Sept. 8, 1953 J. D. FOWLER ET AL 2,651,354

CHAIR WITH ACCESS PREVENTING MEANS

Filed July 2, 1948

9 Sheets-Sheet 1

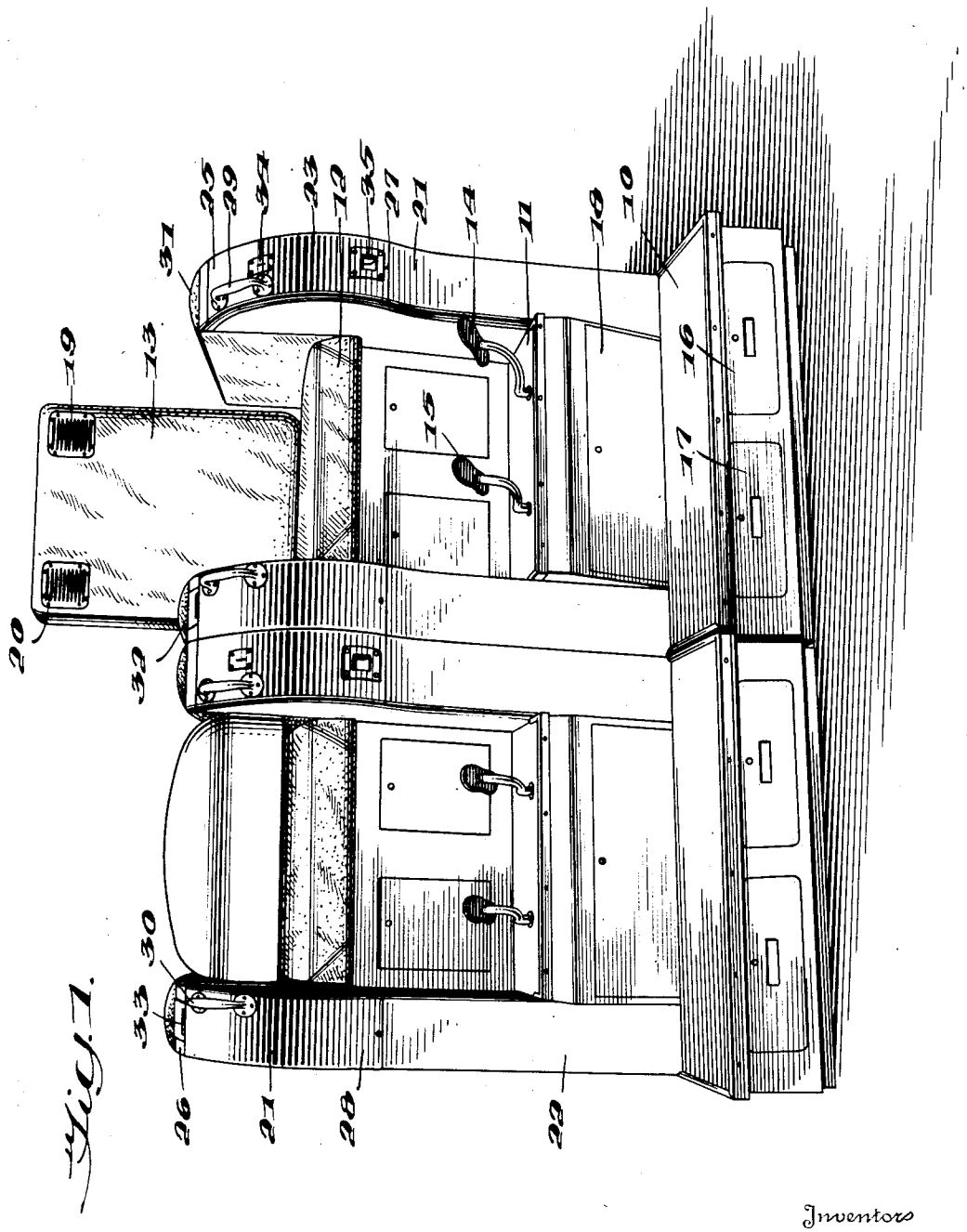


Fig. 1.

Inventors
JEFFERSON D. FOWLER,
RALPH A. VAUGHN,

By Robert B Pearson
Attorney

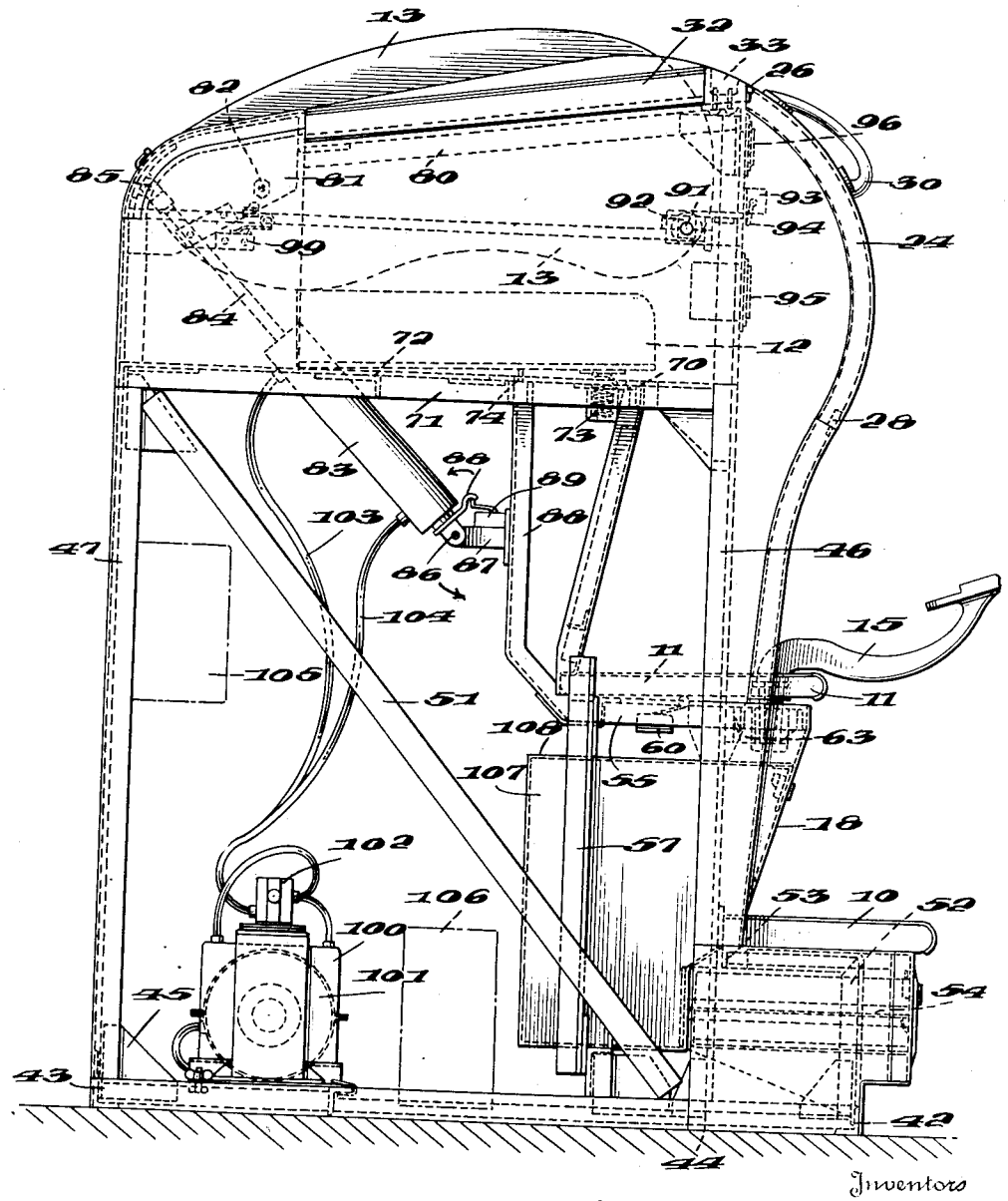
Sept. 8, 1953 J. D. FOWLER ET AL 2,651,354

CHAIR WITH ACCESS PREVENTING MEANS

Filed July 2, 1948

9 Sheets-Sheet 2

Fig. 2.



Inventors

JEFFERSON D. FOWLER,
RALPH A. VAUGHN,

By Robert B Pearson

Attorney

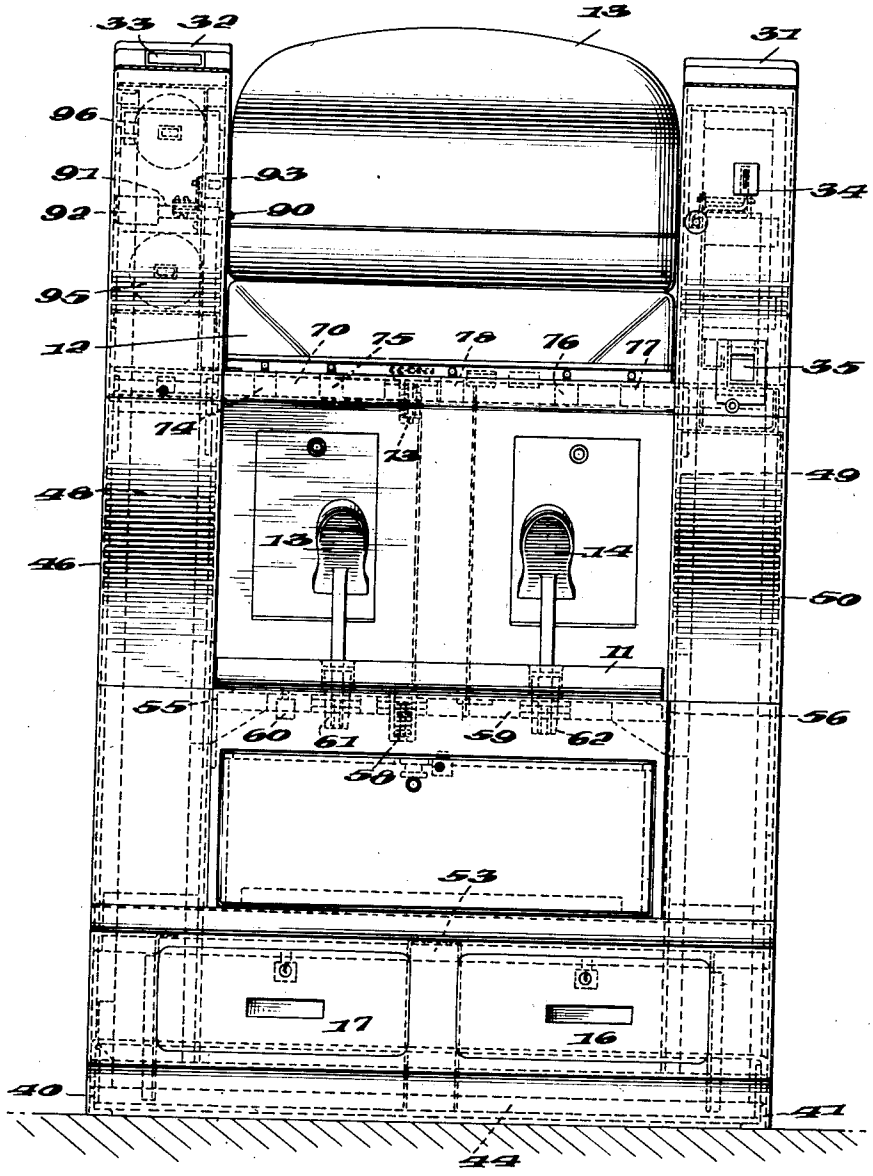
Sept. 8, 1953 J. D. FOWLER ET AL 2,651,354

CHAIR WITH ACCESS PREVENTING MEANS

Filed July 2, 1948

9 Sheets-Sheet 3

Fig. 3.



