(No Model.) 3 Sheets—Sheet 1.

T. I. KNIGHT.

OPERA CHAIR.

No. 324,561. Patented Aug. 18, 1885.

Fig. 1.

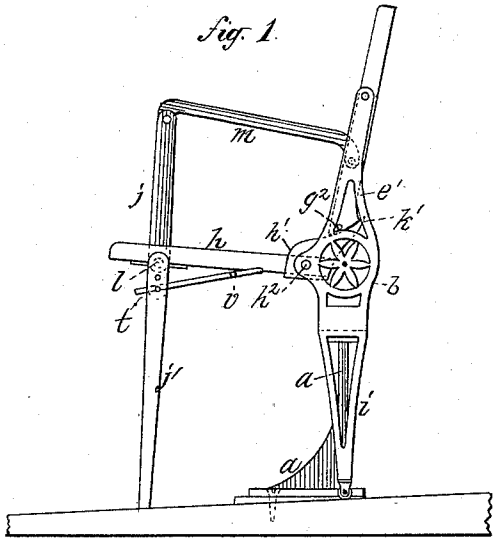


Fig. 2.

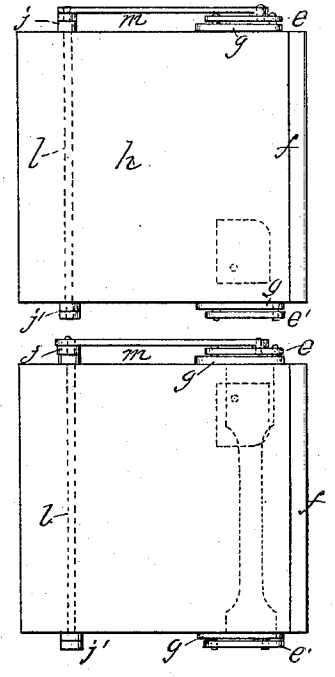
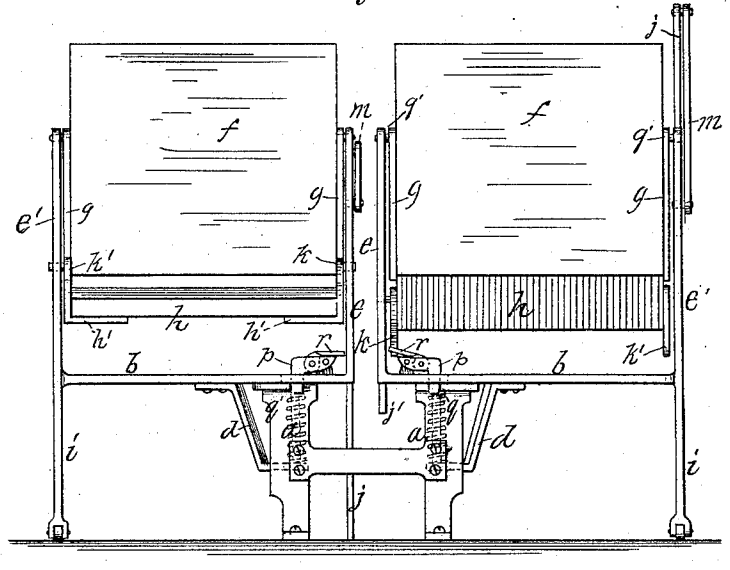


Fig. 3.



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Fig. 4.

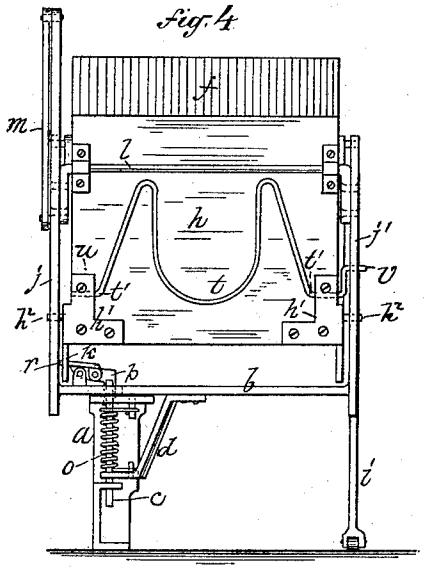


Fig. 5.

