Dec. 23, 1958 G. E. BOCK ET AL 2,865,306

TRAIN CONSIST

Filed March 16, 1956 2 Sheets-Sheet 1

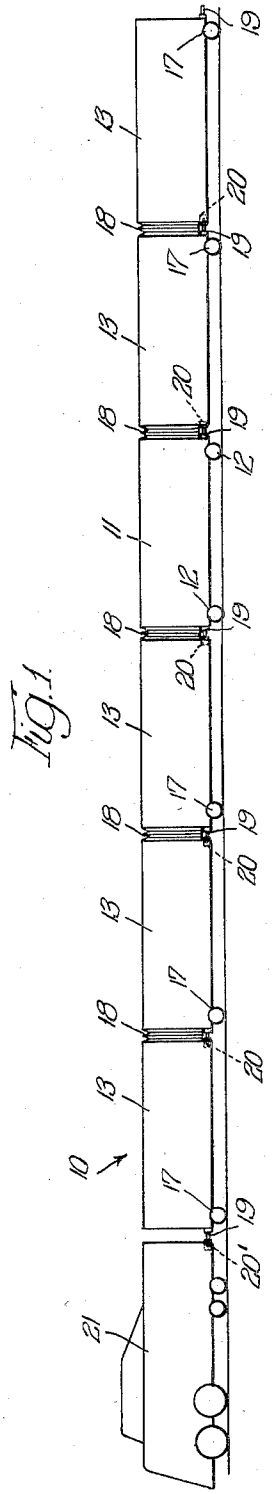

Fig. 1.

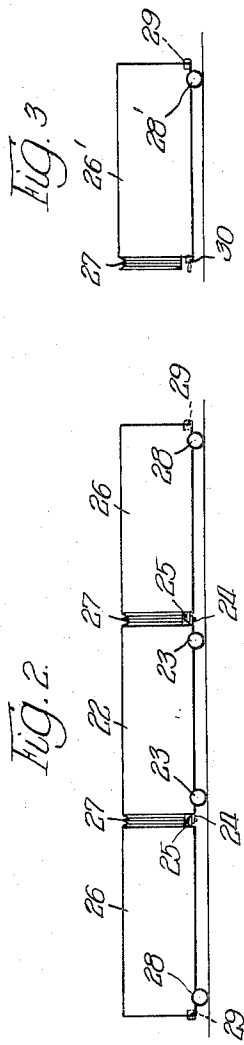

Fig. 3

Fig. 2.