Inventors

JEFFERSON D. FOWLER,
RALPH A. VAUGHN,

By Robert B Pearson

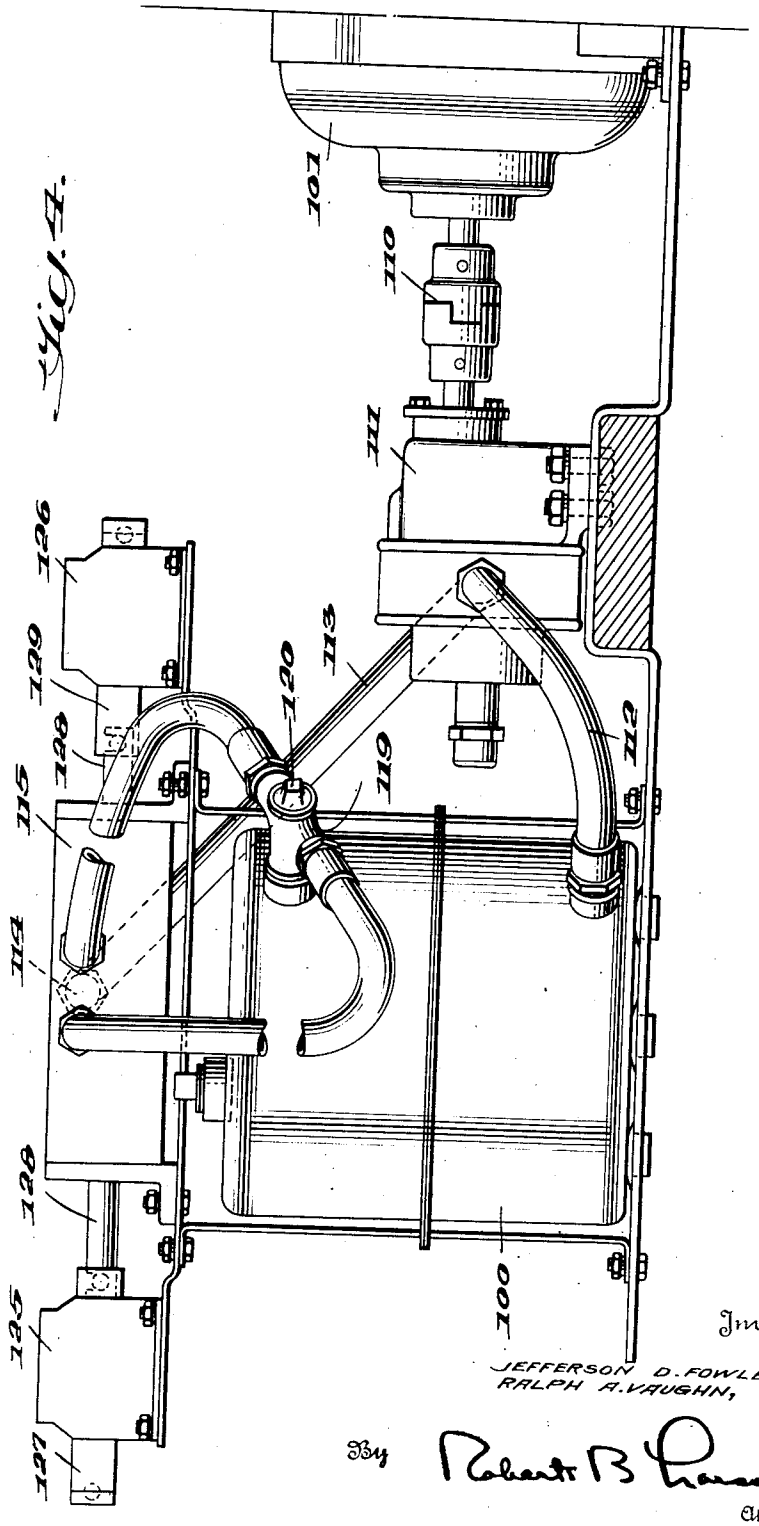
Attorney

Sept. 8, 1953 J. D. FOWLER ET AL 2,651,354

CHAIR WITH ACCESS PREVENTING MEANS

Filed July 2, 1948

9 Sheets-Sheet 4



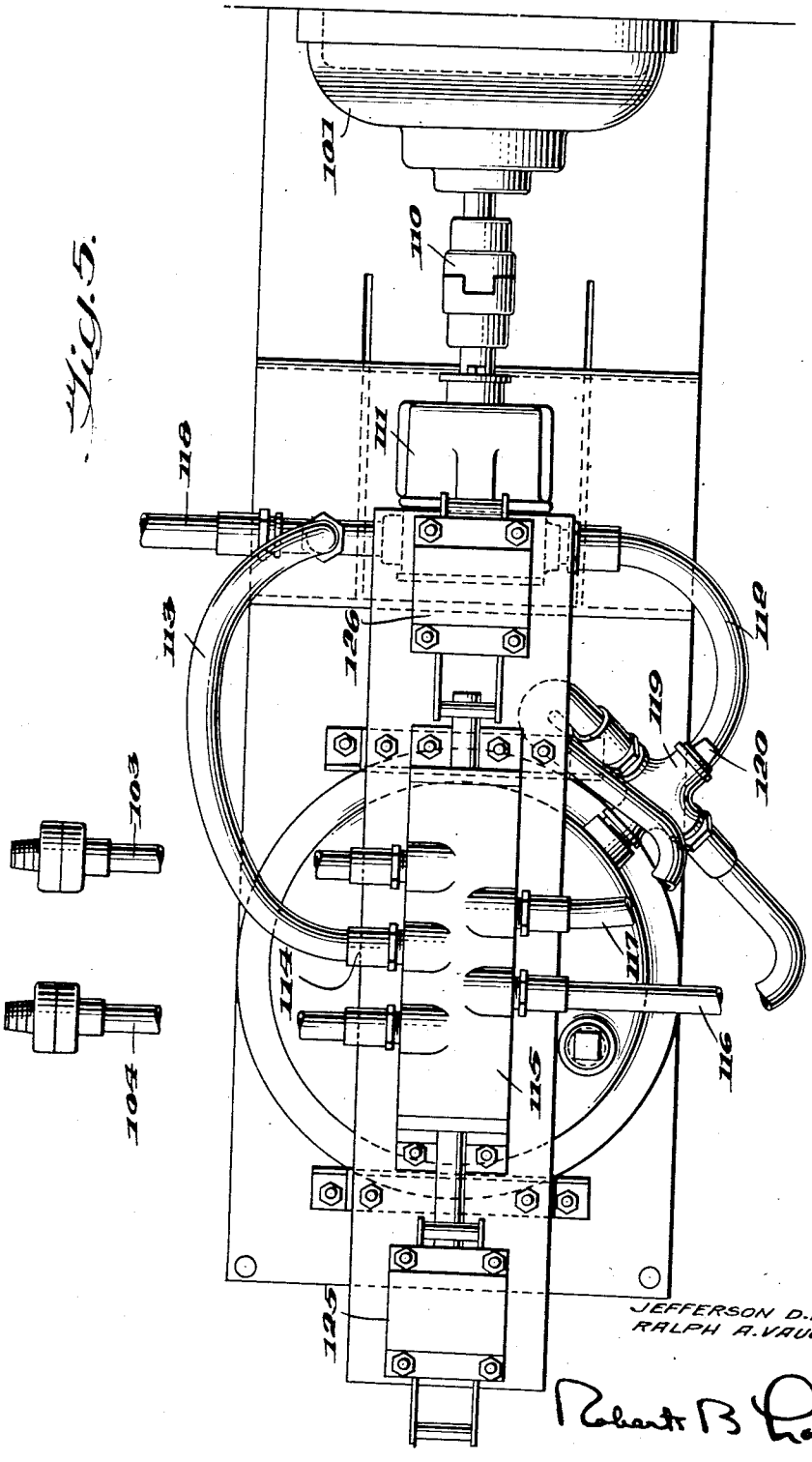
Inventors
JEFFERSON D. FOWLER,
RALPH A. VAUGHN,
By Robert B Pearson
Attorney

Sept. 8, 1953 J. D. FOWLER ET AL 2,651,354

CHAIR WITH ACCESS PREVENTING MEANS

Filed July 2, 1948 9 Sheets-Sheet 5

Fig. 5.



