Nov. 19, 1940. H. E. MOORE ET AL 2,222,086

BUILDERS' MATERIAL CONVEYANCE

Filed Aug. 12, 1938 3 Sheets-Sheet 1

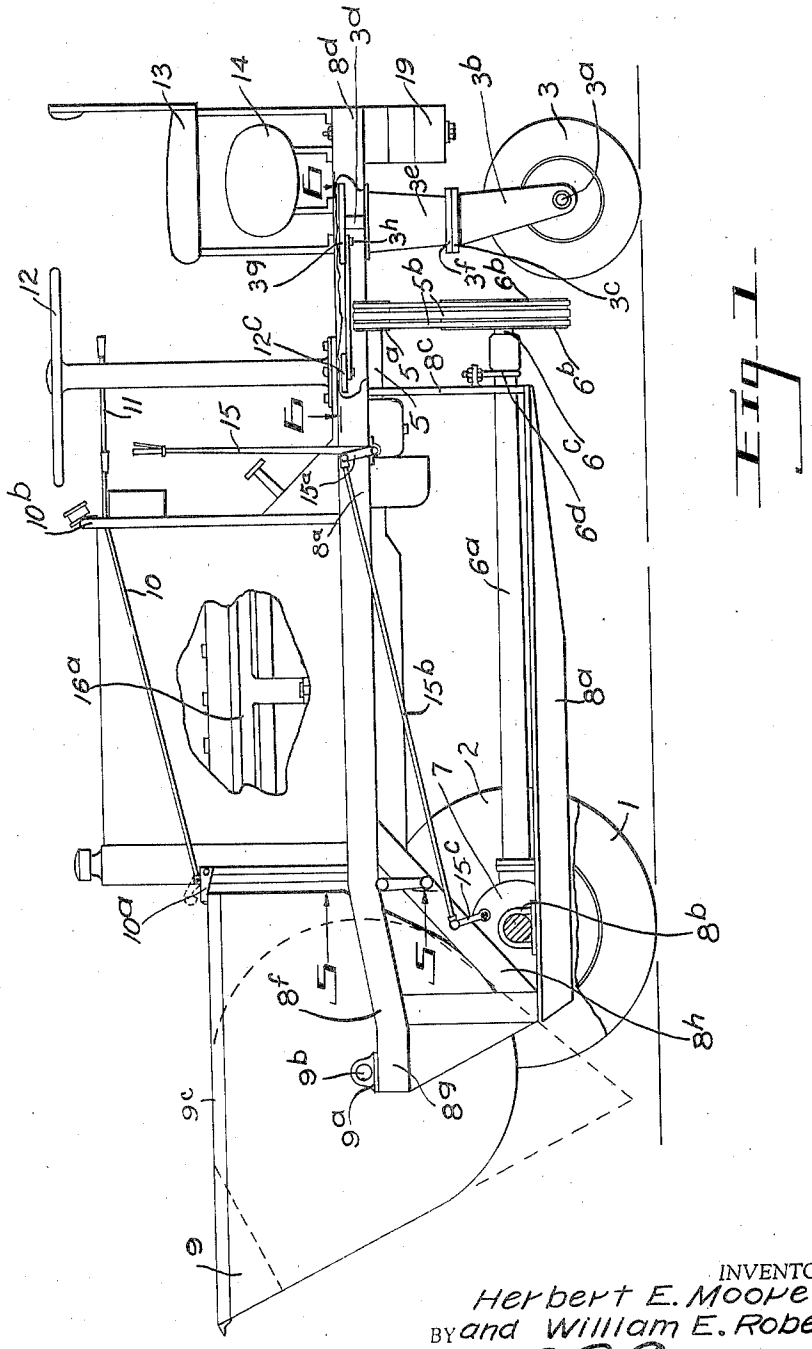


Fig. 1

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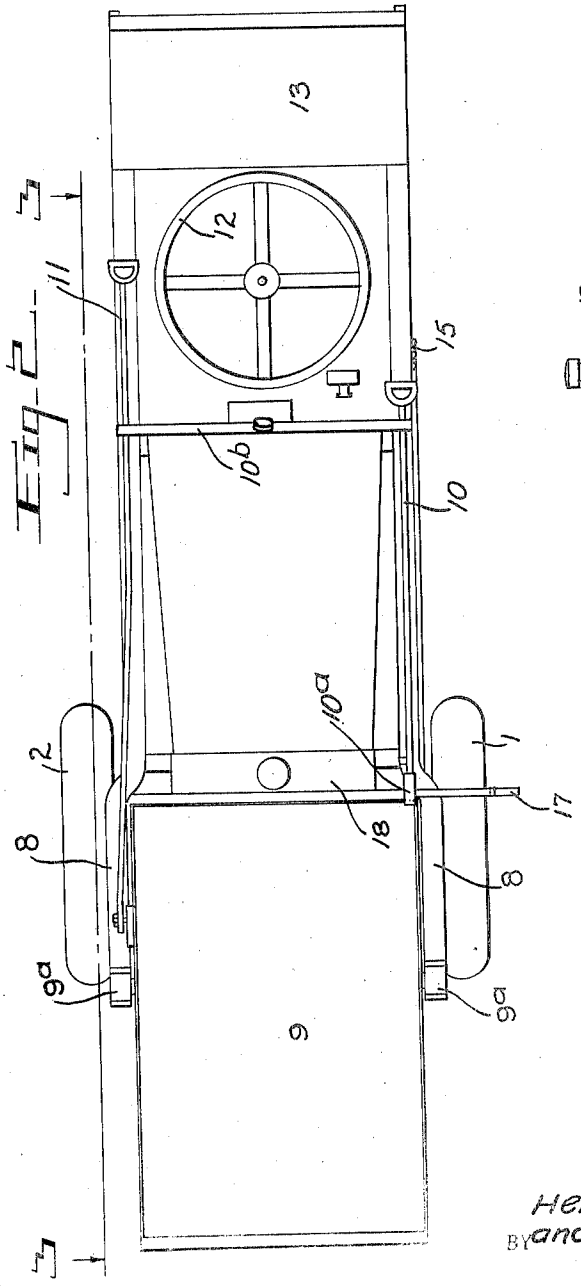