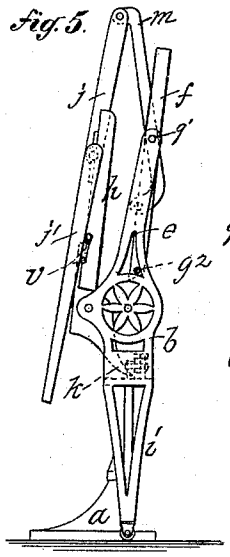


Fig. 6.

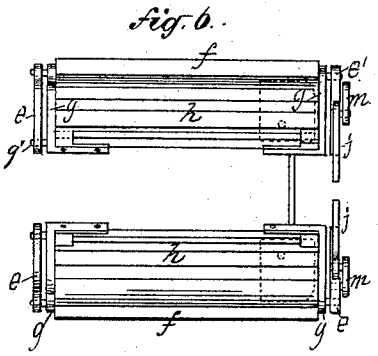
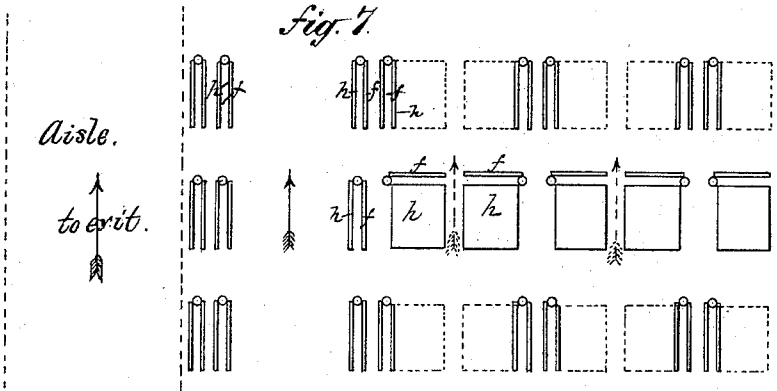


Fig. 7.



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Fig. 8.

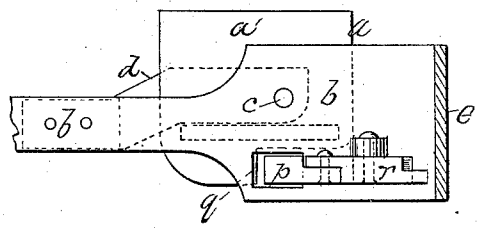


Fig. 10.

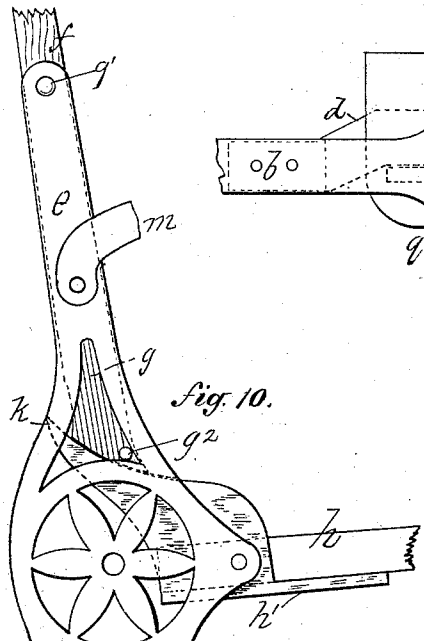
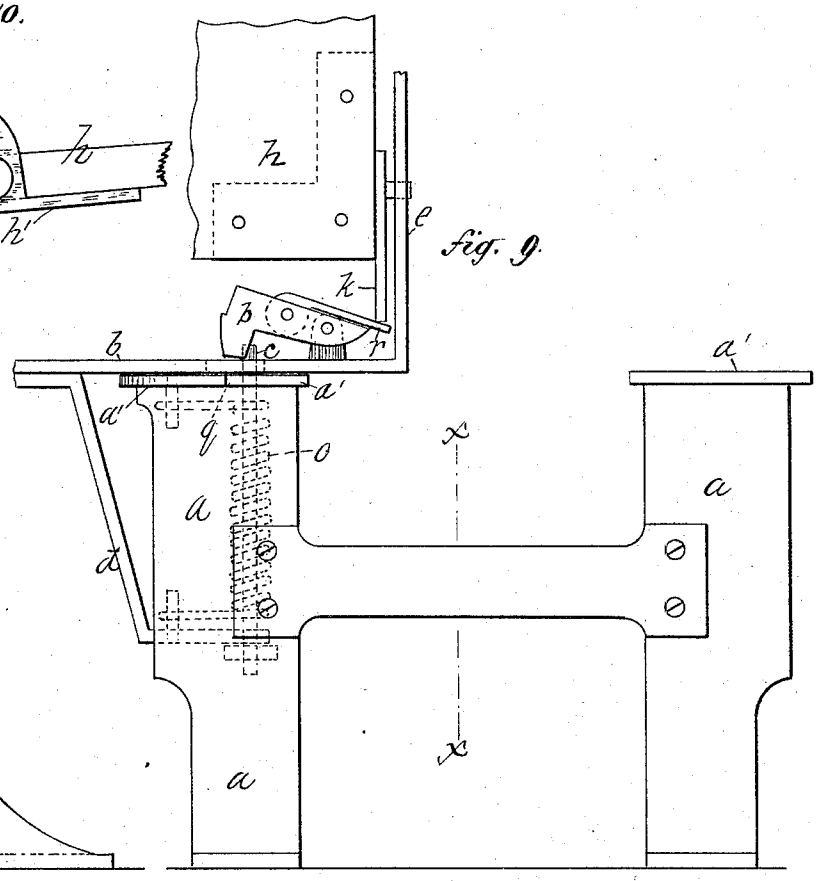