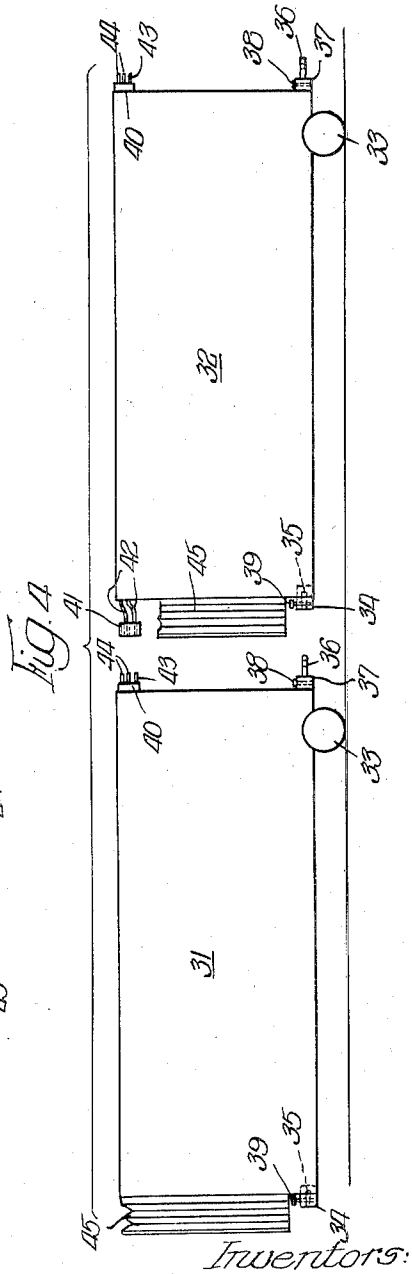

Fig. 4

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TRAIN CONSIST

Filed March 16, 1956 2 Sheets-Sheet 2

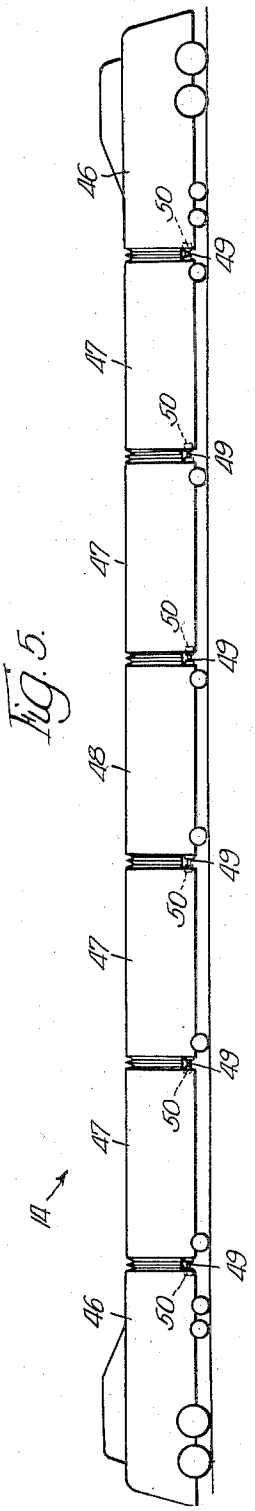

Fig. 5.

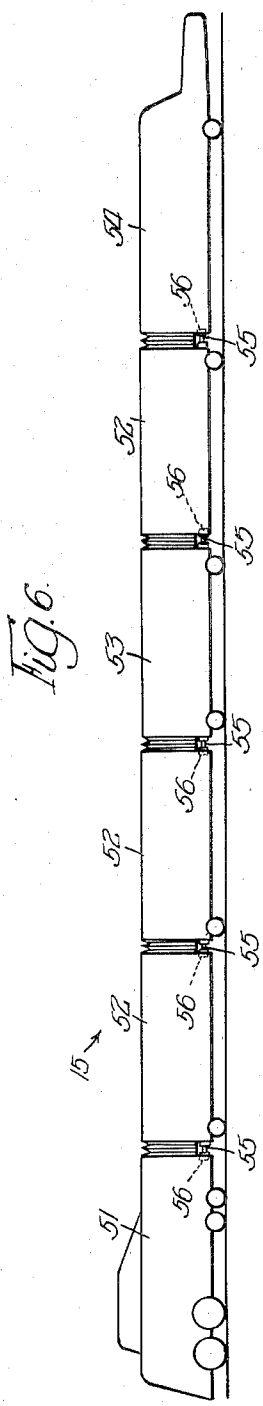

Fig. 6.

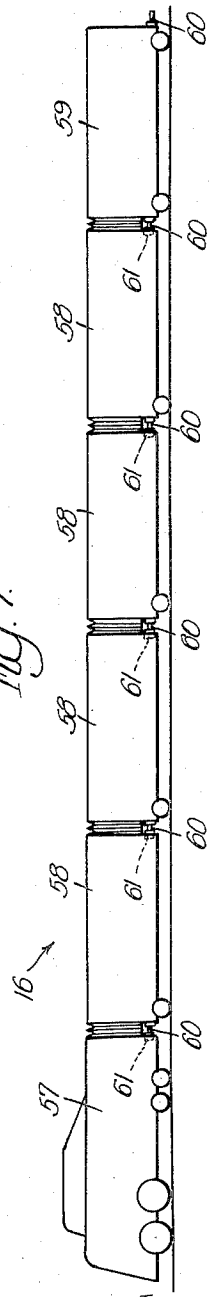

Fig. 7.

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United States Patent Office 2,865,306
Patented Dec. 23, 1958

2,865,306

TRAIN CONSIST

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Application March 16, 1956, Serial No. 571,862

12 Claims. (Cl. 105—3)

The present invention relates generally to a new and improved train consist which includes the use of at least one self-supported car interconnected with a plurality of single axle cars which are of standardized design and capable of forming a train consist with the self-supported car which is adapted for bi-directional operation.

Recent efforts in improving railway car construction have included the emphasizing of lightweight construction for high speed operation. In reducing the over-all weight of a complement of cars, considerable interest has been shown in the use of single axle cars which are interconnected with one another in load-bearing support by the use of load-bearing couplers. An example of a consist formed from cars of this type is that which includes the use of one or more interconnected three-car units. Each of the units includes the use of a center double axle car, one of the axles being located at each end of the car to impart self-support to the same. On each end of the self-supported car is permanently coupled a single axle car, each of these cars carrying its axle at the end furthermost from the center car. A train consist formed from units of this type will include either a single unit or a plurality of such units. As a result it is impossible to form a consist of a number of cars which is less than three or less or greater than a multiple of three. A situation of this nature is undesirable as the passenger requirements for a train formed from units of this type will not always correspond to the use of three cars or multiples thereof and it is often found that some of the cars are being unnecessarily used thereby increasing the operating costs for a particular train.