Fig. 2

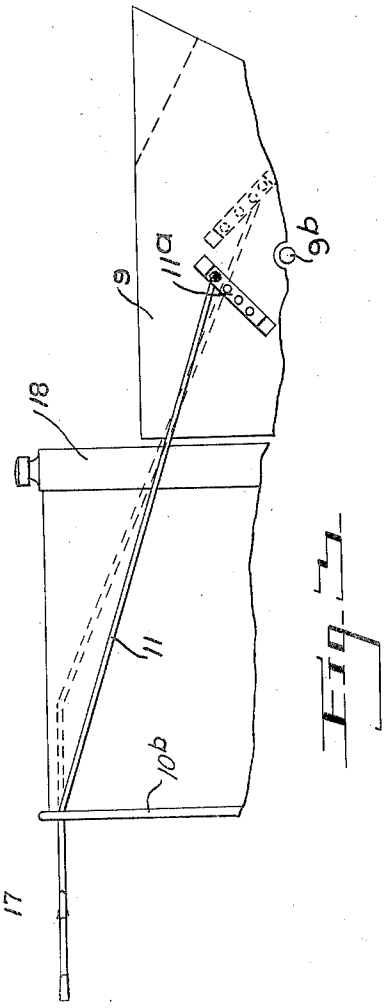


Fig. 3

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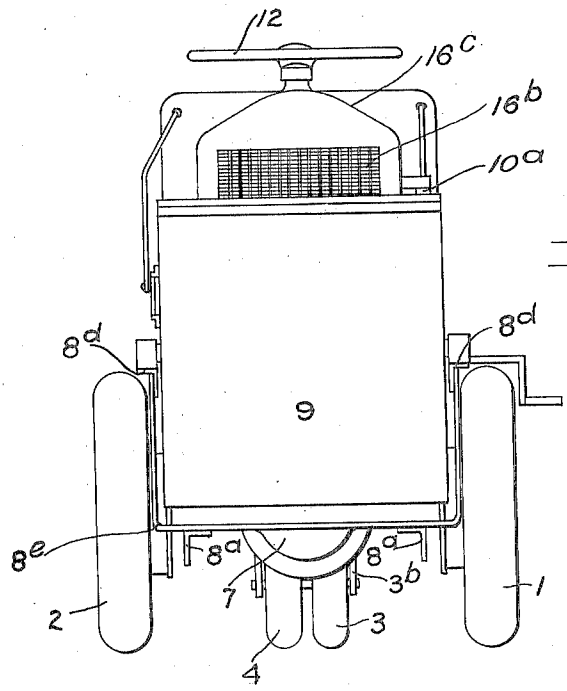


Fig. 4

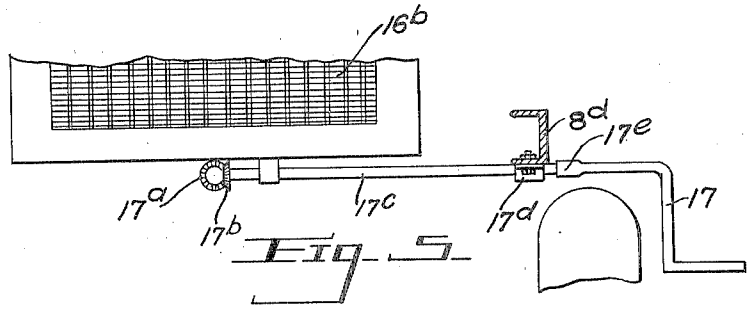


Fig. 5

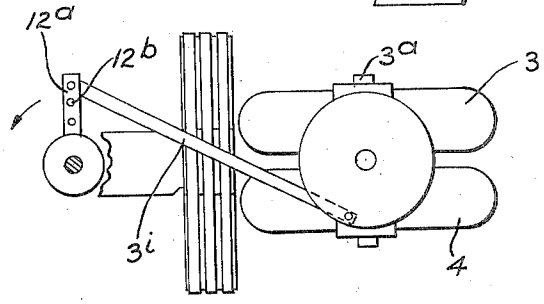


Fig 6

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BUILDERS' MATERIAL CONVEYANCE

Herbert E. Moore and William E. Roberts, San Diego, Calif., assignors to Charles L. Hoskins, San Diego, Calif.

Application August 12, 1938, Serial No. 224,537

12 Claims. (Cl. 180—1)

Our invention relates to a conveyance for conveying builders' material particularly adapted for conveying sand, gravel, cement or the like from place to place, particularly adapted for large building construction and the objects of our invention are:

First, to provide a conveyance of this class with a tiltable hopper positioned on the front end of the conveyance;

Second, to provide a conveyance of this class which is very short and compact and easily turned in very short space;

Third, to provide a conveyance of this class which is narrow and can be operated through doorways or narrow places;

Fourth, to provide a conveyance of this class which may be operated on ramps or relatively steep inclines;

Fifth, to provide a conveyance of this class which is easily steered for either forward or backward movement;

Sixth, to provide a conveyance of this class with several forward speeds and with a reverse;

Seventh, to provide a conveyance of this class in which the hopper may be dumped or returned to its upright position from the driver's seat of the conveyance;

Eighth, to provide a conveyance of this class in which an ordinary or conventional engine and transmission may be used for producing the power and transmitting the same;

Ninth, to provide a conveyance of this class which is easy to control;

Tenth, to provide a new and novel conveyance of this class; and

Eleventh, to provide a conveyance of this class which is very simple and economical of construction, easy to operate, efficient in its action and which will not readily deteriorate and get out of order.

