

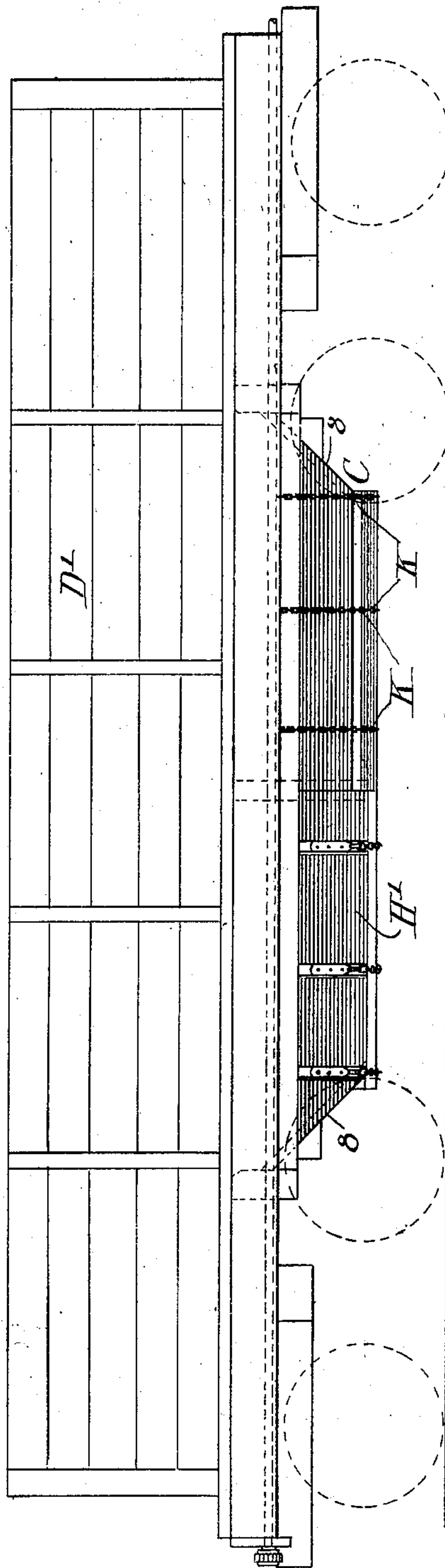
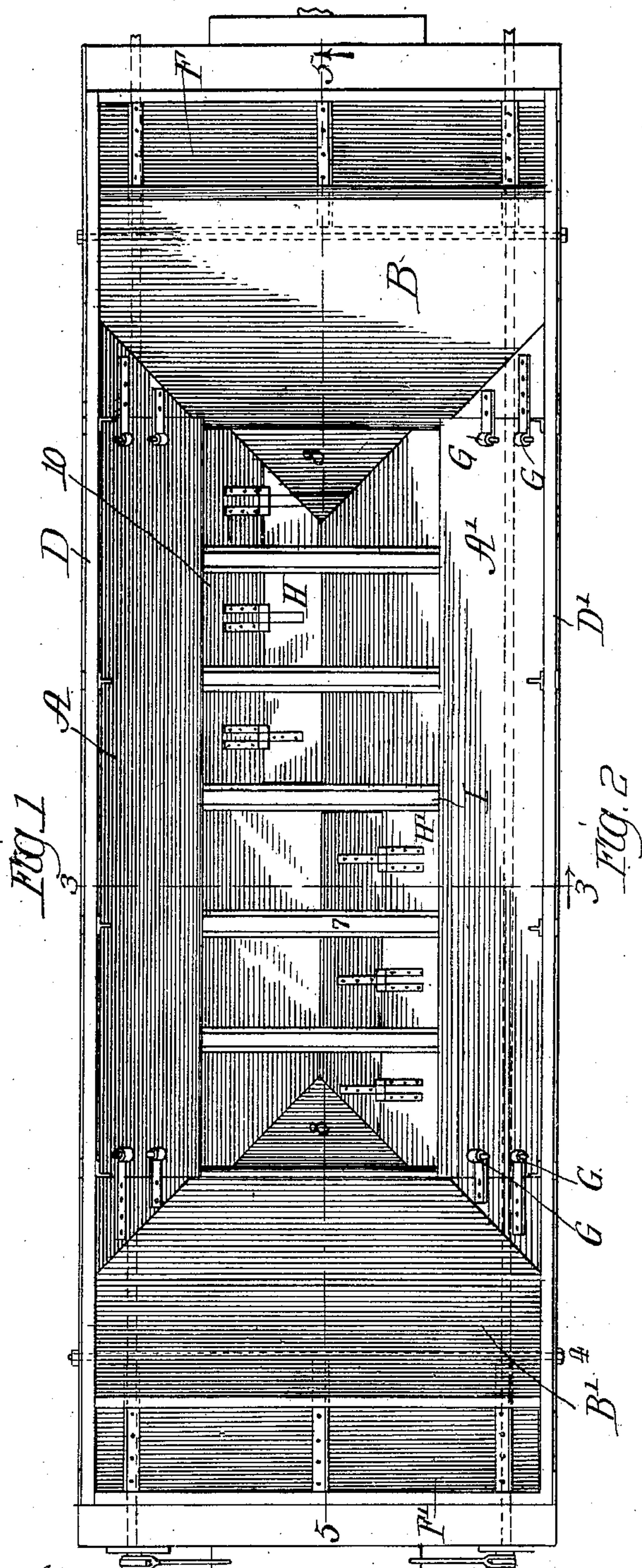
No. 862,221.

