Sept. 4, 1951 R. L. JENSEN 2,567,111

FOLDING ARMCHAIR

Filed April 14, 1948 3 Sheets-Sheet 1

Fig 1.

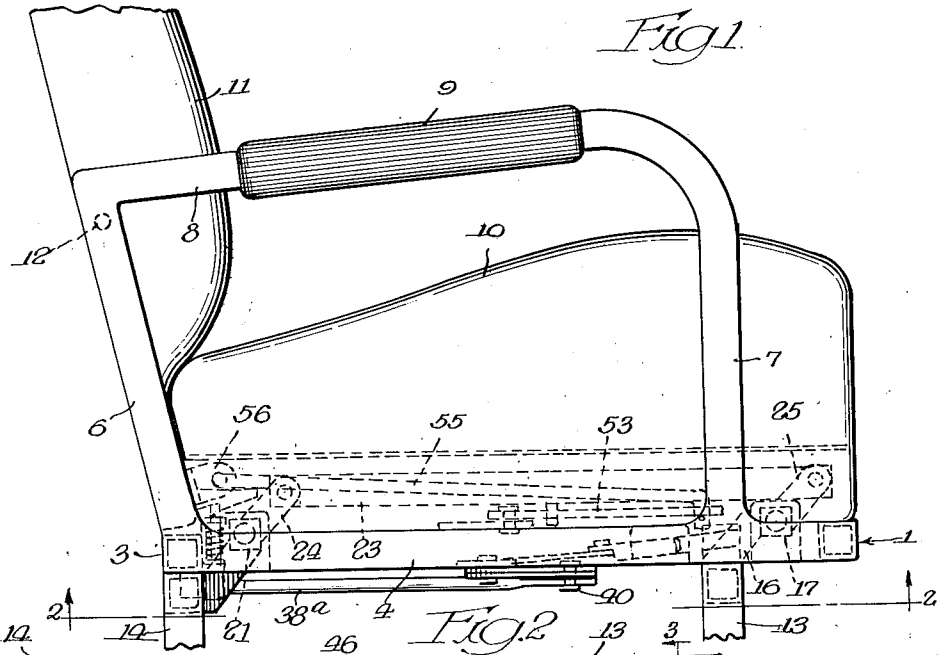


Fig. 2

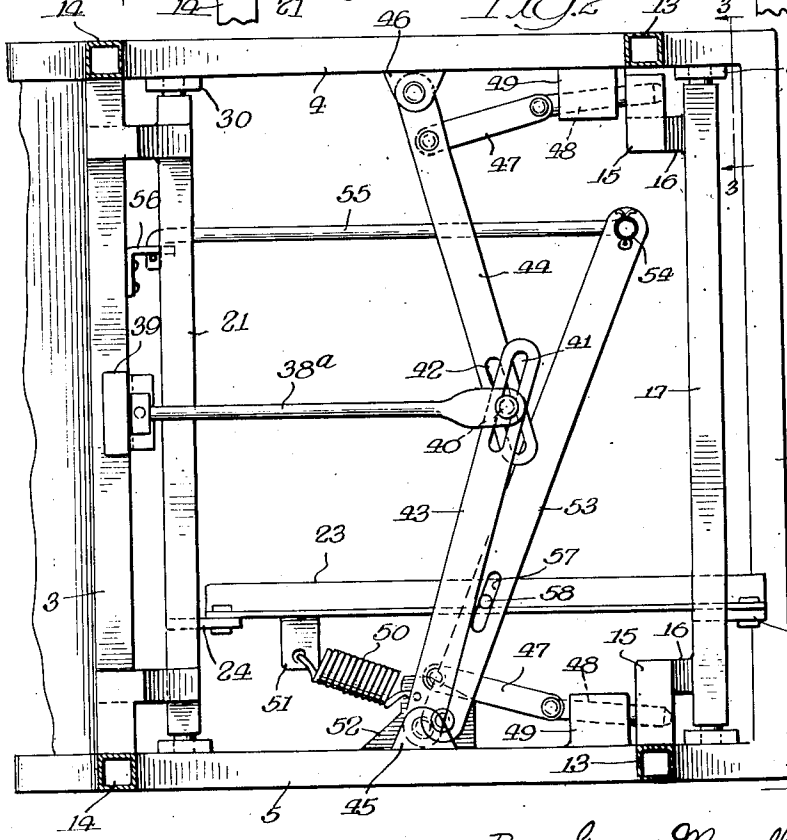
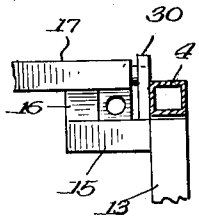