With these and other objects in view as will appear hereinafter, our invention consists of certain novel features of construction, combination and arrangement of parts and portions as will be hereinafter described in detail and particularly set forth in the appended claims, reference being had to the accompanying drawings, and to the characters of reference thereon which form a part of this application in which:

Figure 1 is a side elevational view of our building material conveyance showing the hopper in upright position in solid lines and showing it in dump position by dotted line and showing portions broken away to facilitate the illustration; Fig. 2 is a top or plan view of our conveyance complete; Fig. 3 a fragmentary side elevational view showing the hopper control mechanism in varying positions by solid and dash lines; Fig. 4 is a front elevational view of our conveyance; Fig. 5 is an enlarged sectional view taken from the line 5—5 of Fig. 1; and Fig. 6 is an enlarged sectional view taken from the line 6—6 of Fig. 1.

Similar characters of reference refer to similar parts and portions throughout the several views of the drawings:

The traction wheels 1 and 2, caster wheels 3 and 4, engine drive shaft 5, wheel drive mechanism 6, differential casing 7, main supporting frame 8, hopper 9, hopper control rods 10 and 11, steering wheel 12, seat 13, fuel tank 14, brake lever 15, power plant 16, crank 17, radiator 18 and counterweights 19 constitute the principal parts and portions of our builders' material conveyance.

The wheels 1 and 2 are the conventional type of automobile rear wheels provided with heavy pneumatic tires to facilitate their operation on floors, ramps or the like in buildings. They are mounted on a conventional automobile rear axle with the conventional differential 7 and with a shaft casing 6*a* secured to the front portion of the differential in the conventional manner of construction of automobile rear axles, differential and main shaft housing. It will be here noted that the main bevel ring gear and differential casing are reversed so that they are on the opposite side of the driving pinion gear in the differential housing so that the wheels secured to the axles revolve in the reverse direction, and it will also be noted that the axles and axle housings are shortened to provide a substantially narrow space between the traction wheels.

Supported on the differential and axle casing 7 near the brakes of the wheels 1 and 2 are main supporting frame members 8*a* shown best in Figs. 1 and 4 of the drawings. They are supported by means of U-bolts 8*b* and their backward extending ends are supported by means of brace members 8*c* which are secured to and extend downwardly from the upper parallel frame members 8*d*. Mounted on the upper side of the forward end of the frame members 8*a* is a U-shaped frame member 8*e* and it will be here noted that this frame member 8*e* forms a stop for the lower side of the hopper 9 when it is tilted down in the position shown by dash line in Fig. 1 of the drawings. The upper opposite ends of the member 8*e* are secured to the members 8*d*. It will be here noted that these members 8*e* are each provided with a downwardly directed portion 8*f* and with a straight portion 8*g* upon which are mounted the

journal members 9a in which is journalled the shaft 9b on the opposite sides of the hopper 9 so that this hopper 9 is substantially balanced in tilting relation on the forward extending ends of the members 8d on the portions 8c as shown best in Fig. 1 of the drawings. This hopper 9 is substantially U-shaped in cross section and provided with a large open side 9c which is substantially horizontal when the hopper is not in dumping position, but assumes the position as shown by dash lines when it is being dumped.

