, each of said panels 39 and 40 having a plate 49 rigidly secured thereto, the hooks 48 from the plates engaging the tracks 50 secured to the under side of the writing board 47.

The handles 51 are secured to the bottom of the panels 39 and 40 on the inner sides. By means of these handles the weights are lifted until the panels are drawn inwardly toward one another at their lower ends.

The cupboards 52 are shown in place of the drawers 36, but it is practically the same construction, as they are mounted on casters and may be made on the inside in any way to meet the wants of the customer.

In the operation of this form of the invention, the handles 51 are drawn toward one another in closing the desk, that is to say, in lowering the top boards. In elevating the desk the top boards are simply lifted, and the panels 39 and 40 draw under the said top boards, and in position are in every way equivalent to the panels 18.

In Figs. 11, 12, 13, and 21, together with Figs. 9 and 10, a difference in the construction is shown, not so much in the operating mechanism, though it is still a combined high and low desk illustrated, but the feature of this is the fireproofing 53 secured with the boarding 54. The boarding forms a facing on the desk top boards 55 and 56, and the frame 57, also the under table 58, thereby making a fireproof recess 59 in which papers and other documents may be kept.

In Fig. 21 the fireproofing layer 60 is shown between boards 61 and 62, and by this means a much cheaper construction is secured than in the other figures, for the layer 60 may be made simply of asbestos paper, while in the lining 53 the material really should be an asbestos composition or asbestos and metal.

In Figs. 14, 15, 16, 17, and 22 a very efficient form of this invention is illustrated in which the upper end panels 63 and 64 become lifting elements, sliding upwardly and downwardly in the weight recesses 65 formed between the inner and outer lower panels 66 and 67 at each end of the desk, the said upper panels 63 and 64 extending downwardly into said recess even in their upper position within vertical grooves in the front legs 68 and back legs 69,

The cables 70 are secured to the lower ends of the upper panels 63 and 64 and pass over the pulleys 71 journaled in brackets secured to the wall of the recess 65, and these cables at their ends carry the weights 72, which are heavy enough to compensate for the weights of the upper panels 63 and 64, and the desk top boards 73 and 74, the top board 74 being the flat ledge board in the elevated position of the desk, and the board 73 being the sloping writing board.

The panels 63 and 64 are shaped correspondingly to support these boards, and the ledge board 74 is fixedly secured to the straight portion of the upper edge face of said panels, while the writing board 73 is hinged to the ledge board 74 with the V-shaped recess 75 therebetween, as explained hereinbefore; otherwise, the writing board 73 is free to straighten out and be perfectly flush with the ledge board 75 on the lowering of the panels, as the said ledge board comes in contact with the desk frame 76, which also supports the ledge 74; in fact, in the lower position they make one flat top with a very close joint, so that the division is not noticeable. As the upper panels 63 and 64 are lifting elements, naturally they must be held to their upper position, and to accomplish this there are many devices which may be used, but the preferable form is that shown in detail in Figs. 16 and 17.

The racks 77 at the front inner side, and 78 at the rear inner side are secured to the panels 63 and 64, and have preferably tapered teeth, though teeth may be used in any suitable form. The racks 77 are engaged by the dogs 79, and the racks 78 are engaged by the dogs 80. The rear dogs 80 are connected to the crank levers 81 and 82 by the connecting rods 83 and 84, and the crank levers 81 and 82 are connected in a slotted pivotal joint 85, while the levers themselves at their angles are pivotally secured to the under side of the under table 86.

The slotted pivotal joint 85 is connected by the rod 87 to the crank levers 88 and 89 at their slotted pivotal joint 90, these being the front set of levers in the locking mechanism.

The crank levers 88 and 89 are pivotally secured to the under side of the under table 86 adjacent to the front of the desk, and are connected by the rods 91 and 92 to the dogs 79.

The rods 83 and 84, and 91 and 92 are mounted in the guides 93 and the dogs 79 and 80 slide in the guides 94, said guides 93 and guides 94 being secured to the under table 86 on the under side, thereby insuring a rigid engagement with the racks 77 and 78.

The slotted pivotal joint 90 is connected by the rod 95 with the operating lever 96, the latter being in rocker arm form, and having a pivoted pin 97 extending from the upper end

to a pivotal connection with said rod 95, said pin having grooves 98 and 99 in the periphery thereof where it is engaged by the spring 100.

5 The spring 100 is mounted in the plate 101, through which the pin 97 projects, and also through said spring, and this plate 101 forms part of a push rod casing 102 in which the rocker arm, or lever 96 is pivoted.

10 The push rod 103 is flexibly secured to the upper end of the lever 96, and the push rod 104 is flexibly secured to the lower end of the lever 96; consequently, on pushing the upper rod the crank levers 81 and 82, and 15 88 and 89 will be swung on their pivots and thereby bring the dogs 79 and 80 into engagement with the racks 77 and 78, while to release them the lower push rod is operated, and this acts directly on the connecting rods 20 and swings the crank levers and releases the dogs from engagement, the slight spring pressure on the pins 97 being sufficient to hold the crank levers in one or other of the positions, as the case may be.

25 The operation of this form of the invention differs materially from the other forms in the fact that the upper panels move vertically instead of swinging inwardly, and in lifting the top boards upwardly, the said 30 boards take the shape of the accounting desk of themselves without other aid, and naturally when they are lowered they take the flat shape, as already explained. The compensating weights in the side recesses insure easy operation in elevating the desk, 35 and as they are so nearly balanced with the weight of the top and the end panels they make little or no difference in lowering the desk to its lower level. Furthermore, it must 40 be noted that in this form of desk the standing height of the desk may be adjusted to suit the person, this doing away with footstools and adjustable seat stools.