Train consists have been formed from a plurality of single axle cars which are interconnected with one another in load-bearing support by the use of load-bearing couplers. Trains of this nature are by necessity uni-directional in operation as it is necessary to utilize the locomotive at the coupler-supported end of the consist in load-bearing support of the axle-less end of the leading car.

These problems, namely, unitized consists and uni-directional operation, tend to unduly complicate the procedure of making up a train for a specific run and, for the sake of efficiency, lightweight trains of the type now in use are generally restricted in their use for specified runs which from day to day require substantially the same passenger or freight capacity.

It is an object of the present invention to provide a new and improved train consist which is derived from the use of specially designed cars all of which may be standardized in the production thereof and which consist is readily adapted for variation with respect to the number of components forming the total thereof in line with efficient use of existing train yard facilities and procedures.

Another object is to provide a train consist which may be derived from the use of not more than one self-supported car provided with identical forms of coupling members on the ends thereof and a plurality of partially self-supported cars which are identical in construction

particularly with respect to the types of coupling members carried by the ends thereof, and which partially self-supported cars may be readily interconnected with one another or in load-bearing relation with the self-supported car at either end thereof to form a complement of cars of any specified number, each of the exposed ends of the consist resulting from such complement being adapted for interconnection with a locomotive for bi-directional operation.

A further object is to provide a single axle car of simplified design and standardized features to allow full and efficient use of a plurality of such cars in the making up of a train consist, which standardized features include simplification of coupling members and utility sources and connections to materially reduce over-all weight and cost of manufacture as well as aid in eliminating improper interconnections between cars.

Still another object is to provide a lightweight train including the use of cars of improved design, which cars are readily adapted for low cost manufacture and are capable for use in operation in conformance with efficiency and safety requirements and which cars are further readily adapted for efficient use with train yard facilities and existing train make-up procedures.

Other objects not specifically set forth will become apparent from the following description of the present invention made in conjunction with the drawings wherein:

Fig. 1 is a schematic showing of a train consist incorporating the principles of the present invention;

Fig. 2 is a schematic showing of a modified form of three-car unit which is adapted for use as a nucleus unit in forming a train consist having the same operational advantages as the consist shown in Fig. 1;

Fig. 3 is a schematic showing of a modified form of a standardized single axle car;

Fig. 4 is a schematic showing on an enlarged scale of an unconnected pair of the new and improved standardized single axle cars of the present invention illustrating the important structural features and advantages arising therefrom allowing such cars to be used with increased efficiency; and

Figs. 5–7 are schematic showings of different consists which may be formed by using the improved single axle car in combination with the improved double axle unit.

In Fig. 1 a general consist **10** is schematically shown illustrating a made-up train including the specially designed cars forming a part of the present invention. The train includes one double axle car **11** which is provided with two longitudinally spaced axles positioned near the opposite ends of the car. The positioning of the axles of car **11** are indicated by the location of the wheels **12** carried thereby. The car **11** may be of conventional design and if preferred may be used as the entrance car to allow passengers to gain access into adjacent cars of the train. As will subsequently be described, the car **11** need not be provided with end diaphragms for enclosing the spaces between associated cars.

The remainder of the consist **10** is formed from a plurality of single axle cars **13** of standardized design. Each of these cars **13** is provided with a single axle near one of its ends as indicated by the position of the wheels **17**. As a result of the use of a single axle for each car **13**, the cars are provided with a wheel-supported end and a coupler-supported end. The coupler-supported ends of the cars **13** carry diaphragms **18** which are adequate for completely enclosing a passageway between interconnected cars. The wheel-supported ends of the cars **13** are provided with male coupling members **19** which are adapted to be received in female coupling members **20** of adjacent cars **13** carried at the opposite ends of the cars **13**. As illustrated in Fig. 1, each of the cars **13** is standardized with respect to its male and

female coupler locations. The wheel-supported ends of these cars are provided with male coupling members **19** while the coupler-supported ends are provided with female coupling members **20**. As each of the cars **13** is standardized in this respect, they must be interconnected with one another in a specified manner.