Fig. 3



Inventor
Ralph L. Jensen

By: Spencer, Marzall, Johnston & Cook.
Attys

Sept. 4, 1951 R. L. JENSEN 2,567,111

FOLDING ARMCHAIR

Filed April 14, 1948 3 Sheets-Sheet 2

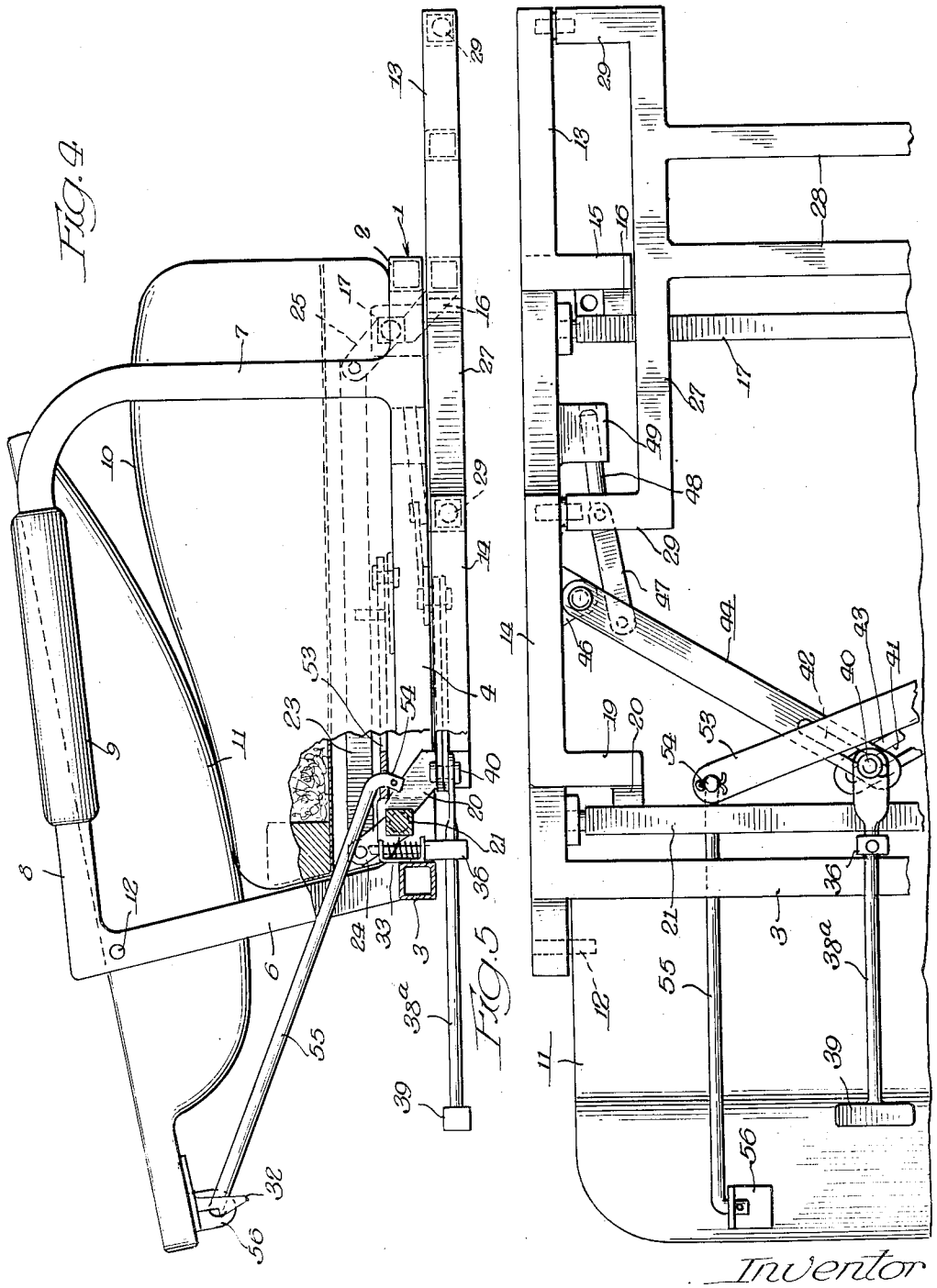


FIG. 4

FIG. 5

Inventor
Ralph L. Jensen