Inventors
JEFFERSON D. FOWLER,
RALPH A. VAUGHN,
Robert B Pearson
Attorney

Sept. 8, 1953 J. D. FOWLER ET AL 2,651,354

CHAIR WITH ACCESS PREVENTING MEANS

Filed July 2, 1948

9 Sheets-Sheet 6

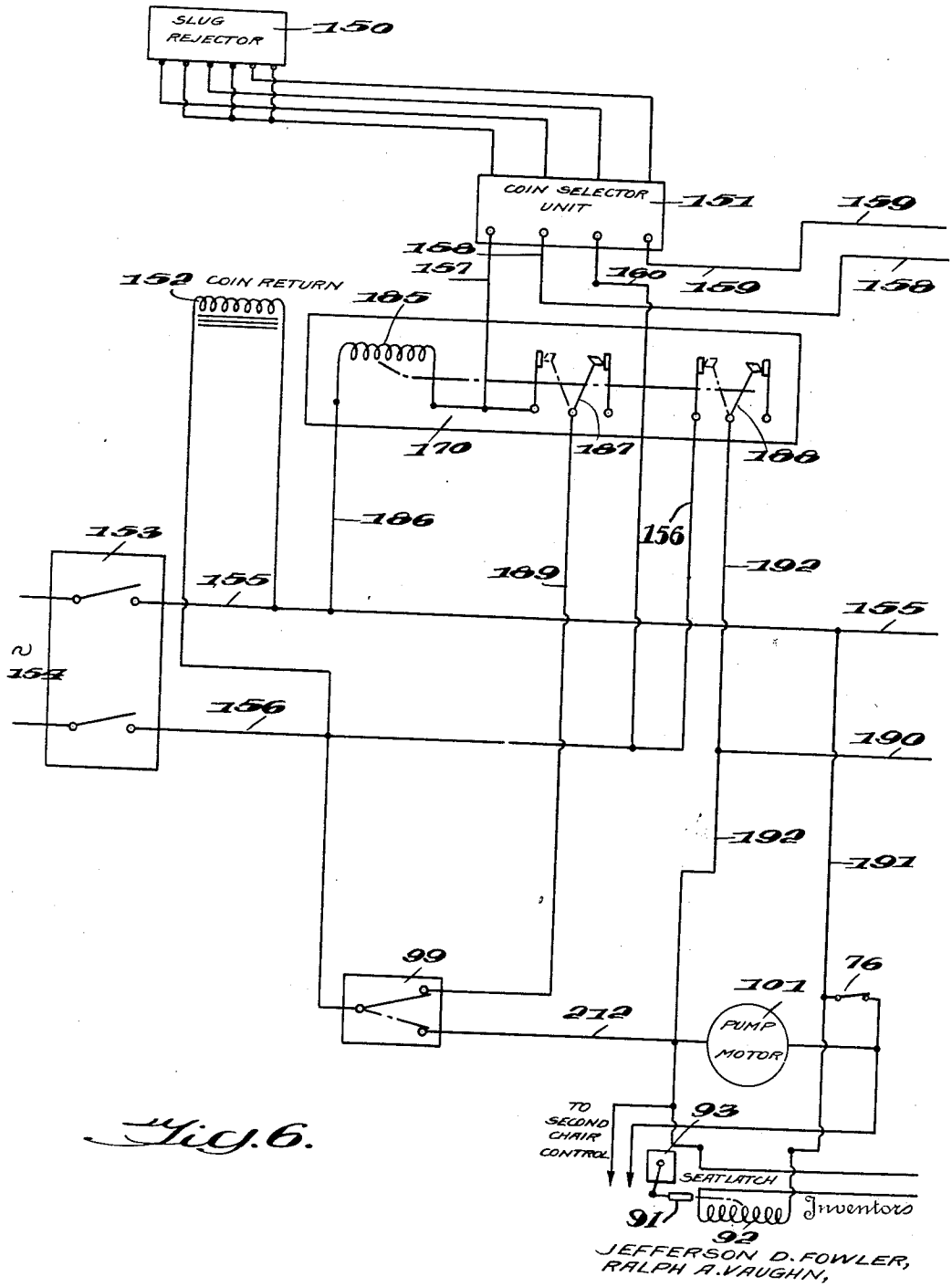


Fig. 6.

Inventors
JEFFERSON D. FOWLER,
RALPH A. VAUGHN,

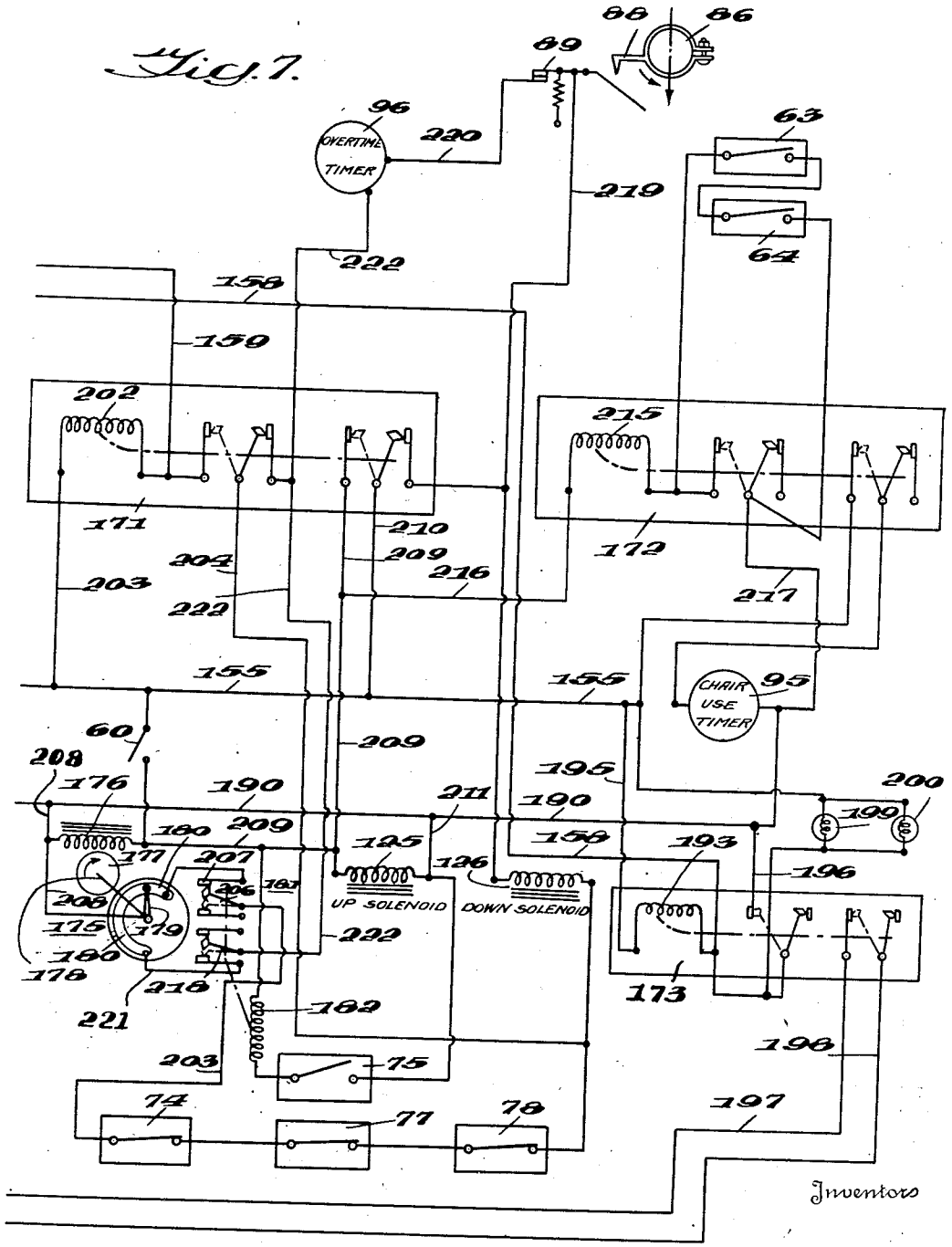
By Robert B. Chaney
Attorney

Sept. 8, 1953 J. D. FOWLER ET AL 2,651,354

CHAIR WITH ACCESS PREVENTING MEANS

Filed July 2, 1948 9 Sheets-Sheet 7

Fig. 7.