In order to allow the cars **13** to be coupled at either end of the consist **10**, the self-supported car **11** is provided at each of its ends with a male coupling member **19** for interconnection in load-bearing support with female coupler-carrying ends of the cars **13**. By providing the car **11** with male coupling members **19** at each of its ends the standardized cars **13** interconnected therewith are always arranged to have their male coupler-carrying ends exposed for interconnection with additional cars **13** of similar design. As a result, starting from either end of the car **11**, any number of cars **13** may be interconnected with one another in load-bearing support and the exposed end of the furthermost car **13** will be supported by its single axle with its male coupler **19** exposed. Consequently, each of the exposed ends of the consist **10** is self-supported and is provided with male couplers **19** for interconnection with a female coupler **20'** carried by a locomotive **21**. The diaphragms **18**, being carried by the coupler-supported ends of the cars **13**, allow the use of a single diaphragm to completely enclose a passageway between adjacent cars and each diaphragm will always be positioned opposite the wheel-supported end of an adjacent car which carries no diaphragm. The male and female coupling members **19** and **20** may be of any design, such as shown in Fig. 4 and to be described, as long as they are capable of cooperating in mating load-bearing relation with one another to provide support to the otherwise unsupported end of a connected car.

The advantages of the particular design of cars **11** and **13** described in connection with Fig. 1 are many. In a single train of any desired length including any desired number of cars, it is necessary merely to utilize one double axle car, such as the car **11**, to provide a consist which is completely self-supporting without the necessity of load-bearing support from other means such as detachable dollies or locomotives. The use of a plurality of cars **13** which are substantially identical standardizes and materially simplifies manufacture of the cars, and the lightweight nature of the cars, primarily due to the elimination of an axle and its associated mounting members, materially reduces the over-all expense of manufacture. The uniformity existing with respect to the type of coupling members used at either ends of the cars allows similar cars to be readily connected at either ends of the consist **10**. As a result, any number of cars may be added to the consist without the necessity of adding additional self-supported cars **11**.

While the consist **10** of Fig. 1 has been described as including a plurality of standardized cars **13** carrying at the wheel-supported ends thereof a male coupling member and at the coupler-supported ends thereof a female coupling member, the reverse of this arrangement also be used providing the reverse arrangement is uniformly applied to all of the single axle cars. Still further, shop-connected units may be formed if desired. To illustrate these modifications, reference is made to Figs. 2 and 3.

In Fig. 2, a three-car shop-connected unit is schematically shown as including a center self-supported car **22** which is provided with longitudinally spaced axles near each of the ends thereof similarly as described in connection with car **11** of Fig. 1. The position of the axles of the car **22** are evidenced by the wheels **23** shown in the drawing. Car **22** is provided with weight-bearing flanges **24** at each of the ends thereof which are pin-connected to flanges **25** in load-bearing support of the unsupported ends of single axle cars **26**. The single axle cars **26**, similarly as the cars **13**, carry diaphragms **27** at the coupler-supported ends thereof for enclosing the passageways between the interconnected cars **22** and **26**. The single axles of the cars **26** are located near one end of each of the cars as evidenced by the positioning of the wheels **28**. The three-car unit of Fig. 2 is provided at its ends thereof with female coupling members **29** of the type previously described.

Fig. 3 illustrates a single axle car **26'** identical in construction to the cars **26** of Fig. 2 with the exception that the coupler-supported end of the car **26'** is provided with a male coupling member **30**. The wheel-supported end of the car **26'** is provided with a female coupling member **29** and the coupler supported end thereof is provided with a diaphragm **27** of the type previously described. In comparing the cars **26** and **26'** with the cars **13** it will be noted that the only difference existing between these cars is the reversed mounting of the male and female coupling members. This difference is illustrated for the purpose of fully bringing out an important feature of the present invention, namely, that the single axle cars manufactured should be standardized with respect to the features discussed above so as to provide a consist of any number of such cars being provided at the exposed ends thereof with the same type of cupling member whether it be male or female. The three-car unit of Fig. 2 is arranged to provide at each of its exposed ends a female coupling member for load-bearing mating with a male coupling member carried by the car **26'** of Fig. 3 at the unsupported end thereof or with a male coupling member carried by a locomotive or other power means.