By: Spencer, Marzall, Johnston & Cook
Attys

Sept. 4, 1951 R. L. JENSEN 2,567,111

FOLDING ARMCHAIR

Filed April 14, 1948 3 Sheets-Sheet 3

Fig. 9.

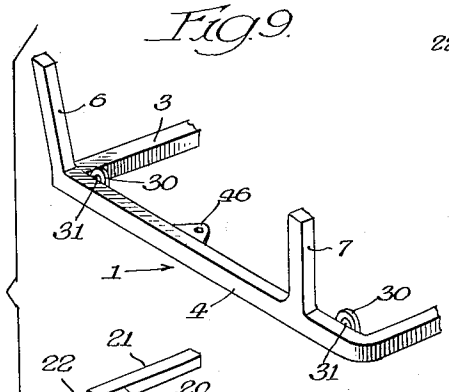
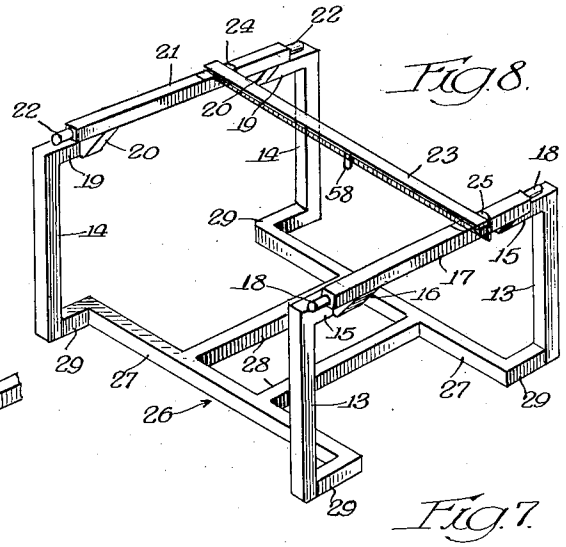


Fig. 8.



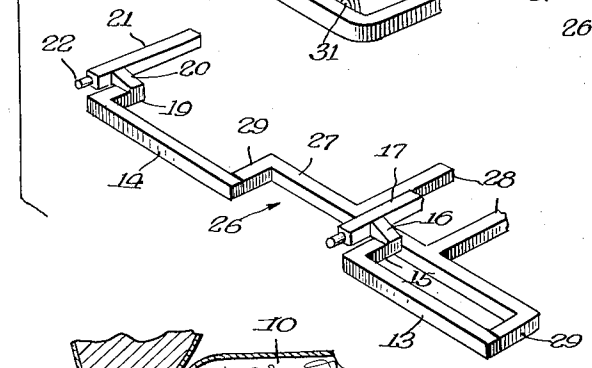


Fig. 7.