PATENTED AUG. 6, 1907.

W. W. WALLACE.
CONVERTIBLE CAR.

APPLICATION FILED FEB. 19, 1907.

4 SHEETS—SHEET 1.



Witnesses:
H. G. Barrett
O. G. Freiburg

Inventor:
William W. Wallace
By Chas. S. Page Atty

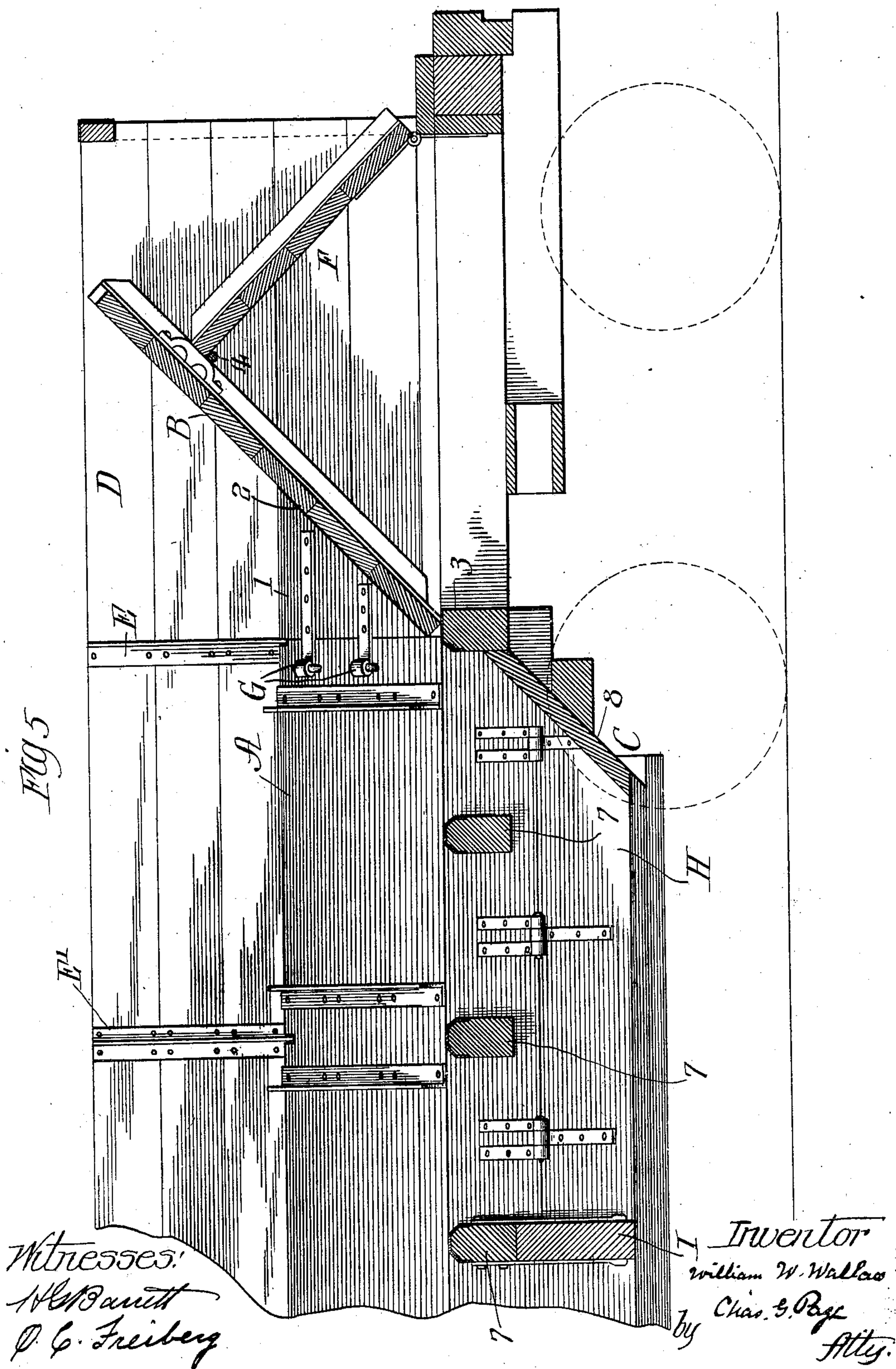
No. 862,221.