Inventors

JEFFERSON D. FOWLER,
RALPH A. VAUGHN,

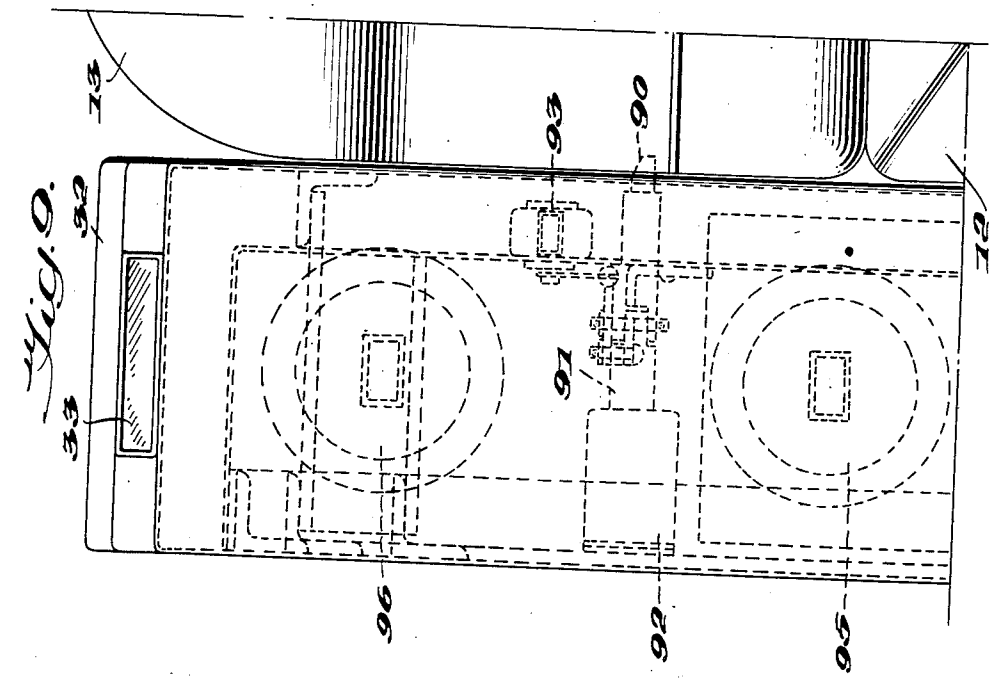
By Robert B. Chapman
Attorney

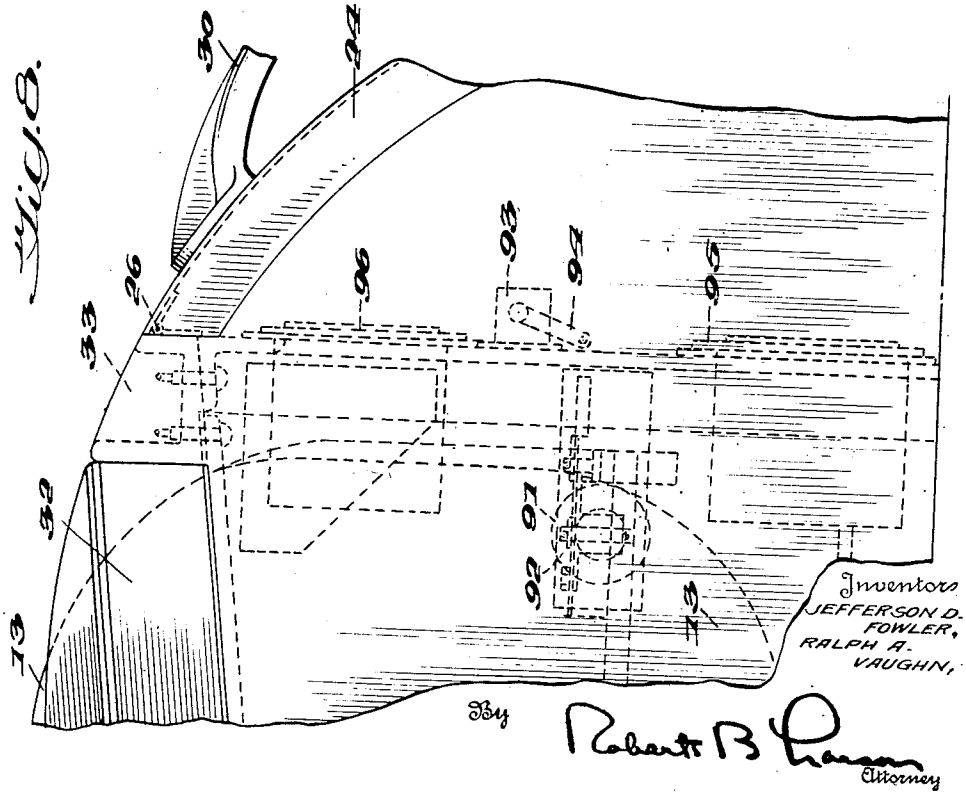
Sept. 8, 1953 J. D. FOWLER ET AL 2,651,354

CHAIR WITH ACCESS PREVENTING MEANS

Filed July 2, 1948

9 Sheets-Sheet 8





Sept. 8, 1953 J. D. FOWLER ET AL 2,651,354

CHAIR WITH ACCESS PREVENTING MEANS

Filed July 2, 1948 9 Sheets-Sheet 9

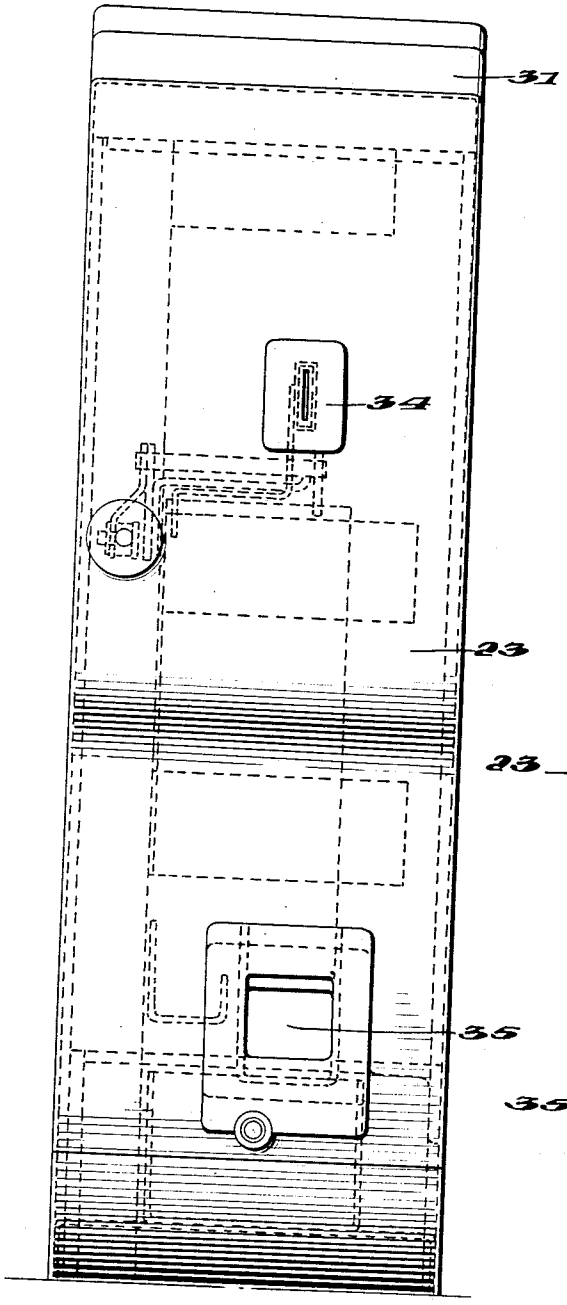
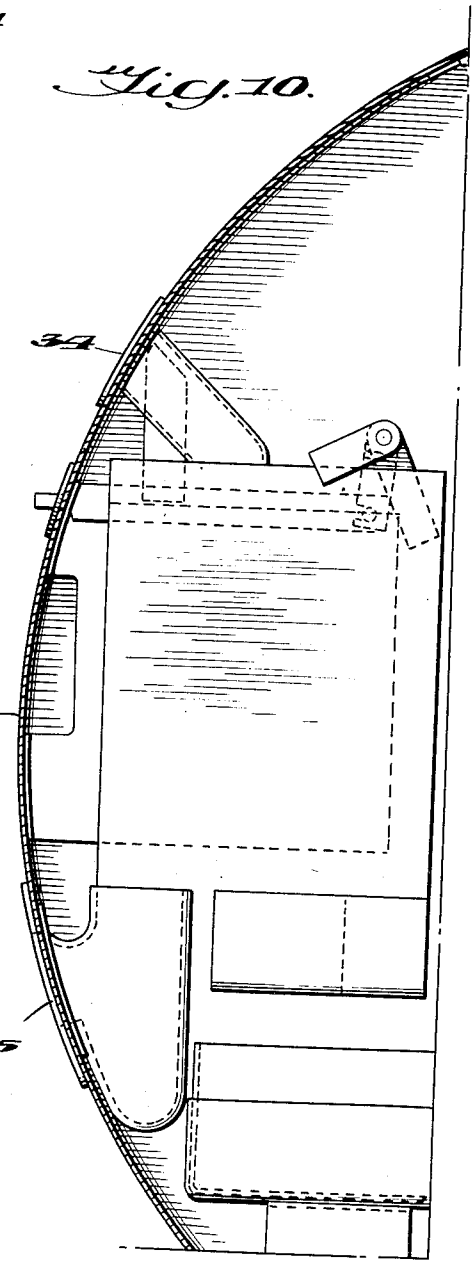


Fig. 11.

Fig. 10.



Inventors
JEFFERSON D. FOWLER,
RALPH A. VAUGHN,

By Robert B Pearson

Attorney

Patented Sept. 8, 1953

2,651,354

UNITED STATES PATENT OFFICE

2,651,354

CHAIR WITH ACCESS PREVENTING MEANS

Jefferson D. Fowler and Ralph A. Vaughn,
Los Angeles, Calif.

Application July 2, 1948, Serial No. 36,708

26 Claims. (Cl. 155—188)

1

The present invention relates to chairs, and more particularly to improvements in a coin controlled chair or seat of the type in which the use of the chair may be authorized and permitted only after payment of a coin through conventional coin slot devices.

The coin controlled chair of this invention is primarily intended for use as a shoe shine chair and is an improvement over the coin controlled shoe shine chair of our previous invention described in our co-pending patent application for U. S. Patent, Serial No. 656,850, filed March 25, 1946. Coin controlled chairs of the type having means to prevent the use of the chair unless a coin is deposited as rental are well known and in our co-pending application we described a chair for use in shoe shining establishments so that the owner does not have to maintain a large staff of supervisors and cashiers, together with elaborate bookkeeping practices in order to operate his business. Prior to this invention, however, the use of such coin controlled chairs for this purpose has not been entirely satisfactory in that at least one owner's representative would have to be present at all times in order to prevent any attempts by either the customer or the shine boy to defeat the proper operation of the chairs. For example, if the shine boy is inclined to loiter in his work and the customer does not object, once the coin has been deposited in any of the previous forms of coin controlled chair constructions, the chair could remain continuously occupied for an indefinite period of time without the owners' knowledge, while the shine boy consumes an excess of time to complete the shoe shine. Additionally, with the previous forms of coin controlled chair constructions which have been especially adapted for use as shoe shine chairs, it was possible for the shine boy improperly to hold the chair open for a second customer and convert to his own use the revenue which had thus been diverted from the chair rental coin slot. This will be understood when it is pointed out that such chairs must be designed first of all to provide safety and comfort for the customer and that therefore the chair locking apparatus must be sufficiently flexible to prevent any possibility of injury to a customer in opening or closing the chair.

It is therefore a principal object of this invention to provide a combined coin controlled chair and register construction which upon payment of a coin will authorize and permit the use of the chair for a determinate period of time and which will automatically record the period of time of any unauthorized use of the chair.

It is also an important object of this invention to provide a coin controlled chair construction having a pair of foot rests and specifically intended for use as a shoe shine chair and further

2

having means to record the exact period elapsing from the time the foot rests are placed in their sockets until they are removed.

It is a further object of this invention to provide an automatically operated coin controlled chair having coin controlled hydraulic means for raising and lowering the chair back over the seat to open or close the chair and to permit authorized use of the chair for a determinate period of time, and further having time controlled and associated weight or position responsive means to record and indicate the period of time of any unauthorized use of the chair such as overtime seating or direct interference with the normal closing of the chair back to keep the chair open beyond the authorized time.

Still another object of the invention is to provide a coin controlled chair construction having hydraulic operating means for opening and closing the chair, together with a coin responsive electrical control circuit for the hydraulic operating means, and including an adjustable master time control element in the control circuit for adjustably predetermining the length of the authorized period of time for using the chair and for initiating the operation of suitable time recorders for indicating the overtime or unauthorized use of the chair and the total period of time during which the chair is open.

Another object of this invention is to provide a coin controlled chair especially adapted for shoe shining establishments and having means for recording the number of times the chair is opened or unlocked, together with means to record the elapsed time during which the chair is in use for shoe shining purposes, thus enabling the average time per shoe shine to be determined and providing a means for registering and checking the chair revenue.