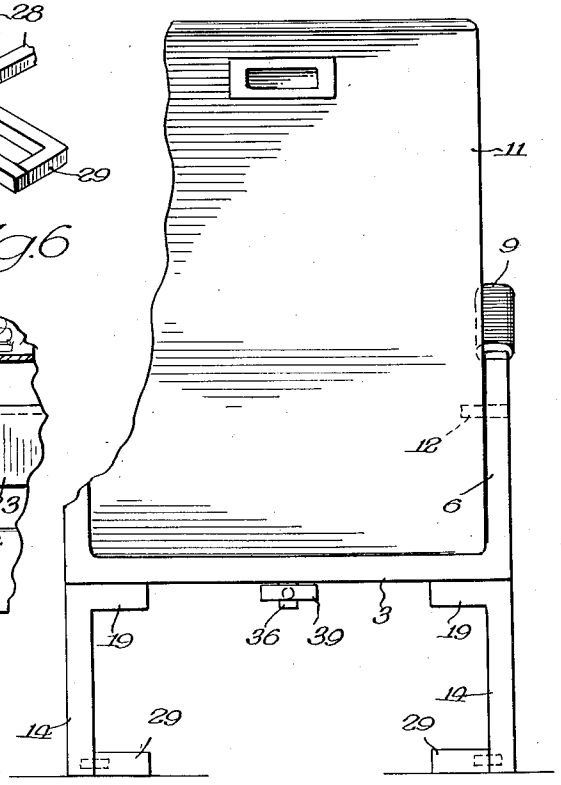
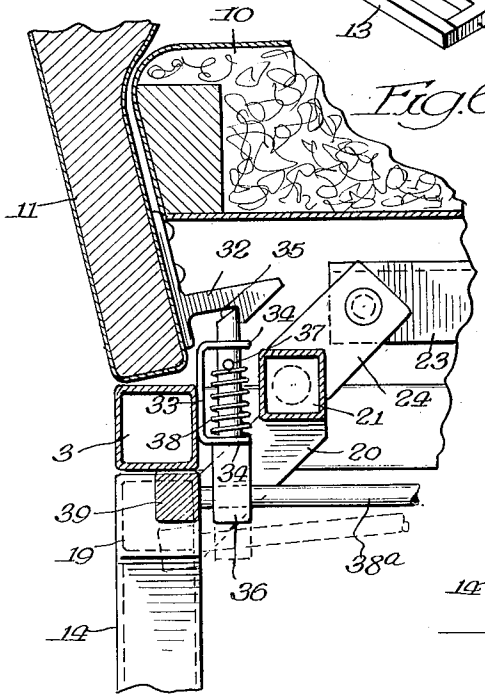


Fig. 6.



Inventor
Ralph L. Jensen
By: Spencer, Marzall, Johnston & Cooke.
Attys

Patented Sept. 4, 1951

2,567,111

UNITED STATES PATENT OFFICE

2,567,111

FOLDING ARMCHAIR

Ralph L. Jensen, Chicago, Ill., assignor to The Warwal Corporation, Chicago, Ill., a corporation of Illinois

Application April 14, 1948, Serial No. 20,960

10 Claims. (Cl. 155—148)

1

This invention relates in general to folding chairs and particularly to folding armchairs and a novel construction of folding mechanism in association therewith.

The chair to which this invention is particularly applicable may be used in any suitable location but is particularly designed for use in the chair cars of railroad passenger trains. These are usually armchairs which have upholstered seats and backs, and it is highly desirable that they be folded so that they may occupy less space, not only while in transit, but also for storage purposes.

An important object of the present invention is to provide a novel form of folding construction for an upholstered type of armchair.

Another object of the invention is to provide a novel leg structure for an armchair which may be easily folded to a collapsed position for storage purposes.

A further object of the invention is to provide a folding armchair wherein the upholstered back thereof may be folded downwardly onto the seat portion at the same time the legs are folded or collapsed, whereby the chair may occupy less space for storage or transit purposes.