PATENTED AUG. 6, 1907.

W. W. WALLACE.
CONVERTIBLE CAR.

APPLICATION FILED FEB. 19, 1907.

4 SHEETS—SHEET 3.



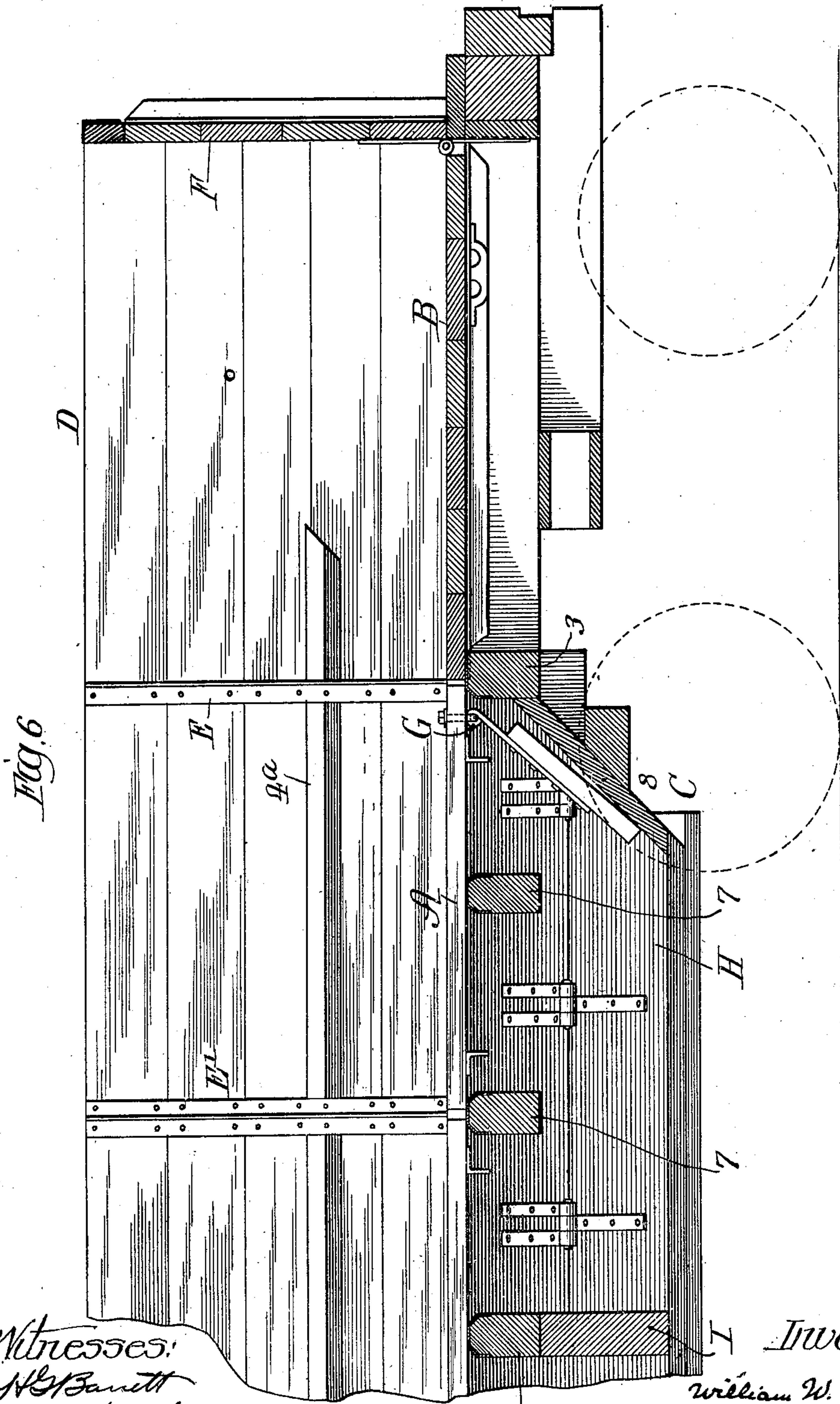
No. 862,221.

PATENTED AUG. 6, 1907.

W. W. WALLACE.
CONVERTIBLE CAR.

APPLICATION FILED FEB. 19, 1907.

4 SHEETS—SHEET 4.



Witnesses:
H. B. Barrett
O. C. Freiburg

Inventor:
William W. Wallace
by Chas. E. Page Atty

UNITED STATES PATENT OFFICE.

WILLIAM W. WALLACE, OF KNOXVILLE, TENNESSEE.

CONVERTIBLE CAR.

No. 862,221.

Specification of Letters Patent.

Patented Aug. 6, 1907.

Application filed February 19, 1907. Serial No. 358,201.

To all whom it may concern:

Be it known that I, WILLIAM W. WALLACE, a citizen of the United States, residing at Knoxville, in the county of Knox and State of Tennessee, have invented certain new and useful Improvements in Convertible Cars, of which the following is a specification.

My invention relates to cars of the class known as convertible cars and involving as a matter of general construction a car adapted for service as a hopper or ballast dumping car and also adapted to be readily converted from a hopper or ballast dump car into a gondola car for other kinds of freight. In cars of this class, the car body has usually been provided with a permanent lower hopper portion extending below the plane of the floor of the car bed or body, the car being also provided with certain board sections adapted to be brought together to form the four sides of an upper hopper portion in position to combine with the lower hopper portion and thereby provide a hopper of large carrying capacity. The hopper thus constructed is horizontally oblong so as to utilize the available length of the car body, and its lower portion is provided with a door or valve device for establishing and cutting off the discharge from the hopper. In these convertible cars, the sides and ends of the upper hopper portion have been separated and disposed of in various ways in order to change the style of car.