Secured to the front ends of the members 8a and extending backwardly on an angle and upwardly and connecting with the frame members 8d are the frame brace members 8h. Mounted on the members 8d backwardly of the hopper member 9 is a power plant 16 which includes an engine 16a of any conventional type with radiator 18, hood 16c and transmission and clutch of conventional type which are positioned backwardly of the engine 16a from which extends the engine drive shaft 5 which extends backwardly some distance centrally between the members 8d and on the extended end of which are mounted pulleys 5a and aligning with these pulleys 5a are pulleys 6b which are connected by means of belts 5b. These pulleys 6b are secured on the shaft 6c which extends backwardly and connects with the rear axle through the differential as hereinbefore described through the shaft housing 6a. Thus the drive wheels 1 and 2 are operated by means of the engine 16a through the clutch and transmission of conventional type through the drive shaft 5, pulleys 5a, belt 5b, pulleys 6b, shaft 6c and through the differential and rear axle of conventional type through the wheels 1 and 2 in conventional manner. The casing 6a for the main shaft 6b is supported by means of an adjustable clip member 6d adjustably connected with the frame member 8d shown best in Fig. 1 of the drawings and serves for shifting the shaft 6a and tightening belts 5b.

The rear ends of the frame member 8d are supported by means of the caster wheels 3 and 4, there being two of these caster wheels preferably provided with pneumatic tires and positioned to revolve freely on a shaft 3a so that they may revolve in either direction independently of each other. The shaft 3a is secured on a bifurcated member 3b which is provided with a bearing member 3c at its upper end and with an upwardly extending shaft 3d which extends upwardly through a stationary hollow member 3e which is provided with a bearing portion 3f conforming to the bearing 3c on the member 3b. The members 8d are supported on the upper end of the member 3e the member 3b being swivelly mounted relatively to the member 3e.

Mounted on the upper end of the shaft 3b is a wheel 3g. This wheel 3g is provided with a pin 3h to which is pivotally connected a rod 3i, the other end of which is connected to an arm member 12a which is provided with a plurality of holes 12b for adjustment for receiving the end of the rod 3i. This arm 12a is connected with the shaft 12c to which the steering wheel 12 is connected, and thus the conveyance is steered by means of the steering wheel 12 through the shaft 12c, arm 12a, rod 3i, wheel 3g, shaft 3d bifurcated member 3b and wheels 3 and 4.

Mounted on a platform on the upper side of the members 8d at their rear ends is a seat member 13 for the operator. Positioned under the seat is the fuel tank 14 for furnishing fuel to the engine 16a in the conventional manner.

In order to prevent the loaded hopper from tilting the conveyance, there is provided a plurality of weights 19 positioned on the back end at the lower side of the members 8d and under the seat 13 adapted to provide a substantial counter balance for the loaded hopper.

In order to provide means for cranking the engine because of the position of the hopper, it is necessary to crank from the side. There is provided on the cranking portion of the engine a bevel gear 17a and connecting therewith is another bevel gear 17b which is secured on a shaft 17c. This shaft 17c and the bevel gear 17b operate at all times when the engine is running. The other end of this shaft 17c is journalled in a journal member 17d on one of the frame members 8d, all shown best in Fig. 5 of the drawings. The extended end of this shaft 17d is polygon shaped and is adapted to receive a conforming end 17e upon the end of the crank member 17. This crank member 17 is provided with long enough shank so that it extends over the wheel 1.

In order to provide a means for tilting the hopper 9, and supporting it in upright position, it is shaped so that it tends to tilt forward as shown in dash line position in Fig. 1, but is held in solid line position by a latch 10a which engages the inner side of the back side of the hopper and there are provided hopper control rods 10 and 11 shown best in Figs. 2 and 3 of the drawings. The rod 10 operates the latch 10a for releasing the hopper 9 and it tilts forwardly. The hopper is provided with an arm member 11a on one side which is provided with a plurality of holes for adjustable connection with the extended end of the control rod 11 and this rod is shiftably mounted through the dash 10b and is provided with a handle at its extended end adapted to be grasped by the operator of the conveyance for shifting the hopper to upright position as desired from the seat 13.

In view of the fact that this conveyance is used on inclines and ramps and the like, there is provided means for braking the conveyance which includes a brake lever 15 which is pivotally connected to the lower side of one of the members 8d just in front of the steering wheel 12, which is provided with an arm 15a which is pivotally connected with a rod 15b which connects at its other end with the conventional brake arm 15c of the conventional brake for the traction wheels 1 and 2.