Fig. 9.



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UNITED STATES PATENT OFFICE.

THOMAS I. KNIGHT, OF NEW YORK, N. Y.

OPERA-CHAIR.

SPECIFICATION forming part of Letters Patent No. 324,561, dated August 18, 1885.

Application filed March 15, 1884. (No model.)

To all whom it may concern:

Be it known that I, THOMAS I. KNIGHT, of New York city, New York, have invented certain new and useful Improvements in Opera-Chairs, of which the following is a specification.

My invention relates to that class of folding theater-chairs which are pivoted on one corner on a vertical axis, so as to swing around when folded up and form aisles or passages leading to the exits of the theater. Heretofore chairs of this class have been arranged to swing outward toward the exit into the space of the adjacent row of chairs, whereas in my improvement the chairs swing inward into the space of their own row, whereby desirable advantages are secured. In my improvement I also use an improved form of catch, which locks the seat in its outswung position, and which catch is operated automatically by the folding and unfolding movements of the seat. The back is pivoted; but its pivotal motion is limited by stops, and the seat is engaged with the back when unfolded into position for sitting, so as to hold said back at the correct angle. A hat-rack is employed beneath the seat, which is so connected with one of the folding legs of the chair as to fold or press said rack close up under the seat when the seat is raised, and to allow said rack to assume a receiving position when the seat is depressed. My invention, therefore, consists mainly in the features above outlined, whereby a simple and efficient theater-chair having several points of novel advantage is obtained, as hereinafter fully set forth.

In the drawings annexed, Figure 1 presents a side elevation of my improved chair, shown unfolded into its sitting position. Fig. 2 is a plan view of a pair of chairs in said position, and Fig. 3 is a rear elevation of the same pair of chairs. Fig. 4 is a front elevation of the chair folded. Fig. 5 is an end elevation thereof. Fig. 6 is a plan view of a pair of chairs when folded and swung into their contracted positions to form the passage-ways. Fig. 7 is a diagram, showing several rows of my improved chairs, to illustrate the direction into which they swing to form aisles leading to the exit. Fig. 8 is a fragmentary plan view at the pivotal corner of the chair, illustrating the locking-catch; and Fig. 9 is a rear elevation of the same part, illustrating the catch and the supporting standard or pedestal. Fig. 10 is a sectional side elevation on line *x x* of Fig. 9.

Referring first to Figs. 3, 8, and 9, *a* indicates a strong H-shaped standard or pedestal, fixed at the base to the floor of the theater, each branch of the H rising under the adjacent corners of two chairs, and on one of which standards each pair of chairs is supported in such way as to swing toward each other when folded, like the closing of a book, as seen in Fig. 5, and to swing outward like the opening of the lids of the book, as shown in Fig. 6.

b indicates a swinging bracket-arm, which forms the main member of the chair-frame, and which is pivoted at one end, which corresponds to one corner of the chair, on the long axial pin *c*, which is free to turn in bearings on one branch of the H-shaped pedestal *a*, as best shown in Figs. 3, 9, 8, and 7, this axial pin being fixed rigidly at the top in the bracket-arm *b*, as will be understood. An auxiliary brace or bracket, *d*, depends from the main bracket *b*, and its lower end fits around the lower end of the axial pin *c* and rests on the lower bearing of the said pin in the standard *a*, so as to give a more firm support to the main bracket-arm.