In a convertible car characterized by my improvements the longitudinal sides of the upper hopper can be moved and used as flooring for covering the top opening of the lower hopper, and the transverse ends of the upper hopper can be brought down and used for forming car body flooring between the car ends and the two hopper sides when the latter are in position for covering the lower hopper and forming a portion of the floor of the converted car. By this simple arrangement all or substantially all of the floor of the gondola car can be formed by the entire upper hopper or hopper portion consisting of two longitudinal side sections and two transverse side sections termed the ends or end sections. When the car is reconverted from a gondola into a hopper car, the temporary middle flooring portions are raised and adjusted in position for forming opposite longitudinal sides of an upper hopper portion, and the temporary end flooring portions are raised into position for forming the transverse end sections of such upper hopper portions. The hopper ends are placed and held in a properly inclined position, and for such purpose, broadly considered, any suitable or desired holding means or device can be used. As a matter of further improvement the ends of the car body are movable or hinged at their lower portions so that when the end floor portions have been raised to inclined positions to form the ends of the hopper and in conjunction with the longitudinal sides complete the hopper structure, the hinged body or box ends of the

car can be swung toward the hopper to an extent to assume an inclined position and abut against the rear sides of the inclined hopper ends. In this way the car end portions previously covered by the upper hopper ends will be covered or roofed over by the hinged ends of a car box, thereby preventing spilled portions of material which is being loaded into the hopper by a crane device or the like from depositing on the running gear of the car. The car body ends thus swung into position to bear against the upper hopper ends also form abutments or braces backing the transverse ends of the upper hopper, and when separate devices for fastening or upholding the inclined hopper ends are omitted for any reason whatsoever, these car ends acting as braces will back and steady the hopper ends, and even when other devices are employed for holding up the hopper ends in inclined position, these hinged car body ends can be used as an auxiliary to such devices and oppose sagging of the hopper ends by reason of internal pressure against the same.

Objects of my invention are to simplify the disposition of the upper hopper when it is knocked down or taken apart so as to convert the car from a hopper car into a gondola car; to avoid detaching and bodily moving the car body ends into position for forming hopper ends; to avoid mutilation of the car body ends; to utilize the car body ends as shields or coverings for end portions of the truck when the upper hopper ends are raised to an extent to expose portions of the running gear; to substantially form the entire floor of the gondola car by the four inclined sides which can be used to form a complete hopper portion; to provide a simple and efficient construction; to use portions of the box body of a gondola car as braces; and to provide certain improved details of construction.

In the accompanying drawings: Figure 1 is a top plan of the car arranged to form a hopper or dumping ballast car. Fig. 2 shows the car in side elevation. Fig. 3 is a transverse section on dotted line 3--3 in Fig. 1. Fig. 4 is a transverse section taken through the car on the plane of Fig. 3, but illustrating the car converted from the hopper or ballast dumping car of Figs. 1 and 3, into a gondola car. Fig. 5 is a longitudinal section on a vertical, central plane of a portion of the car converted from a gondola into a hopper or ballast dumping car, the plane of the section being indicated by dotted line 5--5 in Fig. 1, it being observed that Fig. 5 is on a somewhat larger scale. Fig. 6 is a section corresponding with Fig. 5 with the exception that the hopper car of Fig. 5 is in Fig. 6 converted into a gondola car.

The car arranged as a hopper or ballast car as it may be indifferently termed, is shown in Figs. 1, 3 and 5. As thus shown, the upper hopper portion consists of two inclined longitudinal side portions A, A', and two inclined transversely arranged side portions B, B',

herein termed end portions or end sections of the hopper in contradistinction to the longitudinal side portions or sections A, A'. This upper hopper portion as a whole is arranged to practically form an upper extension of the lower hopper portion C, which latter is usually secured in place as a fixture extending below the floor lever and which is simply left in place and covered over when the car is converted from a hopper or ballast car into a gondola car. The car body for all of its uses may have and is shown with ordinary sides D, D', suitably held in place and preferably secured to upright stakes or angle braces E, E', the angle braces E being at points to permit the lower corner portion of the hopper ends B to bear against them when such ends are in position for forming the two end sections of the upper hopper, as in Figs. 1, 3 and 5, it being observed that the hinged end piece 1 of one of the hopper sides A as shown in Fig. 5, conceals the point where a lower corner of the end section B of the hopper is understood to abut against the lower end portion of a brace E. The end sections B, B', of the hopper are preferably rectangular and each of the two sides A and A' of the hopper is provided at each end with one of said angular extension pieces 1, hinged thereto and arranged so that in completing the upper hopper portion the oblique edges 2 of these hinged pieces can be brought against the inclined upper hopper ends B, B', and in this way the corners of the hopper will be closed.

