Oct. 26, 1943. E. KOMENDA 2,332,858

DOOR

Filed Feb. 11, 1939

Fig. 4

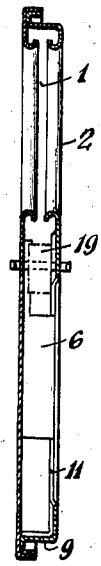


Fig. 1.

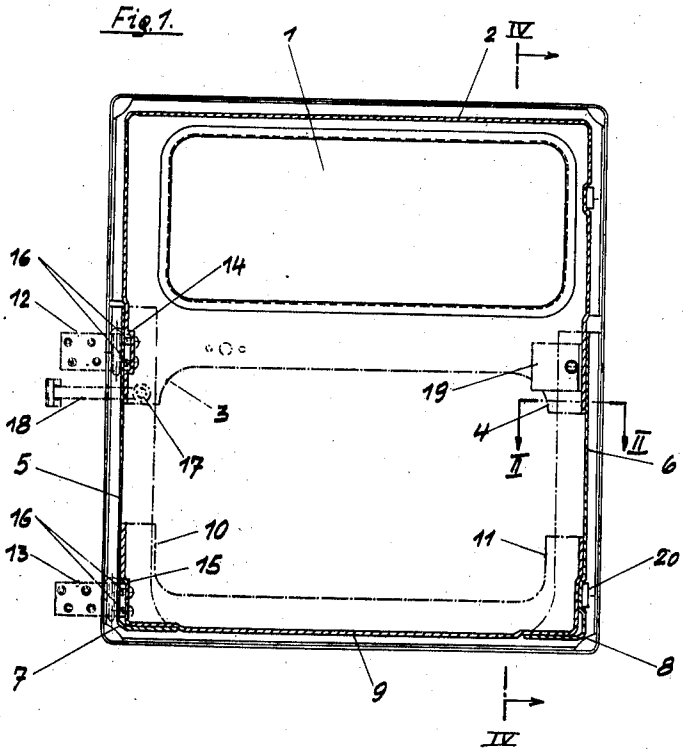


Fig. 5

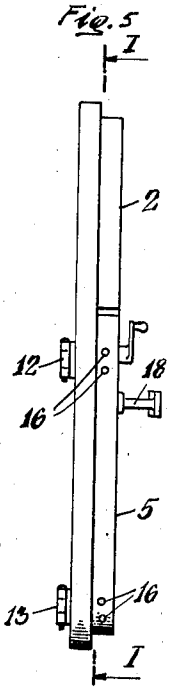


Fig. 2.

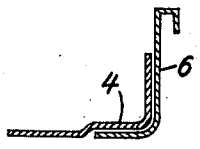
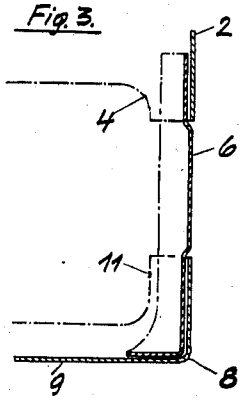


Fig. 3.



Inventor:
ERWIN KOMENDA
By A. A. Klicka
Attorneys

Patented Oct. 26, 1943 2,332,858

UNITED STATES PATENT OFFICE

2,332,858

DOOR

Erwin Komenda, Stuttgart-Korntal, Germany; vested in the Alien Property Custodian

Application February 11, 1939, Serial No. 255,841
In Germany February 16, 1938

5 Claims. (Cl. 296—44)

This invention relates to an improved door and more particularly to the inside wall of a sheet metal door of the type used in vehicles.

An object of this invention is to provide a sheet metal door, the inside wall of which may be fabricated with a minimum of expense and waste.

Another object of this invention is the provision of a door, the inside wall of which is formed from a plurality of easily and cheaply produced sheet metal parts.

Still another object of this invention is the provision of a door, the inside wall of which is formed from a plurality of readily assembled sheet metal parts.