Other objects and advantages of this invention will become known with reference to the following specification and drawings in which:

Fig. 1 is a perspective view showing two similar chairs of the invention in side by side relation with one chair open and one chair closed;

Fig. 2 is a side elevation of the chair in closed position with a portion of the bottom side panel removed;

Fig. 3 is a front elevational view of the chair in closed position;

Fig. 4 is an enlarged fragmentary side elevation of the hydraulic pump system and control valves;

Fig. 5 is a plan view of the apparatus shown in Fig. 4;

Figs. 6 and 7 are complementary parts of the wiring diagram for the electric control circuit for the chair;

Fig. 8 is an enlarged fragmentary detail in side

elevation of the chair arm enclosing the latch solenoid, latch register and timers;

Fig. 9 is a front elevation similar to Fig. 8;

Fig. 10 is an enlarged fragmentary detail in side elevation of the chair arm enclosing the coin responsive control mechanisms; and

Fig. 11 is a front elevation similar to Fig. 10.

Referring to Fig. 1 of the drawing wherein two chairs embodying the features of this invention are shown in side by side relation, it will be seen that each of the chairs has a lower step or platform 10, an upper or chair step 11, and an upholstered seat back 13 which is pivoted to the back of the chair frame and adapted to be lowered to cover the seat 12, as shown, to prevent access to the chair. A pair of removable foot rests 14 and 15 are provided and the manner of supporting the foot rests on the step 11 will be later described in detail. Positioned beneath the platform 10 are a pair of drawers 16 and 17 which are adapted to contain the shoe shining equipment. A hinged door 18 having a lock gives access to a large storage space in which the foot rests 14 and 15 may be stored when not in use.

Louvres 19 and 20 are fitted to the seat back 13 as shown and electric lights are positioned behind the louvres to provide reading illumination when the chair is open for occupancy.

The side arms 21 and 22 of each of the chairs are adapted to contain certain of the operating mechanisms shown in detail in Figures 8–11 of the drawings as will be later described, and are provided with covers or doors 23 and 24 hinged respectively at 25 and 26 and latched at 27 and 28. To assist a person in using the chair, grab handles 29 and 30 are fastened to the covers 23 and 24. The upper surfaces of the side arms are upholstered at 31 and 32 to provide arm rests which may be hinged at the top to be opened to provide access to magazine storage racks within the arm rest. Contained within the side arm 21 are the coin responsive devices, such as the coin selector and slug rejector. A coin slot 34 together with a coin return chute 35 are mounted on the hinged cover 23. An ash tray with a hinged cover 33 completes the general description of the chair and its external appearance.

Referring now to the drawings and particularly Figures 2 and 3 for a more detailed description of the mechanical features of the chair wherein a large part of the framework of the chair is shown in dotted lines with some omissions in order to clarify the drawings, it will be seen that the chair frame includes the base frame members 40, 41, 42 and 43 fastened together, as shown, together with an additional base cross member 44. Fastened by welding or otherwise to the base members 40, 41, 43 and 44 with triangular reinforcement gussets, such as shown at 45, are a number of vertical frame angle members, some of which are shown at 46—50. A diagonal frame member 51 is provided on each side of the chair.

The operating platform 10 is supported on a number of right angle supports, such as shown at 52, fastened to the front frame cross member 42, and a cross member 53 which is supported from the vertical supports 46, 48, 49 and 50. The shine equipment drawers 16 and 17 are supported on conventional drawer runs such as shown at 54. The chair step 11 is generally supported on frame members 55 and 56 which are fastened to the vertical supports 48 and 49 and additional vertical frame members such as shown at 57. The chair step 11 is resiliently supported at the front on a spring cushion 58 carried by a frame cross member 59 and a micro-switch 60 is mounted for actuation by the weight of a person standing on the step 11 or resting a foot on the foot rests 14 and 15. The foot rests 14 and 15 are removably supported in sockets 61 and 62 mounted on the step 11, and each of the foot rest frame sockets is provided with a resilient wall surface in association with a micro-switch such as shown at 63 to be actuated when the foot rests are inserted in their sockets. The micro-switch 64 for foot rest 14 is not shown in Figures 3 and 4, although it is referred to and shown in Figure 7.

The seat 12 is generally supported on suitable horizontal frame members, some of which are shown at 70, 71 and 72. A spring cushion 73 resiliently supports the front of the seat 12 and a number of micro-switches 74, 75, 76, 77 and 78 are mounted so as to be responsive to the movement of the seat when a customer is seated. It may be desirable to distribute the micro-switches 74—78 in such manner as to prevent their actuation unless the weight of a person is distributed over the seat as in a sitting position. This will be better understood after the automatic cycle of the machine is described.

The seat back 13 is pivotally supported at each side by a pivot 82 on the gusset member 81 which is fastened to the arm rest frame member 80 and a vertical support such as 47. It will be understood that all of the supporting frame members and cross members are not shown or referred to in detail in order to clarify the drawings and their exact arrangement may be varied to accommodate production requirements. The seat 13 is raised or lowered about the pivot 82 by a hydraulic cylinder 83 having a piston rod 84 pivotally connected to the seat back at 85. The hydraulic cylinder is pivotally supported at 86 to a bracket 87 carried by the vertically extending portion 88 of the frame member 55. When the seat back 13 is raised or open, the hydraulic cylinder is pivoted slightly at 86 in the direction of the arrow to cause a striker arm 89 to actuate a micro-switch 89 as will be referred to again in detail. Also when the seat 13 is closed or opened, a micro-switch 99 is actuated. The micro-switch 99 is designated as the "latch switch" and is shown on Fig. 6 of the drawings. The seat back 13 is provided with a latching groove 90 to cooperate with a latch 91 actuated by a solenoid 92 to release the seat latch when the solenoid 92 is energized. A mechanical register or counter 93 is linked at 94 to the latch mechanism so that it will operate each time the seat is opened and therefore will register each cycle of opening and closing the seat.

It will be noted that the cycle register 93 is mounted behind the hinged side cover 24 which may be unlocked at 28 and raised to inspect the register. Also mounted behind the cover 24 are the electrical timers 95 and 96 which will be later referred to in detail in connection with Figures 6 and 7 of the drawings.

Mounted within the interior of the chair frame in any suitable position are various other components, such as the hydraulic power system including the fluid reservoir 100, pump motor 101 and solenoid actuated hydraulic valve 102 connected by flexible hoses 103 and 104 to the hydraulic cylinder 83. The enclosure for the electrical master control switch is generally shown in outline at 105 and the coin selector mechanism is shown at 106 to be enclosed within the bottom of the sidearm 21. The storage space be-

hind the door 18 is shown at 107 and is defined by the sheet metal walls 108. The various elements of the electrical control circuit to be described are mounted in any suitable manner (not shown) within the chair frame.

Referring to Figures 4 and 5 of the drawings, wherein the hydraulic power system and controlling or reversing valves are shown in detail, it will be seen that an electric motor 101 is connected by the coupling 110 to the hydraulic pump 111 having inlet and outlet connections 112 and 113 respectively. The pump inlet 112 is connected to the bottom of the fluid reservoir 100 while the outlet 113 is connected at 114 to the hydraulic distribution valve 115 hereinafter to be referred to as the "reversing valve." Depending upon the position of the valve 115, fluid under pressure is supplied through either of the flexible hoses 103 or 104 to the hydraulic cylinder 83 to raise or lower the chair seat back 13 and the fluid pressure from the cylinder is returned to the reservoir 100 through either conduit 116 or 117. Since it may be desirable to operate two or more chairs as shown in Figure 1 from a single hydraulic power source, the pump 111 is provided with an additional outlet 118 for connection to another chair hydraulic control valve and the fluid may be returned to the reservoir through the fitting 119 by removing the plug 120.

In order to control the position of the reversing valve 115, a pair of solenoids 125 and 126 are provided. The armature 127 of solenoid 125 is connected to one end of the operating shaft 128 for the reversing valve 115 and similarly the armature 129 of solenoid 126 is connected to the other end of the valve operating shaft. The solenoid valve assembly thus described is of the type which will remain in the position to which it was last moved, after the solenoids are deenergized, so that if the solenoid 125 is energized and subsequently deenergized, the valve will remain in the position for supplying fluid under pressure to conduit 104 and will thus tend to open the chair seat back 13. Valve solenoid 125 may be designated as the "up" solenoid and valve solenoid 126 may be designated as the "down" solenoid.

The electric control circuit for the chair is shown by the complementary wiring diagram of Figures 6 and 7 of the drawings. Referring to Figure 6, a slug rejector 150 and a coin selector unit 151 are electrically connected together and function in a known manner in association with a coin return electro-magnet 152 to receive the proper coin and initiate operation of the chair. The master control switch 153, when closed, connects the current source 154 to lines 155 and 156 so that until the master control switch 153 is closed to prepare the chair for business, the coin return electro-magnet 152 is deenergized and a coin placed in the coin slot 34 will be returned at the coin chute 35. The coin selector unit 151 is of the type which will momentarily connect, through separate switches, lines 157, 158 and 159, with line 160 as the coin passes through. The slug rejector 150 and the coin selector unit 151 may be of any well known, commercially available, types which provide the foregoing requirements, and therefore will not be described in detail at this time.

Referring now to both Figure 6 and Figure 7 of the drawings, a number of double pole double throw solenoid actuated switches or relays 170, 171, 172 and 173 are shown in the normally deenergized position, before a coin is deposited in

the coin slot. Relay switch 170 may be designated as the "pump motor control relay" and relay switch 171 is the "reversing relay" for controlling the solenoid actuated hydraulic reversing valve 115. Relay switch 172 is the chair use electric timer control and relay switch 173 is the seat latch solenoid release and light control.

As previously described, micro-switches 74—78 are positioned under the seat 12 to be responsive to the weight of a person sitting in the chair. The seat micro-switches 74, 77 and 78 are connected in series and are normally closed to be opened when the seat 12 is sat in or otherwise used. Seat micro-switch 76 is also normally closed and adapted to be open when the seat is used, while micro-switch 75 is of the normally open type and is positioned to be closed when the seat is used. The latch switch 99 is shown with its switch arm in the contact position which it assumes when the chair is closed and the seat back 13 is lowered down over the seat 12 to prevent access to the chair. The latch release solenoid 92 is shown with its associated latch 91 and mechanical register 93.