The ends F, F', of the box portion of the car are hinged to the body at their lower ends so that they can be swung from their vertical position (Fig. 6) toward the center of the car and to an extent to permit their upper portions to engage with the inclined ends B, B', of the upper hopper portion, either directly or indirectly through the medium of any desired brackets or bearings attached to the outer sides of the said inclined hopper ends. In Fig. 6 which is a longitudinal vertical section of about one-half of the car length, the lower edge of the hopper end B rests upon a cross sill 3, its corner edges being stayed by the lower end of the angle brace E, shown in such figure, as hereinbefore more fully described. The hopper end B can also be maintained in the inclined position shown by any desired means. The figure indicates a removable cross rod or bolt 4 which may engage in bearings in opposite sides of the body as illustrated in dotted lines, Fig. 1, and with such arrangement the end section B can be held or locked in position by such cross rod or bolt as in Fig. 5. But with this arrangement the car end F backing the inclined hopper end will prevent sag of the rod and hopper end when subject to the pressure of a heavy load, and hence, the inclined car end F will brace the hopper end and form an effective abutment. Should the rod or other like device be omitted or become lost or broken, the car end F can be used for bracing and holding up the hopper end, and if desired, it can be temporarily connected therewith by any suitable attachment, and hence, I desire to broadly claim the car end movable into position to form a brace for the hopper end when the car is used as a hopper car, and then movable back into position to form the upright end of the body of a gondola car. It is also here observed that the car end F does not form any section or part of the knock-down hopper, which

latter is composed of the four separable sections A, A' and B, B', the sections A, A', being as hereinbefore described provided with the angular end extension sections 1. As the remaining half of the car length shown in Fig. 5, involves a construction and details the same as shown in said figure, a description of the one half end portion will answer for both.

In the hopper car the upper portions of the longitudinal upper hopper sides A, A', engage and are supported in position by bearings or cleats 4^a, 4^a, on the sides D, D', of the car body, as in Fig. 3, and the lower portions of these hopper sides A, A', can be supported in any known or desired way, consistent with the direction of material from the upper hopper portion with the lower hopper portion, and also permitting such longitudinal sides of the upper hopper portion to be moved into position for covering over the lower hopper portion when the car is to be converted from a ballast or hopper car into a gondola car. As shown, their lower marginal portions bear and rest upon inclined bearings formed by longitudinal sills 5, 5, their lower edges being temporarily fitted against the upper edges of the inclined longitudinal sides 6, 6, of the lower hopper.

In order to convert the car from a ballast or hopper car into a gondola car, the upper hopper sides A, A', can be inverted and brought down so as to cover over the lower hopper portion and form a floor portion between two permanent longitudinally extending and relatively narrow side floor portions 6^a, 6^a, shown in Figs. 3 and 4, it being observed that the sections A, A' when thus used as flooring, are supported by the longitudinal sills 5, 5, and also by cross sills 7, (see also Fig. 6) and that when the upper hopper ends A, A' have been thus inverted and brought into the position shown in Figs. 4 and 6, the hinged end sections 1 of the said sides will drop into the lower hopper and rest against the end walls 8 thereof as in Fig. 6, which shows one of such hinged sections.