The remainder of this form of the desk 45 is shown in the side cabinet 105 moving on casters 106 very similar to those already described, but in addition to this cabinet, I have shown a fireproof box 107, which belongs in the recess between the desk top 50 boards 73 and 74 and the under table 86, and this box is made of three layers, for the most part, one layer 108 being of wood on the outside, another layer 109 being of wood on the inside, and in the middle asbestos in 55 paper form. This box is covered in by the lid 111, which is joined to the top near the back thereof by a hinge 112, and at the joint the inside is formed of a V-shaped recess 113 in which a fold 114 of the asbestos 60 paper lining is made, the said paper lining continuing to the end of the lid, and preferably turned over with the end 115, which meets the front of the box.

In Fig. 23 the form of the invention is an 65 office table having the elevatable top in the

middle part 125, to which the leaves 116 and 117 are hinged, this top being shown as raised by the end panels 118, disappearing into the recess 119 between the permanent lower panels 120 and 121 at each end, and 70 secured to the middle part 115; otherwise, there is nothing else that is different from the variations of the invention as already described.

In Figs. 24 and 25, the invention is shown 75 as applied to a typewriter desk. There is no change in Fig. 24 beyond the trap-doors 126 and 127 on one of which a typewriter 128 may be mounted and on the other a calculating machine. 80

The boxes 129 and 130 are provided in the under table 131 so that the machines may be used in a sit-down or stand-up position. The desk top 132 is elevated from the 85 frame 133 as already explained and held by the panels 134.

In Fig. 25 the use of a typewriting machine is shown with the accompanying 90 drawer or box frame 135. The lid 136 of the box is thrown back and carries the machine 137 and the gate legs 138 are swung outwardly to support the reversed lid and machine; thus the drawer or box frame becomes a typewriting desk for the personal 95 convenience of the occupant of the desk.

It must be understood that this invention, in its detailed construction as pointed out here, is liable to be changed to some extent 100 through the development of the industry emanating therefrom, but these changes will not be a departure from the spirit of the invention, as the claims for novelty following fully set forth the said invention in its broadest sense.

What I claim is: 105

1. A desk comprising a frame supported from the floor at each corner, a table top having a writing section and a ledge section hinged together and having supports from 110 writing section and ledge projecting downwardly into and vertically slidable in said frame adjacent to the ends, a plurality of cables engaging said table top supports at the lower portions thereof and passing over 115 pulleys for lifting said writing and said ledge sections of the top, weights attached to said cables and approximating the weight of the table and its supports and panels at the ends forming rigid supports for the writing top and ledge in the extreme high 120 position of said table top.

2. A desk comprising a frame supported from the floor at each corner, a table top having a writing section and a ledge section 125 hinged together and having supports from writing section and ledge projecting downwardly into and vertically slidable in said frame adjacent to the ends, a plurality of cables engaging said table top supports at the lower portions thereof and passing over 130

5 pulleys for lifting said writing and said ledge sections of the top, weights attached to said cables and approximating the weight of the table and its supports and end panels shaped to rigidly support the table top at its extreme upper position, the writing section on a slant and the ledge section level.

10 3. A desk comprising a frame supported from the floor at each corner, a table top having a writing section and a ledge section hinged together and having supports from writing section and ledge projecting downwardly into and vertically slidable in said frame adjacent to the ends, a plurality of
15 cables engaging said table top supports at the lower portions thereof and passing over pulleys for lifting said writing and said ledge sections of the top, weights attached to said cables and approximating the weight
20 of the table and its supports and end panels hinged to the frame and having sliding joints connecting them to ledge and writing sections of the table top.

25 4. A desk comprising a frame supported from the floor at each corner, a table top having a writing section and a ledge section hinged together and having supports from writing section and ledge projecting downwardly into and vertically slidable in said
30 frame adjacent to the ends, a plurality of cables engaging said table top supports at the lower portions thereof and passing over pulleys for lifting said writing and said ledge sections of the top, weights attached to
35 said cables and approximating the weight of the table and its supports and panels adapted to lift the table top to its extreme high position in the shape required for a stand desk of slanting writing top and
40 ledge.

45 5. A desk comprising a frame supported from the floor at each corner, a table top having a writing section and a ledge section hinged together and having supports from writing section and ledge projecting downwardly into and vertically slidable in said frame adjacent to the ends, a plurality of

cables engaging said table top supports at the lower portions thereof and passing over pulleys for lifting said writing and said
50 ledge sections of the top, weights attached to said cables and approximating the weight of the table and its supports and pieces supporting the table top in its position of writing top and ledge sections and a rear writing
55 top extension hinged to the outer edge of the ledge section having bracket supports and completing a double standing desk.

6. A desk comprising a frame supported from the floor at each corner, a table top covering in the frame and formed of two sections secured together in a V-joint to insure a flush surface in its flat position and a bend in its raised slanted position, front posts carrying the slanting and writing section of
65 the top and rear posts carrying the level and ledge section of the top and vertically slidable in said frame, cables on pulleys attached to said posts, weights attached to said pulleys and balancing the top end panels supporting the top in its uppermost position,
70 equalizing rods pivotally connected in pairs, one pair pivotally joining one panel and the frame and the other joining the other panel and the frame, and weights lifting said rods
75 and consequently said panels.

7. A desk comprising a frame standing on suitable corner supports and forming in the top thereof a recessed panel and safe deposit compartment with fireproof lining, a
80 table top lined and closing in said compartment and having post extensions downwardly into said frame, cables and weights balancing said table top, panels lying flat in said compartment in the closed position and
85 rigidly supporting the top in the standing position of the desk and an inner removable compartment of fireproof construction and contained in said compartment between the
90 panels.

Signed at Montreal, Quebec, Canada, this 20th day of December, 1920.

JOHN MICHAELS.