Referring now to Figure 7 of the drawing, the foot rest micro-switches 63 and 64 are connected in series and are of the normally open type adapted to be closed when the foot rests are inserted in their sockets. The micro-switch 89 associated with the striker arm 88 is of the normally closed type adapted to be opened when the seat back 13 is closed and locked in the down position. As shown in Figures 2 and 7 of the drawings, the striker arm 88 is associated with the hydraulic cylinder 83 pivoted at 86 so that when the seat back 13 is fully raised, the switch 89 and striker arm 88 are in the positions shown in Figure 7.

A master control clock timer is generally shown at 175 and includes a synchronous clock motor 176 having a rotor 177 and shaft 178 driving a combined timer hand and switch contact 179. Associated with the timer hand contact 179 is an arcuate contact strip 180 which may be adjustably positioned with respect to the timer hand 179. The timer hand 179 is shown in the zero start position and the section of the arcuate contact strip to the right of the timer hand may be adjusted in length to provide electrical contact with the timer hand 179 for a period of time within the range of, say, 5 to 60 seconds to give the customer time to enter the chair before the authorized time period. The clock timer 175 is of the type in which the timer hand 179 returns to zero start position when the timer motor field 176 is deenergized, but only after the timer motor has been running for a period of substantially more than 60 seconds. The other end of the arcuate contact strip 180 is also adjustable to provide contact with the timer hand 179 after a determinate time period of, say, 5–30 minutes. The time period during which the timer hand 179 moves out of contact with the arcuate contact strip 180 is the authorized period of time during which the chair may be used without a record of overtime or seat interference. It may be desirable to adjust the length of such time period in the master control timer 175 in accordance with the denomination of coin received in the coin selector 151, although no such mechanism is specifically disclosed. Associated with the arcuate contact strip 180 are the contacts of a double pole double throw relay 181 shown in the deenergized position, and having a relay coil 182 for moving the contacts to the dotted line posi-

tion. The step micro-switch 60 is shown to be of the normally open type adapted to be closed when the step 11 is used, and is connected to energize the master control timer when the step is used to gain access to the chair.

It is believed that the wiring diagram shown in Figures 6 and 7 may be best described in connection with the operation of the control circuit. The master control switch 153 is closed and the current source is then connected to lines 155 and 156 to ready the chair for operation. Upon receipt of a coin of proper denomination in the coin selector unit, the relay coil 185 of motor control switch 170 is momentarily connected and energized through lines 186, 157, 160 to lines 155 and 156. The switch arms 187 and 188 are thus moved to the dotted line position, establishing a holding circuit for the relay coil 185 through line 189 and the latch switch 99, and also connecting through switch arm 188, lines 190 and 192 to line 156. Thus the pump motor 101 is energized through the normally closed seat switch 76, lines 191 and 192 to lines 155 and 156. At the same time the coil 193 of the latch control relay 173 is momentarily connected through lines 195, 158, coin selector unit 151, line 160 to lines 155 and 156. The switch contacts of relay 173 are thus moved to the dotted line position to establish a holding circuit through lines 195 and 196 to lines 155 and 190 to maintain the relay energized as long as there is current in lines 155 and 190. The energization of relay 173 connects lines 197 and 198 to energize the latch release solenoid 92 to release the seat back 13 for upward movement. Seat lights 199 and 200 are also energized while the latch release relay 173 is energized. At the same time that a coin is passing through the selector unit, the coil 202 of the reversing relay 171 is momentarily energized through lines 203, 159 and 160 to lines 155 and 156, thus moving its switch arms to the dotted line position and establishing a holding circuit through lines 203 and 204, normally closed seat switches 78, 77 and 74, line 203, arm 206, switch contact 207, arcuate contact strip 180, timer hand 179 and line 208 to lines 190 and 156. The holding circuit for relay coil 202 thus described is effective while the seat is unoccupied, and seat switches 74, 77 and 78 are closed until the timer hand has advanced from the zero start position shown, to beyond contact with the contact strip 180, which is the adjustable time period of 5–60 seconds previously mentioned for allowing the customer to enter the chair. Energization of relay coil 202 also connects the timer motor field 176 through lines 208, 209 and 210 to lines 155 and 190, thus energizing the master control timer and starting the timer hand clockwise from the zero start position shown. The "up" solenoid 125 is also energized through lines 209, 210 and 211 to lines 155 and 190 to move the hydraulic valve to the up position.

With the above described sequence completed, upon payment of the coin, the seat back 13 is unlatched and is hydraulically raised to the open position by means of cylinder 83. As soon as the seat back rises, the latch switch 99 is moved to the dotted line position, thus breaking the holding circuit for the motor relay 170, but maintaining the connection between lines 190 and 156 through lines 192 and 212 so long as the seat back remains unlatched. Thus the pump motor 101 continues to run with the seat back raised. In the event the seat is not used within the 5–60 second interval, the timer hand 179 moves out of contact with the contact strip 180 and the holding circuit for relay coil 202 of the reversing relay 171 is broken, thus returning the relay switch arms to the solid line position and deenergizing the master timer clock motor 176 and the "up" solenoid 125. The seat back remains in the open position, due to the hydraulic pressure, since the pump motor 101 is still running. The master control timer remains in the position with the timer hand 179 moved just out of contact with the contact strip 180. In the event the seat is used before the end of the 5–60 second interval, the normally closed seat switches 74, 77 and 78 are opened to break the holding circuit for the reversing relay coil 202 which returns the switch 171 to the solid line position shown, and the seat switch 76 is opened, opening the pump motor circuit to stop the pump.

As soon as a customer steps on the step 11 to use the chair, the normally open step switch 60 is closed to again energize the master control clock timer motor 176 and start the timing of the authorized period of use for the chair, during which the timer hand 179 moves out of contact with the arcuate contact strip 180. At the same time the coil 215 of the timer relay switch 172 is connected by lines 216, 217 and 209 through the now closed step switch 60 to be energized from lines 155 and 190 when the series connected foot rest switches 63 and 64 are closed by insertion of the foot rests 13 and 14. When the timer relay 172 is thus energized, a holding circuit is established through lines 216 and 217 to continue its energization until lines 155 and 190 are deenergized upon the latching of the chair in the closed position. Thus the electric timer 95 continuously records the total time of chair use from the time the foot rests are inserted in their sockets until the chair is again latched in the closed position.

When the customer sits in the chair, the normally closed seat switch 76 is opened to deenergize the pump motor until the seat is again vacated. At the same time the normally open seat switch 75 is closed to energize double pole double throw relay coil 182 and move switch arms 206 and 218 to the dotted line position to preset the operation of the electric overtime timer when the timer hand 179 passes beyond the adjustable 5–30 minute interval and again makes contact with the contact strip 180 to energize the overtime timer 96 through lines 210, 219, micro-switch 89, lines 220, 222, switch arm 218, line 221, contact 190, timer hand 179 and line 208 to lines 155 and 190. The overtime timer, when thus energized, continues to run until the seat back is lowered to cause striker arm 88 to open the micro-switch 89. Should the customer leave the chair seat and the seat not be closed due to interference by the chair operator by deliberately holding the seat back up, the overtime timer will continue to record this interference time because the switch 89 will remain closed and the relay 181 will be deenergized by the opening of seat switch 75, so that the overtime or interference timer circuit is then traced from line 155 through lines 210, 219, closed switch 89, lines 220, 222, 203, normally closed seat switches 78, 77, 74, line 204, switch arm 206, contact 207, arcuate contact 180, timer hand 179, line 208 to line 190. If the step switch 60 is not allowed to open, the timer 175 continues to run and the interference is recorded as overtime, but if the step switch 60 is released and the seat back 13 is improperly held open, the timer hand 179 returns to zero and the interference time is re-

corded through the circuit as before described.

As previously described, after the customer has left the seat, the seat switches revert to their normal positions shown on the drawings, the relay switch 101 is deenergized, and the pump motor 101 is again energized. It should be pointed out that so long as the step switch 60 is closed, the "up" solenoid 125 is energized. Therefore, if the "down" solenoid is energized because of closure of seat switches 78, 77 and 74 and overtime contact is still established through the master control timer 175, with the step switch 60 still closed, the hydraulic valve 115 will not be reversed because the energies of both solenoids 125 and 126 will be balanced against each other.

After the step switch 60 is opened when the customer leaves the step, the "up" solenoid 125 is deenergized, the master clock timer hand 179 returns to zero start, and the "down" solenoid 126 is energized to move the reversing valve and supply fluid pressure to the hydraulic cylinder in a manner to lower the seat back 13 to the normal position overlying the seat. When the seat back reaches its latching position, the latch switch 99 is thrown to the solid line position disconnecting line 190 from line 156 and therefore deenergizing the pump motor 101, the latch release solenoid 92, the reversing valve "down" solenoid, the chair use timer 95, and the lights 199 and 200.

In view of the novel features of the automatic coin controlled chair described above, an operator of a shoe shining establishment equipped with such chairs is assured of an honest revenue in his absence, because the chair of this invention has been provided with coin controlled features which authorize the use of the chair for a determined period of time beyond which a record of overtime or chair interference time is kept. A timer for recording the total time of chair use has also been provided and by subtracting the amount of recorded overtime from the recorded time of chair use and dividing the resultant figure by the number of times the chair is opened as indicated by the mechanical cycle register, the average shoe shining time may be ascertained so as to indicate the efficiency of the shoe shine boy. Also the use of the timers and register provides a check on the amount of coins in the coin box and the recorded overtime or interference time may be charged against the shoe shine boy. Thus the use of the novel coin controlled chair of this invention assures an efficient operation of a shoe shining establishment without constant personal supervision.

It should be understood that the novel coin controlled chair operating and register circuit of this invention is not limited to the exact chair arrangement which has been specifically described. For example, counterbalance mechanisms, or electrical gearing may be used in place of the hydraulic cylinder for raising and lowering the chair back. Alternative circuit arrangements and other variations which attain a chair control arrangement within the objects of the invention may also be used without departing from the spirit and scope of the invention as defined in the following claims.

We claim:

1. In a coin controlled chair, the combination of a seat, movable means normally in a position to prevent access to said seat, coin responsive means to move said movable means to a position to permit access to said seat for an authorized predetermined period of time, and means to record the period of time of access to said seat beyond the authorized period of time and means for stopping the operation of said last-named means when said movable means is returned to the normal position.

2. In a coin controlled chair, the combination of a seat, movable means normally in a position to prevent access to said seat, coin responsive means to move said movable means to a position to permit access to said seat for an authorized predetermined period of time, means to count and register each operation of said coin responsive means to permit access to the seat, and means to record the period of time of access to said seat beyond the authorized period of time and means for stopping the operation of said last-named means when said movable means is returned to the normal position.