Still another object of the invention is to provide a novel form of folding leg structure for chairs wherein the leg structure will be normally located in supporting position, and wherein a release of the locking means will permit the legs to be collapsed.

A still further object of the invention is to provide a novel form of folding armchair wherein the back portion is adapted to be pivotally mounted so that it may be folded downwardly against the seat portion but may be locked in a substantially upright position for use. The folding leg structure is also adapted to be locked in supporting position, but may be released for purposes of collapsing the legs. There is also provided an inter-connection between the locking means for the back and the locking means for the leg structure so that a release of one may also act to release the other.

Still another object of the invention is to provide a novel form of inter-connecting means beween the back and the legs of a folding chair so that when the back is folded downwardly onto the seat, this movement will also cause a folding or collapsing of the leg structure.

Other objects and advantages of the invention will appear more fully hereinafter upon reading the following description taken in conjunction with the accompanying drawings in which:

2

Fig. 1 is a fragmentary side elevational view of a chair in accordance with the present invention.

Fig. 2 is an under plan view of the chair taken along the line 2—2 of Fig. 1.

Fig. 3 is a fragmentary sectional view of a detail taken along the line 3—3 of Fig. 2.

Fig. 4 is a side elevational view of the chair in its folded or collapsed position.

Fig. 5 is a fragmentary under plan view of the chair in its collapsed position as shown in Fig. 4.

Fig. 6 is an enlarged fragmentary vertical sectional view through a detail of construction at the rear of the chair showing the locking and releasing means for the back member.

Fig. 7 is a fragmentary rear elevational view of the chair.

Fig. 8 is a perspective view of the leg structure, and

Fig. 9 is a fragmentary exploded view of the leg structure and the base portion of the chair.

Referring now more particularly to the drawings and especially to Figs. 1 and 2, the chair of the present invention includes a main base or seat supporting part which is generally indicated by the numeral 1. This base portion includes a frame having a front cross member 2, rear cross member 3, and connecting side members 4 and 5. The rear corners of this frame have upwardly extending portions 6. Similar upwardly extending portions 7 are positioned adjacent to front of the frame at each side thereof. These upwardly extending parts 6 and 7 at each side of the chair are connected together by a member 8 which may, if desired, be upholstered or padded as at 9 to thereby provide an arm for the chair.

An upholstered seat portion 10 is adapted to be removably supported by the main frame or base 1 and a back 11 which may also be upholstered, if desired, is mounted for pivotal movement between the arms by means of the pivot pins 12. It will thus be evident that the back 11 may be pivoted about the pins 12 from the substantially upright position thereof shown in Fig. 1 to the collapsed position thereof shown in Fig. 4.

The leg structure which supports the seat and which is adapted to be folded or collapsed is more clearly shown in Fig. 8 and includes the spaced front legs 13 and spaced rear legs 14. The upper ends of the front legs 13 turn inwardly toward each other as shown at 15, and are provided with offset portions or blocks 16 formed integrally therewith or mounted rigidly thereon. A connecting cross member 17 is rigidly secured to the offset blocks 16 to thereby complete the front

leg section. Each end of the cross member 17 is provided with an outwardly extending pivot pin 18 for the purpose of pivotally mounting the frame on the main seat portion as will be more clearly pointed out hereinafter.

The rear leg structure is similar in all respects to that just described with respect to the front leg structure wherein the rear legs 14 have the inwardly extending portion 19 at their upper ends provided with the offset blocks 20. A similar cross member 21 connects these blocks 20 and also has the pivot pins 22 extending outwardly from each end thereof.