The longitudinally arranged floor portions 6^a at opposite sides of the top opening of the lower hopper portion terminate short of the ends of the car, so that in changing the car from a hopper or ballast car, the hopper ends B, B' can be let down to form end floor sections the width of the desired floor and also extending between the ends of the car and the ends of the lowered hopper sides A, A', (Fig. 6) and between the ends of the flooring portions 5 and said car ends F, F'. Prior to thus bringing down the ends B, B' of the hopper, the car ends are swung from the previously inclined position into a vertical position shown in Figs. 1, 4 and 6 where they coact with the body sides D, D' to form the ends of the box body of a gondola car. It will also be seen that as the upper hopper sides A, A' are inverted prior to lowering them into position for flooring over the lower hopper or hopper portion, the hinges G which attach the triangular sections 1 to the longitudinal side boards or sections of the upper hopper portion, will permit the sections 1 to drop down out of the way as illustrated in Figs. 4 and 6, and thereby permit the boards or sections A, A', to be made into squared ends so that when they are lowered into position for flooring they will present square ends to the adjacent ends of the lowered hopper sections B, B'. As these hopper ends B, B' form the end floor

portions of the gondola car, it is not necessary to provide the end portions of the car with any other flooring, and hence, all of the flooring portions will be on a uniform level. When the upper hopper sides are let
 5 down into position to rest on the longitudinal sills 5, they will also rest on cross sills 7, a series of such cross sills being shown exposed in Fig. 1. When the end flooring portions formed by the hopper ends B, B' are raised into position for again forming an upper hopper,
 10 the trucks and running gear will be largely uncovered and hence, if material delivered to the hopper car by a crane and bucket spills from the latter, the end running gear can be protected therefrom by swinging forward the car ends F so that they will abut against the
 15 inclined upper hopper ends and thereby roof or shield over the end portions of the car.

In ordinary hopper cars it is common to open a longitudinally extending hopper door or gate for the purpose of discharging the load, and in some cases two of
 20 such doors have been arranged alongside one another and actuated so that when desired, the doors can be opened in alternation for discharging respectively toward opposite sides of the track. But as a matter of further improvement, I provide the lower hopper portion with two longitudinally extending hinged bottom
 25 doors H and H' arranged in staggered relationship, as best shown in Fig. 1, wherein the bottom door H extends along about or nearly one half the length of the oblong hopper bottom, while the other door H' extends along about or nearly the remaining half of such
 30 length of the oblong bottom, it being observed that a lower portion of one inclined side of the lower hopper is formed by the door H and that a lower portion of the opposite inclined side of such hopper is formed by the door H'. Also that each door coacts with a portion of the lower edge of an opposite inclined side of the lower hopper to form a part of the vertex portion of the hopper when the door is closed. The doors thus progressively arranged are also respectively at opposite
 35 sides of the vertex line of the oblong hopper, and in order to divide the hopper with reference to these doors, a vertical partition is arranged in the lower hopper portion between the relatively adjacent ends of the doors, and hence at or about midway of the horizontal length of the oblong hopper. As shown, one of the cross sills 7 forms the upper part of such partition, the remainder of the partition being formed by a transverse vertical partition portion I shown in Figs. 5 and 6. The doors have their upper portions hinged to
 40 the lower hopper sides as illustrated, and are operated by chains or cables or cable and chain winding and unwinding devices. For example, door H' is operated by chains K attached to the door and also attached to a longitudinally arranged reversible rotary winding
 45 shaft L, and the door H at the opposite side is in like manner operated by a similar set of chains K' attached both to the door and to a reversible rotary winding shaft L, and as shown these chains cross the lower portion or vertex of the lower hopper portion. By thus
 50 arranging the doors of a hopper in a ballast dumping car, one half of the load can be dumped along a portion of the track and the other half of the load can then be dumped along a succeeding portion of the track, and by employing the middle partition, the division of the load is more completely controlled and

effected. While the chains and rotary shafts are shown as means for operating the door, in alternation, I do not confine myself to such specific arrangement as any suitable known or other preferred door closing device can be employed.

70

From the foregoing it will be seen that the car is provided with a knock-down hopper, that is to say, the hopper sides which extend above the floor level form a knock-down hopper or hopper portion. The lower hopper is valved and may be regarded as a permanent device. As a matter of course the upper
 75 knock-down hopper or hopper portion and the lower permanent hopper or hopper portion can combine to form a hopper extending above and below the floor level. I desire however to broadly cover a knock-down hopper in certain combinations and arrangements as hereinafter set forth in the claims.