3. In a coin controlled chair, the combination of a seat, movable means normally in a position to prevent access to said seat, coin responsive means to move said movable means to a position to permit access to said seat for an authorized predetermined period of time, means to record the period of time of actual use of said chair from the time the seat is used for the purpose intended until said movable means is returned to the normal position, and means to record the period of time of access to said seat beyond the authorized period of time and means for stopping the operation of said two time recording means when said movable means is returned to the normal position.

4. In a coin controlled chair, the combination of a seat, movable means normally in a position to prevent access to said seat, coin responsive means to move said movable means to a position to permit access to said seat for an authorized predetermined period of time, means to count and register each operation of said coin responsive means to permit access to the seat, means to record the period of time of actual use of said chair from the time the seat is used for the purpose intended until said movable means is returned to the normal position, and means to record the period of time of access to said seat beyond the authorized period of time and means for stopping the operation of said two time recording means when said movable means is returned to the normal position.

5. In a coin controlled chair, the combination of a seat, a pivoted seat back movable from a normal seat access blocking position overlying said seat to a position permitting access to said seat, power means to move said seat back to and from said normal position, an electric control circuit for said power means, said control circuit including coin responsive means to actuate said power means and move said seat back from said normal position for an authorized predetermined period of time, a master control clock timer switch adapted to be energized simultaneously with said actuating means, an overtime recorder, said master control clock timer switch having contacts adapted to be closed after an authorized period of time of access to said seat and to establish a circuit for energizing said overtime recorder, and means to interrupt said last named circuit when said seat back is returned to the normal position.

6. In a coin controlled chair, the combination of a seat, a pivoted seat back movable from a normal seat access blocking position overlying said seat to a position permitting access to said seat, power means to move said seat back to and

from said normal position, an electric control circuit for said power means, said control circuit including coin responsive means to actuate said power means and move said seat back from said normal position for an authorized predetermined period of time, means to count and register each actuation of said coin responsive means, a master control clock timer switch adapted to be energized simultaneously with said actuating means, an overtime recorder, said master control clock timer switch having contacts adapted to be closed after an authorized period of time of access to said seat to establish a circuit for energizing said overtime recorder, and means to interrupt said last named circuit when said seat back is returned to the normal position.

7. In a coin controlled chair, the combination of a seat, a pivoted seat back movable from a normal seat access locking position overlying said seat to a position permitting access to said seat, power means to move said seat back to and from said normal position, an electric control circuit for said power means, said control circuit including coin responsive means to actuate said power means and move said seat back from said normal position for an authorized predetermined period of time, a master control clock timer switch adapted to be energized simultaneously with said actuating means, an overtime recorder, a chair use timer, said master control clock timer switch having contacts adapted to be closed after an authorized period of time of access to said seat to establish a circuit for energizing said overtime recorder, electric switch means responsive to the weight of the chair occupant to establish a circuit for energizing said chair use time recorder, and means to interrupt said two last named circuits when said seat back is returned to the normal position.

8. In a coin controlled chair, the combination of a seat, a pivoted seat back movable from a normal seat access blocking position overlying said seat to a position permitting access to said seat, power means to move said seat back to and from said normal position, an electric control circuit for said power means, said control circuit including coin responsive means to actuate said power means and move said seat back from said normal position for an authorized predetermined period of time, means to count and register each actuation of said coin responsive means, a master control clock timer switch adapted to be energized simultaneously with said actuating means, an overtime recorder, a chair use timer, said master control clock timer switch having contacts adapted to be closed after an authorized period of time of access to said seat to establish a circuit for energizing said overtime recorder, electric switch means responsive to the weight of the chair occupant establish a circuit for energizing said chair use time recorder, and means to interrupt said two last named circuits when said seat back is returned to the normal position.

9. In a coin controlled chair, the combination of a seat, a pivoted seat back movable from a normal seat access blocking position overlying said seat to a position permitting access to said seat, power means to move said seat back to and from said normal position, an electric control circuit for said power means, said control circuit including coin responsive means to actuate said power means and move said seat back from said normal position for an authorized predetermined period of time, a master control clock timer switch adapted to be energized simultaneously with said actuating means, an overtime recorder, said master control clock timer switch having contacts adapted to be closed after an authorized period of time of access to said seat to establish a circuit for energizing said overtime recorder, electric switch means responsive to the weight of the chair occupant for actuating said power means to move said seat back to said normal position after the occupant has left the chair, and means to interrupt said last named circuit when said seat back has returned to the normal position.

10. In a coin controlled chair, the combination of a seat, a pivoted seat back movable from a normal seat access blocking position overlying said seat to a position permitting access to said seat, power means to move said seat back to and from said normal position, an electric control circuit for said power means, said control circuit including coin responsive means to actuate said power means to move said seat back from said normal position for an authorized predetermined period of time, means to count and register each actuation of said coin responsive means, a master control clock timer switch adapted to be energized simultaneously with said actuating means, an overtime recorder, said master control clock timer switch having contacts adapted to be closed after an authorized period of time of access to said seat to establish a circuit for energizing said overtime recorder, electric switch means responsive to the weight of the chair occupant for actuating said power means to move said seat back to said normal position after the occupant has left the chair, and means to interrupt said last named circuit when said seat back has returned to the normal position.

11. In a coin controlled chair, the combination of a seat, a pivoted seat back movable from a normal seat access blocking position overlying said seat to a position permitting access to said seat, power means to move said seat back to and from said normal position, an electric control circuit for said power means, said control circuit including coin responsive means to actuate said power means to move said seat back from said normal position for an authorized predetermined period of time, a master control clock timer switch adapted to be energized simultaneously with said actuating means, an overtime recorder, a chair use timer, said master control clock timer switch having contacts adapted to be closed after an authorized period of time of access to said seat and to establish a circuit for energizing said overtime recorder, electric switch means responsive to the weight of the chair occupant for actuating said power means to move said seat back to said normal position after the occupant has left the chair, electric switch means responsive to the weight of the chair occupant to establish a circuit for energizing said chair use time recorder, and means to interrupt said two last named circuits when said seat back has returned to its normal position.

12. In a coin controlled chair, the combination of a seat, a pivoted seat back movable from a normal seat access blocking position overlying said seat to a position permitting access to said seat, power means to move said seat back to and from said normal position, an electric control circuit for said power means, said control circuit including coin responsive means to actuate said power means and move said seat back from said normal position for an authorized

predetermined period of time, means to count and register each actuation of said coin responsive means, a master control clock timer switch adapted to be energized simultaneously with said actuating means, an overtime recorder, a chair use time recorder, said master control clock timer switch having contacts adapted to be closed after an authorized period of time for access to said seat and to establish a circuit of energizing said overtime recorder, electric switch means responsive to the weight of the chair occupant for actuating said moving means to move said seat back to said normal position after the occupant has left the chair, electric switch means responsive to the weight of the chair occupant to establish a circuit for energizing said chair use time recorder, and means to interrupt said two last named circuits when said seat back has returned to its normal position.

13. In a coin controlled chair, the combination of a seat, a pivoted seat back movable from a normal seat access blocking position overlying said seat to a position permitting access to said seat, a hydraulic cylinder connected to said seat back for moving said seat back to and from said normal position, a source of fluid pressure for operating said cylinder and including a pump and an electric pump motor, a hydraulic reversing valve having two positions corresponding to the two positions of the back for controlling the supply of fluid pressure from said source to said cylinder to cause movement of said seat back between said seat back positions, electromagnetic means controlling said reversing valve, an electric control circuit for said electromagnetic means, said control circuit having coin responsive switch means to energize said electromagnetic means to move said valve to a position for supplying fluid pressure to said hydraulic cylinder so as to move said seat back from the normal position, said coin responsive switch means also being effective to energize said motor, an overtime timer, a master control clock timer having contacts automatically closed after an authorized period of time to energize said overtime timer, switch means adapted to be closed by the weight of a person using the chair to energize said master control timer, said last named switch means also including switch contacts to vary the energization of said electromagnetic means after the chair has been vacated so as to initiate return of the back to its normal position, and switch means responsive to return of the seat back to the normal position to deenergize said electric control circuit.

14. In a coin controlled chair, the combination of a seat, a pivoted seat back movable from a normal seat access blocking position overlying said seat to a position permitting access to said seat, latching means including a normally deenergized latching solenoid normally latching said seat back in said normal position, a hydraulic cylinder connected to said seat back for moving said seat back to and from said normal position, a source of fluid pressure for operating said cylinder and including a pump and an electric pump motor, a hydraulic reversing valve having two positions corresponding to the two positions of the back for controlling the supply of fluid pressure from said source to said cylinder to cause movement of said seat back to either of said seat back positions, a pair of electric solenoids adapted to be selectively energized to move said reversing valve to either of said positions, an electric control circuit for said solenoids, said control circuit having coin responsive switch means to energize one of said solenoids and move said valve to a position for supplying fluid pressure to said hydraulic cylinder so as to move said seat back from the normal position, said coin responsive switch means also being effective to energize said motor and said latching solenoid to move said latching means to unlatching position, an overtime timer, a master control clock timer having contacts automatically closed after a predetermined period of time to energize said overtime timer, switch means adapted to be closed by the weight of a person using the chair to energize said master control timer, said last named switch means also including switch contacts to vary the energization of the other of said solenoids after the chair has been vacated so as to initiate return of the back to its normal position, and switch means responsive to the return of the seat back to the normal position to deenergize said solenoid electric control circuit.

15. In a coin controlled chair, the combination of a seat, a pivoted seat back movable from a normal seat access blocking position overlying said seat to a position permitting access to said seat, latching means including a normally deenergized latching solenoid normally latching said seat back in said normal position, a hydraulic cylinder connected to said seat back for moving said seat back to and from said normal position, a source of fluid pressure for operating said cylinder and including a pump and an electric pump motor, a hydraulic reversing valve having two positions corresponding to the two positions of the back for controlling the supply of fluid pressure from said source to said cylinder to cause movement of said seat back to either of said seat back positions, a pair of electric solenoids adapted to be selectively energized to move said reversing valve to either of said positions, an electric control circuit for said solenoids, said control circuit having coin responsive switch means to energize one of said solenoids and move said valve to a position for supplying fluid pressure to said hydraulic cylinder so as to move said seat back from the normal position, said coin responsive switch means also being effective to energize said motor and said latching solenoid to move said latching means to unlatching position, an overtime timer, a register associated with said latching means to record each energization of said latching solenoid, a master control clock timer having contacts automatically closed after an authorized period of time to energize said overtime timer, switch means adapted to be closed by the weight of a person using the chair to energize said master control timer, said last named switch means also including switch contacts to vary the energization of the other of said solenoids after the chair has been vacated, so as to initiate return of the back to its normal position, and switch means responsive to the return of the seat back to the normal position to deenergize said electric control circuit.