From each end of the swinging bracket-arm *b* uprights *e e'* arise, which form the back side bars of the chair, and to the top of which the back *f* of the chair is pivoted or trunnioned on a horizontal axis at about the middle thereof, but a little above its center of gravity, so that when the back is free it will hang vertically, as will be understood. The back *f* is not pivoted directly to the uprights *e e'* of the bracket *b;* but to its edges are fixed metal fittings *g g*, which are formed with short trunnions *g'*, which are pivoted in the upper ends of the uprights *e e'*, as shown, while the lower ends of said fittings *g g* are provided with pins g^2, which project into slots on the side bars, *e e'*, which allow the back to be inclined to a limited extent only.

Now *h* indicates the seat, which is pivoted at the rear corners to pivotal ears projecting forward from the lower end of the side bars *e e'*, just above the main bracket-arm, so that said seat is thus capable, like ordinary folding

seats, of being swung down into a horizontal position for sitting, as shown in Figs. 1, 2, and 3, or of being raised up in a nearly vertical position parallel with the back when the chair is folded out of use, as shown in Fig. 5. The back or pivotal corners of the chair-seat are, of course, properly re-enforced with metal fittings h', on which are formed or received the trunnions or bolts h^2, by which the back is pivoted in the ears of the uprights e e', as shown, and these fittings are provided with backwardly-projecting cam wings or horns, k k', which when the seat is depressed engage with a rounded or cam face on the end of the back-fittings g g, and thus tilt the back f to its proper angle for sitting, and hold it there with the stop-pins g^2 brought to their forward limit, as shown in Fig 1, thus holding the back firmly at the proper angle. Now, the pedestal a being under one corner of the chair, serves, of course, as its main leg or support, and besides this main leg the chair has preferably three other legs, respectively, at the other three corners, although all these legs are not essential.

i indicates the back corner leg, which depends from the outer end of the bracket-arm b in line with the back side bars, e e', and may be a continuation of the back side bar, as will be understood.

j j' indicate the front legs, which are fixed near the front edge of the seat on each side of the ends of a pivoted bar or rock-shaft, l, which is supported in bearings under the seat, as shown well in Fig. 4, also in Figs. 1 and 2; and one of these legs j is prolonged above the rock-shaft and rises above the seat, and is pivoted at the upper end to the front end of the arm-bar m, which is pivoted at the back end to the back side bar, e, as best shown in Figs. 1 and 2. Hence, by this linked or jointed connection of the legs and arms with the seat and back-frame of the chair, it will be seen that when the seat is raised or folded up against the back the legs will also be folded parallel therewith, the arm taking an inclined or diagonal position between them, as shown in Fig. 5, and the whole chair being thus folded into a narrow vertical space, as will be understood. This folding of the legs, arms, and seat of the chair is, of course, common in folding chairs, and I do not claim this feature as novel in itself.