A further object of this invention is to provide a sheet metal door, the inside wall of which is strengthened at those points which are ordinarily subjected to the greatest stress.

A more specific object of this invention is to provide a door, the inside wall of which is formed from a plurality of overlapping sheet metal members.

Further objects and advantages of the invention will be apparent from a study of the appended claims and of the description, taken in connection with the attached drawing, wherein:

Fig. 1 is a vertical cross-sectional view of the improved door construction taken along a plane lying between the outside and inside walls of the door;

Fig. 2 is a horizontal cross-sectional view taken along the line II—II of Fig. 1;

Fig. 3 is a partial cross-sectional view, similar to Fig. 1, illustrating a modified form of construction;

Fig. 4 is a cross-sectional view along the line IV—IV of Fig. 1; and

Fig. 5 is an end view of the left side of the door shown in Fig. 1.

As will be readily seen from a study of Fig. 1, the inside wall of the door is provided with the usual window opening 1, surrounded by sheet metal panel 2, forming the upper inside door face. The panel 2 is provided with downwardly extending projections 3 and 4 at opposite ends of the door, which are adapted to be overlapped by respective vertical door frame borders 5 and 6. The vertical door frame borders 5 and 6 are respectively extended to form bottom corners 7 and 8 for the door interior. A lower door frame border 9 is overlapped at each end by the corner portions 7 and 8 of the vertical frame borders 5 and 6. The lower frame border 9 is also provided with upwardly extending projections 10 and 11 at each end, which projections in turn, are respectively overlapped by the main section of the respective vertical door frame borders 5 and 6.

As is indicated by the dotted lines in Fig. 1 and by the cross-sectional view in Fig. 2, the overlapping between the projections 3 and 4 of the upper interior door panel 2 with the vertical door frame borders 5 and 6, and the overlapping of the latter with the lower door frame border 9 takes place not only at the sides and corners, but also along the inside wall itself. In order that the desired smooth contour of interior surface be preserved, those members which are overlapped, such as the projections 3 and 4 and the lower frame border 9, are preferably inwardly displaced to an amount substantially equal to the thickness of the overlapping members. As a result of this arrangement, the only outward evidence of the overlapping will be a thin line showing the meeting of the overlapping parts. This line may be substantially effaced by the application of paint or lacquer, and, of course, will entirely disappear if an additional lining is applied.

The connection of the individual sheet metal parts with one another can be brought about by any suitable well known means, the final choice being dependent upon the particular characteristics of the metal used. In some cases spot welding is desirable, while in other cases rivets or seam welds are more suitable.

One advantage of the proposed overlapping construction in addition to many other advantages thereof, is the fact that additional strength is provided at those portions of the inside door face which are ordinarily subjected to the greater amount of stress. As will be seen in Fig. 1, the door hinges 12 and 13 may be attached, in accordance with my construction, at points where there is a double thickness of metal, i. e., at portions formed by the overlapping parts, and preferably between the two overlapping parts. In order to facilitate connection of the hinges 12 and 13 with the door, in the preferred construction the downwardly extending projection 3 is formed with a pocket 14 and the upwardly extending projection 10 is formed with a pocket 15. The hinges extend into the pockets and are preferably connected to the door by means of rivets extending through both sheets of the overlapped metal. In Fig. 1 these rivets are indicated by the reference numeral 16.

A vehicle door is ordinarily also subjected to extraordinary strain at the point of attachment of the door check thereto. As indicated in Fig. 1, an opening 17 may be provided at the overlapping between the projection 3 and the vertical door

frame border 5, through which suitable means (not shown) can be inserted for connecting the door check 18.

In my preferred construction the door lock is likewise positioned at a place which is strengthened by the overlapping of the sheet metal members. As shown in Fig. 1, the lock 19 has been indicated as positioned at the overlapping between the projection 4 of the sheet metal panel 2, and the vertical door frame border 6.