A connecting link in the form of an angle member 23 is pivotally secured to the front and rear leg sections by means of an angularly disposed arm 24 at the rear and a similar arm 25 at the front. The arm 24 is secured to the cross member 21 and the arm 25 is secured to the cross member 17. Each arm is pivotally secured to the connecting link or angle member 23. It will therefore be evident that if the connecting member 23 is caused to move longitudinally, it will thereby rotate the two cross members 17 and 21 through an angle of substantially 90°, and will likewise rotate the legs 13 and 14 through a similar angle.

All of the legs are connected together at their lower ends by means of a connecting frame 26. This frame includes side members 27 and connecting braces or cross members 28. The front and rear ends of the side members 27 have short outwardly extending portions 29, each of which is pivotally connected to the bottom of one of the legs. When a longitudinal movement of the member 23 occurs, then the legs will be caused to fold against this supporting base 26.

Each of the sides 4 and 5 of the seat frame has a small ear 30 secured thereto having an opening 31 therein for the purpose of receiving the pivot pins 18 and 22 of the leg structure. The leg structure being thus pivotally mounted to the seat frame will support the seat, and will also permit the leg structure to be folded about the pivot points when the chair is to be collapsed.

The back member 11 is provided with a hook portion 32 at its forward side and near the bottom thereof which acts in conjunction with a locking means for releasably holding the back in a substantially upright position when the chair is in use. This hook member 32 cooperates with a locking means which includes a bracket 33 secured to the rear cross member 3 of the seat frame and intermediate the ends thereof. The upper and lower ends of the bracket 33 have inwardly turned flanges 34 having openings therethrough for the purpose of slidably mounting a rod 35. The bottom 36 of rod 35 is enlarged so as to form a shoulder adapted to come against the under side of the lower flange 34 and thereby limit the upward sliding movement of the rod 35. The rod 35 is provided with a pin 37 located between the two flanges 34 and has a coiled compression spring which surrounds the rod 35 and bears at one end against the pin 37. The other end of the spring 38 bears against the lower flange 34 whereby the rod 35 is normally urged in an upward direction. It will be noted that the upper end of rod 35 is tapered so that when the back 11 is being returned to its upright position after having been folded downwardly, the forward edge of the hook 32 will slide over the end of rod 35 and depress it against the spring which will return the rod to its upper position. After the forward end of the hook has passed the upper end of the rod, this construction will permit the back to be maintained normally in a substantially upright position and will be released, so that the back can be pivoted and folded downwardly against the seat.

The lower enlarged portion 36 of the rod 35 has an opening therethrough to permit the rod 38*a* to be slidably mounted therein. The rear end of rod 38*a* is provided with a handle 39 of any suitable form so that it may be grasped and pulled downwardly. When the rod is thus pulled downwardly, it will lower the rod 35 against the spring 38 and release the back so that it may be folded downwardly against the seat. The foregoing construction is more clearly shown in Fig. 6 of the drawings.

Reference will now be made more particularly to Figs. 2 and 5 where the construction of the various parts below the seat are more clearly shown. It will there be seen that the rod 38*a* extends forwardly for a considerable distance and terminates in a substantially flat portion which has a pivot pin 40 therein. This pivot pin 40 is adapted to traverse slots 41 and 42 located in the ends of links 43 and 44 respectively. The link 43 is pivotally mounted to an inwardly extending ear 45 secured to the side member 5 of the seat frame. The link 44 is similarly pivotally mounted to an ear 46 also secured to the opposite side 4 of the seat frame. It will be evident that when the handle 39 is grasped and moved downwardly to remove the locking means of the back 11, the rod 38*a* may then be moved toward the rear of the chair and rotate the links 43 and 44 about their respective pivotal points, so that these links will move toward the rear of the chair.