I have shown the chair with one arm on the side, and one front leg prolonged above the rock shaft and seat to connect with the arm; but of course both front legs might be prolonged to connect with arms on each side. In practice, however, only the outside chair of each row—that is, the chair next to the aisle—will need two arms, as last described, each succeeding chair having but one arm, &c., as shown, as the sitters on adjacent chairs may use the one intervening chair-arm jointly, according to the usual arrangement in theater-chairs, as will be understood. Now, when the chair is folded up, as shown in Figs. 4 and 5, it may be swung around on the pivot c, so as to throw the folded chair parallel with the line of its row (see Fig. 6) into the position shown in Fig. 4, in which position the chair will be ready for use when the seat is depressed; or, on the other hand, the folded chair may be swung inward into and across the line of its own row at right angles to its former or sitting position, as shown in Fig. 6, and also in certain parts of the diagram in Fig. 7. Now, upon the pivot-pin c is placed a strong torsional spiral spring, o, one end of which bears upon the pedestal a, while the other end bears upon the brace d of the main arm b, and its tension acts constantly to turn or swing the arm b and the chair thereto connected in a direction at right angles across the line of the row in the position last described, as shown in Fig. 6 and partly in Fig. 7, which position is always the normal position of the chair when folded. Now, each chair of the pair which is pivoted to one pedestal swings around across the line of the row in opposite directions or toward each other, like the closing of the lids of a book, as before described, and shown in Figs. 6 and 7, and hence when the chairs are thus folded and swung together after an audience rises to leave the theater, free aisles or passages will be formed between the folded seats leading to the exits, as illustrated in Fig. 7, thus affording unobstructed lines of exit for the audience in parallel files among the folded seats, as will be readily understood, thereby enabling the theater to be emptied quickly in case of emergency, and thus avoiding the ill results of panics, which is a most important advantage of this construction. Now, a pawl or latch, p, is pivoted on top of the arm b, over the pivotal corner thereof, and when the chair is swung around for the sitting position, as shown in Figs. 3, 4, 7, and 8, the point of this pawl will fall through a slot in the arm b behind a stop shoulder, q, on the seat of the pedestal a, thus positively holding the chair in its outswung position against the tendency of the spring o to swing it inward, as will be understood. Now, upon the main pawl or latch p is pivoted a secondary pawl, r, which rests thereon, with its nose projecting beyond the pivoted end of the main pawl p, as fully shown in Figs. 3, 4, 8, and 9, so that it will be readily seen that the secondary pawl may be lifted up without raising the latch-pawl p; but if the nose of the secondary pawl is depressed it will press upon and thus tilt and lift the latch-pawl p out of engagement with the locking-shoulder q, and thus leave the chair free to be swung around by the action of the spring o, as will be readily comprehended. Now, the pawls are operated, as above indicated, by the movement of the chair-seat, as will now appear. When the chair is folded, as shown in Figs. 4 and 9, the point of one of the cam-horns k on the chair-seat will be under the tip of the secondary pawl r, and hence if the seat is now depressed the horn will move against and lift the pawl

r, which will move freely with the horn without disturbing the locking-latch p, and as soon as the horn passes out of engagement with the pawl r the latter will fall back to its former position on the pawl p, the seat being now depressed ready to be sat upon, and the pawl r still engaged with the shoulder q on the pedestal a to hold the chair in its outswung or sitting position, as shown in Figs. 1, 2, and 3. If, now, the sitter should rise and desire to leave the theater, he will raise the seat to fold the chair, as usual, and this movement will bring the tip of the cam-horn k down on the tip of the pawl r, and thereby tilt both pawls in a direction to raise the nose of the locking-pawl p out of engagement with the locking-shoulder q, (see Figs. 8, 9, and 10,) and as soon as the pawl passes the edge of the shoulder the spring o will at once act to swing the chair around on the pivot c, the nose of the pawl riding on the seat a' until the folded chair is swung into a position at right angles to the row, as shown in Figs. 5 and 6, in which position it will be stopped by the square corner of the brace d fitting against the flat face of the pedestal a, as shown in Fig. 9. It may now be seen that a great advantage results from having the folded chairs swing into and across the space of its own row, for in doing this it occupies no more space transversely in the row than it did when unfolded, but leaves almost its entire longitudinal space free to form the passage to the exit, and in doing this it does not in any way obstruct the knee-space of the next row, as is the case with the outwardly-swinging chairs, and hence does not interfere with the sitters in the next row, as is the case with the outswinging chairs, which cannot be swung out while the seats in the next row are occupied. Hence by my improved arrangement any person in an occupied row of chairs may rise, fold, and swing around his seat without interfering with any other sitter; and when this is done he will have a much freer space to stand in than is now afforded by any other system, and he can readily do this to afford more easy access to any other person who desires to reach an unoccupied seat in the row, and with much greater convenience than is the case with any other system in use, as will be readily appreciated.

It will be readily understood that any other motive device may be employed to give a rotating tendency to the chair in the direction indicated besides the spring o; or, in fact, this spring or its equivalent may be omitted altogether, leaving the chair free to be swung in or out by the action of the operator's hand alone.

Any other equivalent arrangement of catches or pawls besides the parts r p may be used. I prefer, however, the exact devices shown, as they are very simple and efficient.