Uniformity in the manufacture of single axle cars, either in the form shown in Fig. 1 or Fig. 3, provides standardization with accompanying reduced cost. Furthermore, full and efficient use of the single axle cars as compared with the use of conventional self-supported cars may be obtained in line with existing train yard facilities and train make-up procedures. No matter where the self-supported car, such as **11** or **22**, is located in a complement of cars a single axle car may be connected to either of the exposed ends of the complement and the resulting consist will still be provided with a similar type of coupling member on each of its ends and, as a result, a locomotive may be placed at either end of the train thereby eliminating the necessity of using complicated switching train yard procedures and arrangements to accommodate a one-way train.

Fig. 4 illustrates additional advantages arising from the use of the type of single axle car above described in forming a consist of the type disclosed. In Fig. 4, two separated single axle cars **31** and **32** are shown in relation to one another for interconnection. Both of the cars **31** and **32** are provided with single wheel-carrying axles near one of the ends thereof as evidenced by the schematically shown wheels **33**. The cars **31** and **32**, as illustrated, are provided at their coupler-supported ends with a suitable type of female coupling member **34** which is provided with a centrally recessed portion **35** adapted to receive the male tongue **36** of a male coupling member **37** attached to the wheel-supported ends of each of the cars **31** and **32**. The tongues **36** are mounted to the frames of the car bodies by any suitable means such as bolts **38** which are received through an aperture in one end of the tongues **36** and which further allow the tongues **36** to move laterally in an arcuate manner with respect to the frame of the car. The tongues **36** are received within the recess **35** of the female coupling member **34** and are attached to the female coupling member **34** by an insertable bolt **39**, or any other suitable means, received through an aperture in the tongue **36** to allow articulated movement between the respective cars for the negotiation of roadbed curves.

While the standardization of the single axle cars allows the use of simplified coupling means such as the male and female variety, further simplifications are obtained such as in the electrical connections made between interconnected cars. As an example of this, Fig. 4 schemati-

cally illustrates a simplified form of electrical connecting means which may be used in the manufacture of the cars 31 and 32. The car 32, at its wheel-supported end near the top central portion thereof carries an electrical connector 40 of the male plug variety. The coupler-supported end of car 32 is provided with a female type connector 41 which is connected to the wiring system of the car 32 by cables 42. Similarly the wheel-supported end of the car 31 carries a male type electrical connector 40. The cables 42 are provided with sufficient slack so as to allow movement of the female connectors 41 toward the adjacent end of interconnected cars. The male electrical connectors 40 may be permanently secured to the ends of the car bodies and upon the interconnection of the cars 31 and 32 by means of the male and female coupling members 37 and 34, an interconnection of the electrical system of the two cars may also be brought about by connection of the male and female electrical connectors 40 and 41.

The important aspects of the above described feature reside in the great simplification of the electrical systems of the interconnected cars. The cars 31 and 32 are designed in such a manner that they may be interconnected only at specified ends thereof. As these cars are single axle cars, it is necessary to connect a coupler-supported end of the car 32 to the wheel-supported end of the car 31. This allows the use of male and female type coupling members as well as male and female type electrical connectors. As a result, the positive and negative wiring of one car is always properly interconnected with the positive and negative wiring of an adjacent car. There is no danger of improperly interconnecting the wiring systems of the cars nor is it necessary to utilize special skill to establish the connection between cars. To further this last mentioned purpose, the electrical connectors 40 and 41 may be of any known type which are provided with means to insure proper aligning of the members such as a spaced tongue 43 to bring about proper interconnection between the positive and negative lead tongues 44 without relying on the use of skilled personnel. Under such circumstances, no special care need be taken in interconnecting two single axle cars as the connections with respect to the coupling members and the electrical connectors may only be made in a specified manner. While these advantages are present, it should also be borne in mind that the over-all utility of the single axle cars designed in conformance with the principles of the present invention is not at all reduced as each of these cars may be connected at either ends of the train as described in connection with Figs. 1–3.

Under the arrangement described with respect to the electrical connectors carried by the single axle cars, the double axle cars used in the consist must be provided at each of their ends with the same type of electrical connector. The coupler-supported ends of the two single axle cars connected to the ends of the double axle car may carry female connectors 41, as illustrated in Fig. 4. Therefore, the ends of the double axle car must each carry a male connector 40. By the foregoing arrangement it may be readily apparent that each end of each car in the consist may carry the same type of coupling member and electrical connector of either the male or female variety. However, this arrangement may be reversed as long as the variation is consistent throughout the consist.