Each of the links 43 and 44 has a forwardly extending smaller link 47 pivotally mounted thereon adjacent each side of the seat frame. The forward end of each link 47 pivotally supports a pin 48. Each pin 48 is guided by means of a guide block 49 also mounted on each of the side members 4 and 5 of the seat frame. Each guide member 49 has an opening therethrough in which the pin 48 is adapted to slide. The forward end of each pin 48 is adapted to be received within an opening through a block connected to the part 15 of each of the front legs 13. When the pins 48 are in place as shown in Fig. 2, they act as locking means to prevent the leg structure from being folded or collapsed. Rearward movement of the link 38*a* will retract the pins 48 and remove them from locking position to the released position as shown in Fig. 5. In this position, the leg structure will be free to pivot about the respective pivot points 18 and 22 for the purpose of collapsing the leg structure.

The leg structure is additionally held in its normal supporting position by means of a coiled spring 50. One end of this spring 50 may be secured to a plate 51 secured to the angle member 23, and the other end of the spring may be secured to an inwardly extending plate 52 secured to the side 5 of the seat frame. It was stated above that the rearward longitudinal movement of the angle member or connecting link 23 would rotate the arms 24 and 25 to fold the legs and collapse the chair. This cannot be done as long as the pins 48 are in their locking position shown in Fig. 2. These pins 48 must first be moved to their position shown in Fig. 5. When this occurs, the leg structure will not immediately collapse but will require some force, due to the spring 50 which normally urges the connecting angle 23 in a forward direction.

The structure which actually causes the folding or collapsing of the chair and leg structure includes a link **53** pivotally mounted at one end thereof on the plate **52** and which is provided with a pivot pin **54** at its opposite end. The pivot pin **54** may, if desired, be formed integrally with a rearwardly extending rod **55**. The rear end of rod **55** is turned inwardly and is received within an opening in a bracket **56** mounted near the lower edge of the back **11**. The link **53** has an elongated slot **57** intermediate the ends thereof and adjacent the connecting angle **23**. The angle **23** has an outwardly extending pin **58** which is received within this slot **57**.

The operation of the manner in which the chair is folded, after the various locking means for the back and leg structure have been released, merely consists in folding the back **11** forwardly about its pivotal point **12**. This movement of the back will cause a rearward movement of the link **55** which in turn causes the link **53** to rotate about its pivot. When the link **53** is thus moved rearwardly, the pin and slot connection with the connecting angle **23** will force the angle to be moved rearwardly. When the angle is thus moved rearwardly, the connecting cross pieces **17** and **21** connecting the front and rear legs will be pivoted about their pivotal points **18** and **22** to move the legs **13** and **14** upwardly through an arc of substantially 90°. The chair will thus be moved to its collapsed position as shown in Fig. 4.

It will be evident that this folding of the chair cannot take place until the rod **38***a* has been first moved downwardly to release the back and then to move rearwardly to release the locking pins **48** which hold the legs in supporting position. After this has been done, the back **11** is then pivoted downwardly against the seat, and this movement simultaneously causes a folding of the leg structure. It will also be clear that the connecting link between the back and leg structure will simplify the process of collapsing the chair, which process is thereby performed in one operation instead of several. The leg structure is such that all of the legs are folded at one time, rather than individually, and a single locking structure may be utilized for maintaining all of the legs in their supporting position. It is not necessary for each of the legs to be locked individually. The foregoing construction enables an upholstered armchair to be easily folded into a small and compact space, either for storage or during transportation thereof, and the structure will enable the chair to be set up for use with a minimum of effort and within a short period of time.

Changes may be made in the form, construction, and arrangement of parts from that disclosed herein without in any way departing from the spirit of the invention, or sacrificing any of the attendant advantages thereof, provided, however, that such changes fall within the scope of the claims appended hereto.

The invention is hereby claimed as follows:

1. A folding chair of the class described comprising a seat frame, a back member pivotally mounted on said frame and movable to substantially upright position and to collapsed position, releasable back locking means to lock said back member in upright position, supporting legs pivotally mounted on said frame and movable to collapsed position, leg locking means for releasably locking said legs in supporting position, and common means operable to release said leg and back locking means.