Though we have shown and described a particular construction, combination and arrangement of parts and portions, we do not wish to be limited to this particular construction, combination and arrangement, but desire to include in the scope of our invention the construction, combination and arrangement substantially as set forth in the appended claims.

Having thus described our invention, what we claim as new and desire to secure by Letters Patent is:

1. In an apparatus of the class described, the combination of a frame, a power plant positioned intermediate the ends of said frame provided with a drive shaft extending backwardly on said frame, a hopper pivotally mounted on said frame forwardly of and adjacent said power plant, traction wheels supporting said frame near its front end backwardly of said hopper provided with a drive shaft extending backwardly parallel with said power plant drive shaft, and pulley and belt drive mechanism connecting the shaft from said

power plant with the shaft of said traction wheels at their extended ends.

2. In an apparatus of the class described, the combination of a frame, a power plant positioned intermediate the ends of said frame provided with a drive shaft extending backwardly on said frame, a hopper pivotally mounted on said frame forwardly of and adjacent said power plant, traction wheels supporting said frame near its front end backwardly of said hopper provided with a drive shaft extending backwardly, parallel with said power plant drive shaft, pulley and belt drive mechanism connecting the shaft from said power plant with the shaft of said traction wheels at their extended ends, a caster wheel supporting said frame at its rear end and backwardly of said drive mechanism.

3. In an apparatus of the class described, the combination of a frame, a power plant positioned intermediate the ends of said frame provided with a drive shaft extending backwardly on said frame, a hopper pivotally mounted on said frame forwardly of and adjacent said power plant, traction wheels supporting said frame near its front end backwardly of said hopper provided with a drive shaft extending backwardly parallel with said power plant drive shaft, pulley and belt drive mechanism connecting the shaft from said power plant with the shaft of said traction wheels at their extended ends, a caster wheel supporting said frame at its rear end and backwardly of said drive mechanism, and steering and control mechanism in connection with said caster wheel rearwardly of said power plant.

4. In an apparatus of the class described, the combination of a frame, a power plant positioned intermediate the ends of said frame provided with a drive shaft extending backwardly on said frame, a hopper pivotally mounted on said frame forwardly of and adjacent said power plant, traction wheels supporting said frame near its front end backwardly of said hopper provided with a drive shaft extending backwardly parallel with said power plant drive shaft, pulley and belt drive mechanism connecting the shaft from said power plant with the shaft of said traction wheels at their extended ends, a caster wheel supporting said frame at its rear end and backwardly of said drive mechanism, steering and control mechanism in connection with said caster wheel rearwardly of said power plant, and means for tilting said hopper upon its pivotal mounting extending to the rear of said frame past said power plant.

5. In a building material conveyance of the class described, the combination of a frame including two substantially parallel spaced upper and lower horizontal portions, means for supporting said frame including front traction wheels mounted in connection with said lower frame portion, an axle housing, a differential housing and a main drive shaft extending rearwardly from said wheels and supported by said frame, an engine with a drive shaft extending backwardly parallel with the main drive shaft, means connecting said main drive shaft with the drive shaft of the engine, and a hopper pivotally supported substantially centrally on the upper portion of the front end of said frame forwardly of and adjacent the front axle of said wheels and differential housing.

6. In a building material conveyance of the class described, the combination of a frame including two substantially parallel spaced upper and lower horizontal portions, means for supporting said frame including front traction wheels mounted in connection with said lower frame portion, an axle housing, a differential housing and a main drive shaft extending rearwardly from said wheels and supported by said frame, an engine with a drive shaft extending backwardly parallel with the main drive shaft, means connecting said main drive shaft with the drive shaft of the engine, a hopper pivotally supported substantially centrally on the upper portion of the front end of said frame forwardly of and adjacent the front axle of said wheels and differential housing, and caster wheels positioned on the rear end of the upper portion of said frame backwardly of both of said shafts.