In addition to the features already described, I prefer to provide the bottom of the chair-seat with a hat-rack, which shall be folded up close to the seat when the seat is raised and the chair folded, and which shall be allowed to drop, as shown in Fig. 1, when the seat is depressed to receive the hat; and this device is best shown in Figs. 1, 4, and 5, to which reference may now be had.

Referring to Fig. 4, t indicates a strong spring-wire bent into a rounded M shape and placed flatwise beneath the seat, the central loop of which is adapted to receive and support the brim of the hat between the wire and the seat, as usual in this class of hat-racks. Each end of this wire is bent at nearly right angles to form trunnions t, which are journaled in grooves on the fittings h' between the fittings and the seat, as shown, so that the M-shaped wire has thus a limited rocking motion therein. Each extremity of the wire terminates beyond the trunnions t' in crank-shaped terminals u v. The terminal u lies in a groove in the fitting h' and presses against the under side of the seat, and forms a spring which, together with the weight of the wire t, tends constantly to keep the wire pressed out from the seat in a position to receive the hat, a position which it will always assume when the seat is depressed, as shown in Fig. 1. The opposite crank, v, projects slightly beyond the edge of the seat and in front of the leg j, so that when the seat is raised to fold up the chair this leg j will press against the crank and thus slightly rotate the trunnioned wire t, so as to press it tightly against the under side of the seat, as shown in Figs. 4 and 5, thereby folding the hat-wire compactly out of the way when the same is not required for use, the advantage of which will be obvious.

I make no claim in this application to the hat-holding device, as it will form the subject-matter of a separate application.

I am aware of the Patents Nos. 57,255, 82,755, 244,191, 283,512, 295,261, and 300,617, and make no claim to anything shown therein.

I am also aware that it has been proposed to pivot two seats to a single support, said chairs being adapted to fold upward toward each other, and do not seek to cover such construction.

What I claim as my invention is—

1. A row of chairs secured to a common support, each chair having a seat folding upward against the back and turning on a vertical axis near one of the rear corners of said seat, and having the axis of the chairs secured in pairs, with the axis of each pair closer together than the nearest axes of two adjoining pairs, and each chair provided with a catch to lock it in its forward position, and a motor to turn the chair around substantially at right angles to its said forward position when the catch is released, whereby a wide alley will be opened between the chairs when the seat is raised, as set forth.

2. The combination, with the double pedestal a, consisting of two sections united by a permanently-fixed brace, of a chair pivoted to each section of said double pedestal by a vertical pivot arranged under each seat, and the

two constructed to fold to and from each other in horizontal planes, substantially as and for the purposes specified.

3. A folding chair having a back frame pivoted at one side by a vertical pivot to a stand beneath the seat, said back being provided with an extension on its opposite side to form a leg for the support of the same, substantially as described.

4. A folding chair having a back frame pivoted at one side by a vertical pivot to a stand beneath the seat, said back frame being provided with an extension on its side opposite the vertical pivot to form a back leg, and front legs pivoted to the seat thereof and folding with said seat, substantially as described.

5. A folding chair pivoted to a support at one corner, a catch to lock the same in one position, and a spring to swing the chair-frame and seat to another position at right angles to its former position, when said catch is unlocked, substantially as described.

6. A folding-chair frame vertically pivoted to a support, a catch to lock the same in one position, a seat pivoted to said frame constructed to unlock the catch when raised, and a spring to change the position of the main frame of the chair when the catch is operated by the seat, substantially as described.

7. The combination, with a pedestal of a chair-frame pivoted thereto, and provided with the slotted main bracket *b*, and the auxiliary brace *d*, the spring-actuated axial pin *c*, the pivoted chair-seat having the fittings K K′, and the pawls *p* and *r*, substantially as specified.

8. The combination, with a double pedestal, of a chair pivoted to each section of said double pedestal, each chair being provided with a pivoted seat and spring-actuated catch mechanisms, substantially as described, for holding the chairs in the folded and open positions, as set forth.

9. The combination, with the pedestal, the chair-supporting frame *b e e′*, pivoted thereon, and the seat *h*, pivoted to said frame, of the rock-shaft *l*, journaled at the front of the pivoted seat, the legs *j j*, fixed to the ends of the rock-shaft, and the arm *m*, pivoted at one end to the supporting-frame, and at the opposite end to the upward prolongation of one of the legs *j*, as set forth.

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