While the above advantage of standardization has dealt solely with the electrical system of the consist, it should be understood that all utilities used in operation of the consist may be interconnected between each of the cars in the same manner if desired. By utilizing mating coupling members in this manner, inter-car connections of utility lines will always be properly made. Furthermore, it is possible to reduce the number of utility sources in the consist particularly with respect to the electrical system. In conventional equipment it is often the case that each car carries its own sources of many of the utilities thereby maintaining substantially complete independence between cars. The train consist of the present invention is particularly adapted for utilizing a central source of utilities which will normally be located in the locomotive and may be capable of servicing the entire consist. To avoid complicated wiring and further allow the double axle car to be positioned at any point in the consist including one of the ends thereof, the utility station located in the locomotive may be designed to service the cars intermediate the locomotive and the double axle car. The last car of the consist, which might be a locomotive or an observation car as shown in Figs. 5 and 6, may be provided with a utility station which services all of the cars from the end of the consist to the double axle car. The latter instance, of course, would apply where the double axle car is positioned toward the center of the consist. Either of these stations may also service the double axle car. By utilizing two separate utility stations in this manner, each of the stations will be of a reduced capacity as they service only one-half of the consist. A reduction in capacity of each station produces a savings in initial cost and maintenance.

Cars 31 and 32 of Fig. 4, at the coupler-supported ends thereof, are provided with diaphragms 45 for use in providing a protective enclosure to the passageways between interconnected cars. The diaphragm 45 of car 32 is partially broken away to fully illustrate the electrical connector 41. As previously mentioned, due to the design of the single axle cars, these cars can be interconnected with one another in only one relation, namely, a coupler-supported end connected to a wheel-supported end. As a result, it is unnecessary for each end of a single axle car to carry a section of diaphragm for cooperation with a section of diaphragm carried by an end of an adjacent car. For full efficient use of diaphragms it is preferred that a single diaphragm capable of being expanded to completely enclose the passageway between any two interconnected cars be carried by either the coupler-supported end or the wheel-supported end of the single axle car as long as the arrangement is consistently followed with respect to each car. Consequently, regardless of whether the single axle car is placed at the front of the train or the rear of the train, the diaphragm is in a position to be utilized. There is no waste of sectional diaphragms by non-use at either the exposed front end or rear end of a train consist.

Figs. 5–7 illustrate the adaptability of the use of standardized single axle cars in combination with a double axle car in forming different variations in train consists. In Fig. 5 a complete train 14 is illustrated as including a locomotive 46 leading a consist comprising two leading single axle cars 47, a double axle car 48, two following single axle cars 47 and an end locomotive 46. The double axle car 48 is provided with a male coupling member 49 at each of its ends interconnected with female coupling members 50 carried by the coupler-supported ends of adjacent single axle cars 47. Each of the single axle cars 47 is provided with a male coupling member 49 at its wheel-supported end and a female coupling member 50 at its coupler-supported end. The locomotives 46 are each provided with a female coupling member 50 interconnected with an exposed male coupling member 49 at each end of the consist. Fig. 5 illustrates the use of locomotives 46 connected at both ends of the consist and the train 14 is, as a result, bi-directional in operation.

Fig. 6 illustrates a modified train 15 which utilizes a leading locomotive 51 followed by two single axle cars 52, a double axle car 53, one single axle car 52 and an observation car 54. Male coupling members 55 and female coupling members 56 are arranged as previously described in connection with Fig. 5 and the observation

car 54 is provided with a female coupling member 56 similarly to the locomotive 51 to allow the same to be connected at either end of the consist.

The modified consist of Fig. 7 forms a train 16 which utilizes a locomotive 57, four single axle cars 58 and a double axle car 59 on the end of the consist. Male coupling members 60 and female coupling members 61 are arranged as previously described and the positioning of the double axle car 59 on the end of the consist further illustrates the many variations which may be resorted to in forming a train from the type of standardized cars of the present invention. The double axle car 59, being provided with male coupling members 60 at each of its ends, is fully adapted for use in any position within the consist including either of its ends. Regardless of the position of the double axle car 59, the consist will always be provided with similar exposed coupling members at its ends to allow interconnection with the power means for bi-directional operation.

In line with the advantages arising from standardization of car construction, the suspension systems utilized in each of the cars forming the consist of the present invention may be identical in construction. The suspension systems, of course, must be designed to compensate for a single axle car being placed in load-bearing relation with the wheel-supported end on an adjacent car. The single axles exposed at the ends of the consist are held in a compensating manner by the weight of a locomotive or observation car.