It is likewise desirable that the door bumper be positioned at a point having considerable strength. To this end I prefer to place the door bumper 20 in a depression of that part of the vertical door frame border 6 which is overlapped by the upwardly extending projection 11 of the lower door frame border 9.

The construction illustrated in Fig. 3 is similar to that shown in Fig. 1 except that in this case the vertical door frame border 6 is overlapped by the projection 4 of the upper sheet metal member 2 and by the lower door frame border 9. In this case the vertical door frame borders are displaced inwardly to an amount substantially equal to the thickness of the overlapping parts.

The above described constructions offer many advantages over those previously used in the prior art. It is realized that constructions are known wherein a door frame is formed from individual sheet metal strips which is then covered by sheet metal walls. Such constructions, however, involve the problem of connecting the many parts together, necessitating a considerable expense of time. Furthermore, the parts must be very accurately dimensioned and even then much supplemental work and waste occurs because of inaccuracy. These disadvantages can be avoided by constructing the inside and outside walls from a single piece of sheet metal. This, however, necessitates the use of large and expensive presses and if errors occur, as experience has shown they do, the waste is greater because of the larger size of the pieces used.

In contrast to the above, by using relatively small sheet metal parts, as in applicant's construction, fabrication is accomplished through the use of relatively light and inexpensive machinery. By overlapping these parts at suitable places, the complete construction will be relatively stronger at those points where the heaviest strain occurs. The overlapping arrangement also results in an ease in assembling the parts of the door in that the various parts are in effect automatically guided relatively to one another.

It will be obvious to those skilled in this art that the principles of my construction are applicable to doors of various shapes and character, provided that the principles of my construction, namely the division of the door into a plurality of overlapping sheet metal parts, are followed. Accordingly, I do not intend that the scope of this invention be limited to the precise construction illustrated, but only as may be required by the claims which follow:

1. In a door having inside and outside walls, the combination of means forming said inside wall including a sheet metal panel forming the upper portion of said inside wall, provided with a pair of downwardly extending projections, a pair of vertical door frame borders, one at each end of said door, overlapping with said respective projections, a bottom door frame border interconnecting and overlapping with the lower ends of said vertical frame border, a door checking device, and means for attaching said door checking device at the section of overlapping of one of said sheet metal panel projections with one of said vertical door frame borders.

2. In a door having inside and outside walls, the combination of means forming said inside wall including a sheet metal panel forming the upper portion of said inside wall, provided with a pair of downwardly extending projections, a pair of vertical door frame borders, one at each end of said door, overlapping with said respective projections, a bottom door frame border inter-connecting and overlapping with the lower ends of said vertical frame border, a door lock, and means for attaching said door lock at the section of overlapping of one of said sheet metal panel projections with one of said vertical door frame borders.

3. In a door having inside and outside walls, the combination of means forming said inside wall including a sheet metal panel forming the upper portion of said inside wall, provided with a pair of downwardly extending projections, a pair of vertical door frame borders, one at each end of said door, overlapping with said respective projections, a bottom door frame border interconnecting and overlapping with the lower ends of said vertical frame border, one of said door frame borders being formed with a depressed portion in that part thereof overlapping with one of the other door frame borders, and a resilient door bumper mounted in said depressed portion.

4. In a door having inside and outside walls, the combination of a sheet metal panel provided with a window opening therein, forming the upper portion of the inside wall, additional sheet metal members overlapping with and rigidly connected to said upper portion and forming the lower portion of said inside wall, door supporting means extending between the overlapped portions of said door, and means for rigidly attaching said door supporting means to said overlapping door portions.

5. In a door having inside and outside walls, the combination of means forming said inside wall including a sheet metal panel forming the upper portion of said inside wall, provided with a pair of downwardly extending projections, a pair of vertical door frame borders, one at each end of said door, overlapping with said respective projections, a bottom door frame border inter-connecting and overlapping with the lower ends of said vertical frame border, door supporting means extending between the overlapped portions of said door, and means for rigidly attaching said door supporting means to said overlapping door portions.

ERWIN KOMENDA.