7. In a building material conveyance of the class described, the combination of a frame including two substantially parallel spaced upper and lower horizontal portions, means for supporting said frame including front traction wheels mounted in connection with said lower frame portion, an axle housing, a differential housing and a main drive shaft extending rearwardly from said wheels and supported by said frame, an engine with a drive shaft extending backwardly parallel with the main drive shaft, means connecting said main drive shaft with the drive shaft of the engine, a hopper pivotally supported substantially centrally on the upper portion of the front end of said frame forwardly of and adjacent the front axle of said wheels and differential housing, caster wheels positioned on the rear end of the upper portion of said frame backwardly of both of said shafts, and steering mechanism in connection with said caster wheels positioned intermediate said caster wheels and said engine.

8. In a building material conveyance of the class described, the combination of a frame including two substantially parallel spaced upper and lower horizontal portions, means for supporting said frame including front traction wheels mounted in connection with said lower frame portion, an axle housing, a differential housing and a main drive shaft extending rearwardly from said wheels and supported by said frame, an engine with a drive shaft extending backwardly parallel with the main drive shaft, means connecting said main drive shaft with the drive shaft of the engine, a hopper pivotally supported substantially centrally on the upper portion of the front end of said frame forwardly of and adjacent the front axle of said wheels and differential housing, caster wheels positioned on the rear end of the upper portion of said frame backwardly of both of said shafts, steering mechanism in connection with said caster wheels positioned intermediate said caster wheels and said engine, and hopper tilting means connected with said hopper and extending backwardly past said engine.

9. In a building material conveyance of the class described, the combination of a frame including two substantially parallel spaced upper and lower horizontal portions, means for supporting said frame including front traction wheels mounted in connection with said lower frame portion, an axle housing, a differential housing and a main drive shaft extending rearwardly from said wheels and supported by said frame, an engine with a drive shaft extending backwardly parallel with the main drive shaft, means connecting said main drive shaft with the drive shaft of the engine, a hopper pivotally

supported substantially centrally on the upper portion of the front end of said frame forwardly of and adjacent the front axle of said wheels and differential housing, caster wheels positioned on the rear end of the upper portion of said frame backwardly of both of said shafts, steering mechanism in connection with said caster wheels positioned intermediate said caster wheels and said engine, hopper tilting means connected with said hopper and extending backwardly past said engine, and means on the back end of the upper portion of said frame backwardly of said caster wheels for balancing the weight of the front portion of said frame and operating mechanism including the loaded hopper.

10. In a building material conveyance of the class described, the combination of a frame including spaced upper and lower horizontal frame portions and connecting portions at their front and rear ends, a pair of traction wheels arranged to support said frame near its front end positioned on the lower portion thereof, a hopper pivotally supported on the upper portion of said frame forwardly of the axes of said wheels and an engine positioned adjacent the rear side of said hopper and arranged to drive said wheels.

11. In a building material conveyance of the class described, the combination of a frame including spaced upper and lower horizontal frame portions and connecting portions at their front and rear ends, a pair of traction wheels arranged to support said frame near its front end positioned on the lower portion thereof, a hopper pivotally supported on the upper portion of said frame forwardly of the axes of said wheels, an engine positioned adjacent the rear side of said hopper and arranged to drive said wheels, and a separate drive shaft arranged in parallel relation with said engine and operatively connected with said wheels.

12. In a building material conveyance of the class described, the combination of a frame including spaced upper and lower horizontal frame portions and connecting portions at their front and rear ends, a pair of traction wheels arranged to support said frame near its front end positioned on the lower portion thereof, a hopper pivotally supported on the upper portion of said frame forwardly of the axes of said wheels, an engine positioned adjacent the rear side of said hopper and arranged to drive said wheels, a separate drive shaft arranged in parallel relation with said engine and operatively connected with said wheels, and a caster wheel arranged to support said frame near its rear end and conveyance operating control means intermediate said caster wheels and said engine.

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