The single axle standardized car design above described results in many improvements in lightweight train construction. In considering the improvements which have been discussed above it should be clear that there is no danger of improperly interconnecting single axle cars to form a complete train nor is any inconvenience created by use of a single axle car of the type described with existing train yard facilities and train make-up procedures. Obviously, a shop-connected three-car unit of the type described in Fig. 3 is not necessary to form a complete train. All that is required is the use of a self-supported car somewhere in the consist to provide load-bearing support to adjacent single axle cars, the adjacent single axle cars in turn providing load-bearing support to additional single axle cars which may be used in any number and to any extent desired.

The shop-connected three-car units have been illustrated and described merely for the purpose of illustrating one form of train consist nucleus which may be commercially provided to railroads. However, it should be borne in mind that the self-supported car is alone sufficient to form the nucleus of a consist and that where the self-supported car is provided at each of its ends with the same type of coupling member and the single axle cars are standardized in construction, the articulated consist will be of such a nature that the power source or locomotive may be connected at either of its ends and any number of the standardized single axle cars may be added on to either of its ends without breaking up the continuity of the coupling arrangement.

While the male and female type coupling members have not been fully described in detail as to their structural features, it should be obvious that any suitable type of mating coupling members may be used. Although the male and female electrical connectors have been illustrated as being positioned near the top of the cars, it should be clear that they may be mounted in any desired position as long as they are capable of being properly interconnected. It should also be understood that the structural features of these connectors may be varied considerably and it is merely intended by the present invention to make use of a suitable type of male-female connector capable of functioning in the manner described. The principles of the present invention, particularly as described in connection with the electrical system, may still further be utilized with respect to the interconnection of air braking systems, ventilation systems, water systems and the like between cars, thereby greatly simplifying the operational interconnection of a plurality of cars. The body design including the interior design as well as the provision of entrances therein with respect to the double axle and single axle cars described does not form a part of the present invention and obviously any desired designs may be utilized. While the various elements of importance in forming a train consist incorporating the principles of the present invention have been shown schematically, it is considered to be well within the skill of the art to provide specific functional elements capable of carrying out the objects of the present invention.

Obviously many modifications and variations of the invention as hereinbefore set forth may be made without departing from the spirit and scope thereof, and therefore only such limitations should be imposed as are indicated in the appended claims.

We claim:

1. A train consist including a plurality of cars interconnected by mating coupling members separately carried by adjacent cars, one of said cars being self-supported and being provided at each of its ends with corresponding coupling members, the remainder of said cars each being self-supported at only one of the ends thereof, the remaining ends of said last mentioned cars being coupler-supported ends provided with coupling members adapted for mating with the coupling members carried by said first mentioned car, the self-supported ends of said last mentioned cars being provided with coupling members of the type carried by said first mentioned car for coupling in load-bearing relation with a coupler-supported end of a similar car.

2. A train consist including a plurality of cars interconnected by mating male and female load-transmitting coupling members separately carried by adjacent cars, one of said cars being self-supported and being provided at each of its ends with a male coupling member, the remainder of said cars each being self-supported at only one of the ends thereof, the remaining ends of said last mentioned cars being coupler-supported ends provided with female coupling members adapted for mating with the male coupling members carried by said first mentioned car, the self-supported ends of said last mentioned cars being provided with male coupling members of the type carried by said first mentioned car for coupling in load-bearing relation with a coupler-supported end of a similar car.

3. A train consist including a plurality of cars interconnected by mating male and female load-transmitting coupling members separately carried by adjacent cars, one of said cars being self-supported and being provided at each of its ends with corresponding female coupling members, the remainder of said cars each being self-supported at only one of the ends thereof, the remaining ends of said last mentioned cars being coupler-supported ends provided with male coupling members adapted for mating with the female coupling members carried by said first mentioned car, the self-supported ends of said last mentioned cars being provided with female coupling members of the type carried by said first mentioned car for coupling in load-bearing relation with a coupler-supported end of a similar car.

4. A train consist comprising a double axle car having an axle positioned near each of the ends thereof, and a plurality of single axle cars each having its axle positioned near an end thereof, said cars being interconnected by cooperating mating male and female load-transmitting coupling members in coupler-supported relation, said double axle car being provided at each of its ends with the same type of coupling member, said single axle cars being of a standardized construction to allow use of the same on either end of said double axle car and each being provided at the coupler-supported end with a type of coupling member adapted to cooperate with the coup-

ling members carried by said double axle car and at the axle-supported end thereof with an opposite mating type of coupling member.