16. In a coin controlled chair, the combination of a seat, a pivoted seat back movable from a normal seat access blocking position overlying said seat to a position permitting access to said seat, a hydraulic cylinder connected to said seat back for moving said seat back to and from said normal position, a source of fluid pressure for operating said cylinder and including a pump and an electric pump motor, a hydraulic reversing valve having two positions corresponding to the two positions of the back for controlling the sup-

ply of fluid pressure from said source to said cylinder to cause movement of said seat back to either of said seat back positions, a pair of electric solenoids adapted to be selectively energized to move said reversing valve to either of said positions, an electric control circuit for said solenoid, said control circuit having coin responsive switch means to energize one of said solenoids and move said valve to a position for supplying fluid pressure to said hydraulic cylinder so as to move said seat back from the normal position, said coin responsive switch means also being effective to energize said motor, an overtime timer, a master control clock timer having contacts automatically closed after a predetermined period of time to energize said overtime timer, switch means adapted to be closed by the weight of a person using the chair to energize said master control timer, a chair use timer adapted to be energized through said last named switch means, said last named switch means also including switch contacts to vary the energization of the other of said solenoids after the chair has been vacated to initiate return of the back to its normal position, and switch means operable in response to return of the seat back to the normal position to deenergize said electric control circuit.

17. In a coin controlled chair, the combination of a seat, a pivoted seat back movable from a normal seat access blocking position overlying said seat to a position permitting access to said seat, latching means including a normally deenergized latching solenoid normally latching said seat back in said normal position, a hydraulic cylinder connected to said seat back for moving said seat back to and from said normal position, a source of fluid pressure for operating said cylinder and including a pump and an electric pump motor, a hydraulic reversing valve having two positions corresponding to the two positions of the back for controlling the supply of fluid pressure from said source to said cylinder to cause movement of said seat back to either of said seat back positions, a pair of electric solenoids adapted to be selectively energized to move said reversing valve to either of said positions, an electric control circuit for said solenoids, said control circuit having coin responsive switch means to energize one of said solenoids and move said valve to a position for supplying fluid pressure to said hydraulic cylinder so as to move said seat back from the normal position, said coin responsive switch means also being effective to energize said motor and said latching solenoid, to move said latching means to unlatching position, an overtime timer, a master control clock timer having contacts automatically closed after a predetermined period of time to energize said overtime timer, switch means adapted to be closed by the weight of a person using the chair to energize said master control timer, a chair use timer adapted to be energized through said last named switch means, said last named switch means also including switch contacts to preset the energization of the other of said solenoids after the chair has been vacated to initiate movement of the back to its normal position, and switch means responsive to the return of the seat back to the normal position to deenergize said electric control circuit.

18. In a coin controlled chair, the combination of a seat, a pivoted seat back movable from a normal seat access blocking position overlying said seat to a position permitting access to said seat, latching means including a normally deenergized latching solenoid normally latching said seat back in said normal position, a hydraulic cylinder connected to said seat back for moving said seat back to and from said normal position, a source of fluid pressure for operating said cylinder and including a pump and an electric pump motor, a hydraulic reversing valve having two positions corresponding to the two positions of said back for controlling the supply of fluid pressure from said source to said cylinder to cause movement of said seat back to either of said seat back positions, a pair of electric solenoids adapted to be selectively energized to move said reversing valve to either of said positions, an electric control circuit for said solenoids, said control circuit having coin responsive switch means to energize one of said solenoids and move said valve to a position for supplying fluid pressure to said hydraulic cylinder so as to move said seat back from its normal position, said coin responsive switch means also being effective to energize said motor and said latching solenoid to release said seat for movement from its normal position, a register associated with said latching means to record each energization of said latching solenoid, an overtime timer, a master control clock timer having contacts automatically closed after a predetermined period of time to energize said overtime timer, switch means adapted to be closed by the weight of a person using the chair to energize said master control timer, a chair use timer adapted to be energized through said last named switch means, said last named switch means also including switch contacts to preset the energization of the other of said solenoids after the chair has been vacated, to initiate return of the back to its normal position, and switch means responsive to the return of the seat back to the normal position to deenergize said electric control circuit.

19. A coin controlled chair of the type having a movable chair member normally in a position to prevent access to said chair, comprising in combination, a seat mounting step, coin responsive means to move said chair member from the normal position and permit access to the chair, a master control clock timer normally non-operative and having overtime switch contacts arranged to be closed after a predetermined period of operation of the timer, step switch means responsive to the weight of a person on said step to render said clock timer operative, an overtime timer energizable upon closure of said overtime switch contacts, a holding circuit for said overtime timer, means controlled by said step switch means for initiating the return of said member to the normal position after the weight of the person is removed, and means responsive to the return of said chair member to the normal position to deenergize said holding circuit.

20. A coin controlled chair of the type having a movable chair member normally in a position to prevent access to said chair, comprising in combination, a latch member adapted to latch said chair member in said normal position, a seat mounting step, coin responsive means to unlatch said latch member and move said chair member from the normal position so as to permit access to the chair, a master control clock timer normally non-operative and having overtime switch contacts arranged to be closed after a predetermined period of operation of said timer, step switch means responsive to the weight of a person on said step to render said clock timer operative, an overtime timer energizable upon closure of said overtime switch contacts.

a holding circuit for said overtime timer, means controlled by said step switch means for initiating the return of said member to the normal position after the weight of the person is removed, and means responsive to the return of said chair member to the normal position to deenergize said holding circuit and latch said chair member in the normal position.

21. The arrangement as set forth in claim 20, and register means operable each time said latch member is unlatched.

22. A coin controlled shoe shine chair of the type having a movable chair member normally in a position to prevent access to said chair, comprising in combination, a seat mounting step, a pair of removable foot rests mountable on the chair, coin responsive means to move said chair member from the normal position to permit access to the chair, a master control clock timer normally non-operative and having overtime switch contacts arranged to be closed after operation of said timer for a predetermined period of time, step switch means responsive to the weight of a person on said step to energize said clock timer, an overtime timer energized upon closure of said overtime switch contacts, a holding circuit for said overtime timer, means controlled by said step switch means to initiate the return of said member to the normal position after the weight of the person is removed, a chair use timer, switch means in series with said step switch and operable by said pair of foot rests to energize said chair use timer when said foot rests are mounted on the chair, a holding circuit for said chair use timer, and means responsive to the return of said chair member to the normal position to deenergize both of said holding circuits.

23. A coin controlled shoe shine chair of the type having a chair member normally in a position to prevent access to said chair, comprising in combination, a latch member adapted to latch said chair member in said normal position, a seat mounting step, a pair of removable foot rests mountable on the chair, coin responsive means to unlatch said latch member and to move said chair member from the normal position to permit access to the chair, a master control clock timer normally non-operative and having overtime switch contacts arranged to be closed after a predetermined period of operation of said timer, step switch means responsive to the weight of a person on said step to energize said clock timer, an overtime timer energizable upon closure of said overtime switch contacts, a holding circuit for said overtime timer, means controlled by said step switch means to initiate the return of said member to the normal position after the weight of the person is removed, a chair use timer, switch means in series with said step switch and operable by said pair of foot rests to energize said chair use timer when said foot rests are mounted on the chair, a holding circuit for said chair use timer, and means responsive to the return of said chair member to the normal position to deenergize both of said holding circuits and latch said chair member in the normal position.

24. A coin controlled shoe shine chair of the type having a chair member normally in a position to prevent access to said chair, comprising in combination, a latch member adapted to latch said chair member in said normal position, a seat mounting step, a pair of removable foot rests mountable on the chair, coin responsive means to unlatch said latch member and move said chair member from the normal position to permit access to the chair, register means energized each time said latch member is unlatched, a master control clock timer normally non-operative and having overtime switch contacts automatically closed after operation of said timer for a predetermined period of time, step switch means responsive to the weight of a person on said step to energize said clock timer, an overtime timer energizable upon closure of said overtime switch contacts, a holding circuit for said overtime timer, means controlled by said step switch means to initiate the return of said member to the normal position after the weight of the person is removed, a chair use timer, switch means in series with said step switch and operable by said pair of foot rests to energize said chair use timer when said foot rests are mounted on the chair, a holding circuit for said chair use timer, and means responsive to the return of said chair member to the normal position to deenergize both of said holding circuits and latch said chair member in the normal position.

25. A chair comprising a seat, an access controlling member for the seat, mechanism mounting said member for movement between a closed position preventing access to said seat and an open position permitting access to the seat, fluid operated means for moving said member between said positions, electrically operated means for controlling said fluid operated means, a circuit controlling said electrically operated means, means for latching said access controlling member in closed position, coin controlled means for disabling said latching means and for initiating operation of said electrically operated means to move said member to open position, switch means in said circuit and operable by disabling of said latching means for maintaining said electrically operated means in operation until said member reaches open position, and switch means in said circuit and positioned in portions of said chair for operation by the weight of an occupant seated in the chair to deenergize said electrically operated means when an occupant is seated in the chair.

26. A chair as set forth in claim 25, said switch means being operable when the customer leaves the chair for reenergizing said electrically operating means, and means controlled by said switch means for directing fluid to said fluid operating means to initiate return of said access controlling member to closed position.

JEFFERSON D. FOWLER.
RALPH A. VAUGHN.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
312,176	Allen	Feb. 10, 1885
1,301,218	Beasley	Apr. 22, 1919
1,741,622	Grafani et al.	Dec. 31, 1929
1,846,352	Ohmer et al.	Feb. 23, 1932
1,903,579	Taylor	Apr. 11, 1933
2,015,607	Shinn	Sept. 24, 1935
2,088,683	Babson	Aug. 3, 1937
2,095,114	Wood et al.	Oct. 5, 1937
2,211,453	Buttikofer	Aug. 13, 1940
2,263,784	Peterson	Nov. 25, 1941
2,379,385	Styers	June 26, 1945
2,440,231	Davidson	Apr. 20, 1948
2,517,048	Stacy et al.	Aug. 1, 1950
2,564,762	Howard et al.	Aug. 21, 1951