2. A folding chair of the class described comprising a seat frame, a back member pivotally mounted on said frame and movable to substantially upright position and to collapsed position, releasable locking means to lock said back member in upright position, supporting legs pivotally mounted on said frame and movable to collapsed position, means for releasably locking said legs in supporting position, and interconnected means for actuating and releasing both of said locking means.

3. A folding chair of the class described comprising a seat frame, a back member pivotally mounted on said frame and movable to substantially upright position and to collapsed position, a supporting leg framework pivotally mounted on said seat frame and including rotatable bars connected thereto, rotation of said bars adapted to move said leg framework to collapsed position, and means connecting said back member with said bars, whereby movement of said back member to collapsed position will also collapse said leg framework.

4. A folding chair of the class described comprising a seat frame, a back member pivotally mounted on said frame and movable to substantially upright position and to collapsed position, a spring actuated locking means for locking said back member in upright position on the frame, supporting legs pivotally mounted on said frame for movement between extended and collapsed position, leg locking means for releasably securing said legs in extended position, and releasing means operable in one direction to release said spring actuated locking means to permit said back member to be collapsed, said releasing means being also operable in another direction to release said leg locking means.

5. A folding chair of the class described comprising a seat frame, a back member pivotally mounted on said frame and movable to substantially upright position and to collapsed position, a spring actuated locking member on said frame, hook means on said back member adapted to cooperate with said locking member to lock said back member in upright position, a supporting leg structure pivotally mounted on said seat frame and movable to collapsed position, releasable locking means for locking said leg structure in supporting position, and means for moving said locking member to release position to permit said back member to be collapsed, said last named means also operable to release said locking means for said leg structure.

6. A folding leg structure for an article of furniture having a main frame, comprising a pair of spaced bars rotatably mounted on the main frame and respectively carrying a pair of front legs and a pair of rear legs, a link connecting said rotatably mounted bars, and means to move said link longitudinally of said frame to rotate said bars and the legs connected thereto between extended and collapsed positions on the frame.

7. A folding leg structure for an article of furniture having a main frame, comprising a pair of spaced bars rotatably mounted on the main frame and respectively carrying a pair of front legs and a pair of rear legs, a link connecting said rotatably mounted bars, and a lever pivoted on said frame and drivingly connected to move said link with respect to the frame, whereby to turn said bars and the legs connected thereon between extended and collapsed positions on the frame.

8. A folding leg structure for an article of fur-

niture having a main frame, comprising a pair of spaced bars rotatably mounted on the main frame and respectively carrying a pair of front legs and a pair of rear legs, a link connecting said rotatably mounted bars, a supporting frame on which said legs are pivotally secured, and means to move said link longitudinally with respect to said frame to turn said bars and the legs connected therewith between extended and collapsed positions with respect to said main and supporting frames.

9. A folding leg structure for an article of furniture having a main frame, comprising a pair of spaced bars rotatably mounted on the main frame and respectively carrying a pair of front legs and a pair of rear legs, a link connecting said rotatably mounted bars, resilient means normally urging said link in a direction with respect to said frame to urge said bars and the legs connected thereto toward collapsed position on the frame, and releasable latch means operable to secure said bars and connected legs in extended position on the frame against the influence of said resilient means.

10. A folding leg structure for an article of furniture having a main frame and a back element pivotally mounted on said frame for movement between folded and extended position, comprising a pair of spaced bars rotatably mounted on the main frame and respectively carrying a pair of front legs and a pair of rear legs, a link connecting said rotatably mounted bars, and means drivingly connecting said link with said back element for longitudinally moving said link on said frame, whereby to swing said bars and connected legs between extended and collapsed positions on the frame in unison with movement of said back element on the frame.

RALPH L. JENSEN.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,061,935	Collier	May 13, 1913
2,244,399	Kovats	June 3, 1941
2,247,799	Boardman	July 1, 1941
2,460,791	Bernhard	Feb. 1, 1949

FOREIGN PATENTS

Number	Country	Date
645,493	France	June 27, 1928