5. A train consist comprising a double axle car having an axle positioned near each of the ends thereof, and a plurality of single axle cars each having its axle positioned near an end thereof, said cars being interconnected by cooperating mating male and female load-transmitting coupling members in coupler-supported relation, said double axle car being provided at each of its ends with a male coupling member, said single axle cars being of a standardized construction to allow use of the same on either end of said double axle car and each being provided at the coupler-supported end with a female coupling member adapted to cooperate with the male coupling members carried by said double axle car and at the axle-supported end with a male coupling member.

6. A train consist comprising a double axle car having an axle positioned near each of the ends thereof, and a plurality of single axle cars each having its axle positioned near an end thereof, said cars being interconnected by cooperating mating male and female load-transmitting coupling members in coupler-supported relation, said double axle car being provided at each of its ends with a female coupling member, said single axle cars being of a standardized construction to allow use of the same on either end of said double axle car and each being provided at the coupler-supported end with a male coupling member adapted to cooperate with the female coupling members carried by said double axle car and at the axle-supported end with a female coupling member.

7. A train consist comprising a three-car unit in combination with at least one single car, said unit including a center car provided with means for independent support and end cars connected to opposite ends of said center car and at least partially dependent on said center car for support, the exposed opposite ends of said unit being provided with similar coupling members adapted for mating in load-bearing relation with cooperating coupling members, said single car being self-supported only near one end thereof which end carries a coupling member similar to those carried by the exposed opposite ends of said unit, and a cooperating coupling member carried by the other end of said single car in mating and load-bearing relation with the coupling member carried by an end of said unit.

8. A train consist comprising a three-car unit in combination with at least one single car, said unit including a center car provided with means for independent support and end cars connected to opposite ends of said center car and at least partially dependent on said center car for support, the exposed opposite ends of said unit being provided with male coupling members adapted for mating in load-bearing relation with cooperating female coupling members, said single car being self-supported only near one end thereof which end carries a male coupling member similar to those carried by the exposed opposite ends of said unit, and a female coupling member carried by the other end of said single car in mating and load-bearing relation with the male coupling member carried by an end of said unit.

9. A train consist comprising a three-car unit in combination with at least one single car, said unit including a center car provided with means for independent support and end cars connected to opposite ends of said center car and at least partially dependent on said center car for support, the exposed opposite ends of said unit being provided with female coupling members adapted for mating in load-bearing relation with cooperating male coupling members, said single car being self-supported only near one end thereof which end carries a female coupling member similar to those carried by the exposed opposite ends of said unit, and a male coupling member carried by the other end of said single car in mating and load-bearing relation with the female coupling member carried by an end of said unit.

10. A train consist comprising a three-car unit in combination with at least one single car, said unit including a center car provided with means for independent support and end cars substantially permanently connected to opposite ends of said center car and at least partially dependent on said center car for support, the exposed opposite ends of said unit being provided with similar coupling members adapted for mating in load-bearing relation with cooperating coupling members, said single car being self-supported only near one end thereof which end carries a coupling member similar to those carried by the exposed opposite ends of said unit, and a cooperating coupling member carried by the other end of said single car in mating and load-bearing relation with the coupling member carried by an end of said unit.

11. A train consist including a plurality of cars interconnected by mating car and utility supply coupling members separately carried by adjacent cars, one of said cars being wheel-supported at each of its ends and being provided at each of its ends with corresponding coupling members, the remainder of said cars each being wheel-supported at only one of the ends thereof, the remaining ends of said last mentioned cars being coupler-supported ends provided with coupling members adapted for mating with the coupling members carried by said first mentioned car, the wheel-supported ends of said last mentioned cars being provided with coupling members of the type carried by said first mentioned car and each being adapted for coupling with a coupler-supported end of a similar car, said car coupling members being connected in load-bearing relation.

12. A train consist including a plurality of cars interconnected by mating coupling members separately carried by adjacent cars, one of said cars being wheel-supported at each of its ends and being provided at each of its ends with corresponding coupling members, the remainder of said cars each being wheel-supported at only one of the ends thereof, the remaining ends of said last mentioned cars being coupler-supported provided with coupling members adapted for mating with the coupling members carried by said first mentioned car, said coupler-supported ends further being solely provided with intercar passageway enclosing means, the wheel-supported ends of said last mentioned cars being provided with coupling members of the type carried by said first mentioned car and each being adapted for coupling in load-bearing relation with a coupler-supported end of a similar car.

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