75

80

What I claim as my invention is:

1. A convertible car having a knock-down hopper, and movable car ends which are changeable from positions for forming the ends proper of a box body, into inclined positions for forming braces backing the end sections of the said hopper.

85

2. A convertible car having a knock-down hopper, the end sections of which are changeable into position for forming end flooring portions of the car, and movable car ends proper which are changeable from positions for forming the ends of a box body into inclined positions for forming braces backing the end sections of the said hopper.

90

3. A convertible car having a knock-down hopper, and car ends hinged for forming the ends proper of a box body and in alternation therewith for swinging into position for forming inclined braces backing the end sections of the said hopper.

95

4. A convertible car having a knock-down hopper, and car ends hinged upon the car frame at their lower portions and adapted for forming the ends proper of a box body and in alternation therewith for tilting toward the hopper and forming inclined braces backing the end sections of the said hopper.

100

105

5. In a convertible car a lower permanent hopper and an upper knock-down hopper having its longitudinal sides changeable into position for forming flooring over the lower hopper, said hopper also having its end sections changeable into position for forming flooring between such temporary longitudinally extending floor portions and the ends of the car, the longitudinal side sections of the knock-down hopper being provided with angular end extensions hinged thereto and adapted and adjustable for fitting against the hopper end sections when the latter are in position for forming the hopper ends and for swinging out of the way when the hopper ends are moved into position to form temporary floor sections.

110

115

6. In a convertible car a lower permanent hopper and an upper knock-down hopper having its longitudinal sides changeable into position for forming flooring over the lower hopper, said hopper also having its end sections changeable into position for forming flooring between the longitudinally extending floor portions and the ends of the car, the longitudinal side sections of the knock-down hopper being provided with angular end extensions hinged thereto and adapted for fitting against the hopper end sections when the latter are in position for forming the hopper ends, the hinges between the longitudinal hopper sides and their angular end extensions being arranged to permit the said angular end extensions to drop down below the level of the floor when the longitudinal side sections of the hopper are changed into position for forming a floor portion over the lower hopper.

120

125

130

7. In a convertible car the lower permanent hopper and the upper knock-down hopper having its longitudinal sides provided with hinged angular extensions which fit against the end sections of the hopper when the parts are in place for thus forming a knock-down hopper, the end sections of the knock-down hopper being substantially rectangular and

135

140

changeable into position to floor over the end car frame portions, and the side sections of said knock-down hopper being invertible and changeable into position to floor over the lower hopper and permit their angular end extensions
5 to drop down below the level of such flooring, the construction of the knock-down hopper relatively to the car body being proportioned so that when the hopper sections are in position for forming flooring, the end portions of the car frame will be floored over by the lowered end sections of the hopper while the portion of the car between
10 such end flooring portions is floored over by the lowered side sections of the hopper which cover over the lower hopper and at their ends meet the end flooring portions, and by two relatively narrow longitudinally extending side flooring portions having their ends meeting the end flooring sections and being provided as fixtures on the body-frame
15 of the car.

8. The combination with the car body having a hopper extending below the plane of its floor or platform portion,
20 of a couple of hinged longitudinally extending doors re-

spectively forming laterally swinging parts of the opposite inclined converging sides of the hopper, and arranged in staggered relationship along opposite sides of the middle or vertex line of such hopper; and door closing devices for separately controlling the two doors. 25

9. The combination with the car body having a hopper extending below the plane of its floor or platform portion, of a couple of hinged longitudinally extending doors respectively forming laterally swinging parts of the opposite inclined converging sides of the hopper, and arranged in
30 staggered relationship along opposite sides of the middle or vertex line of such hopper; door closing devices for separately controlling the two devices, and a transverse partition within the hopper and between the adjacent ends of the two doors.

WILLIAM W. WALLACE.

Witnesses:

R. E. GODDARD,

W. F. BEORD.