No. 863,077. PATENTED AUG. 13, 1907.

J. B. MERWIN.

MINE CAR MOTOR.

APPLICATION FILED JULY 26, 1906.

4 SHEETS—SHEET 1.

Fig. 1

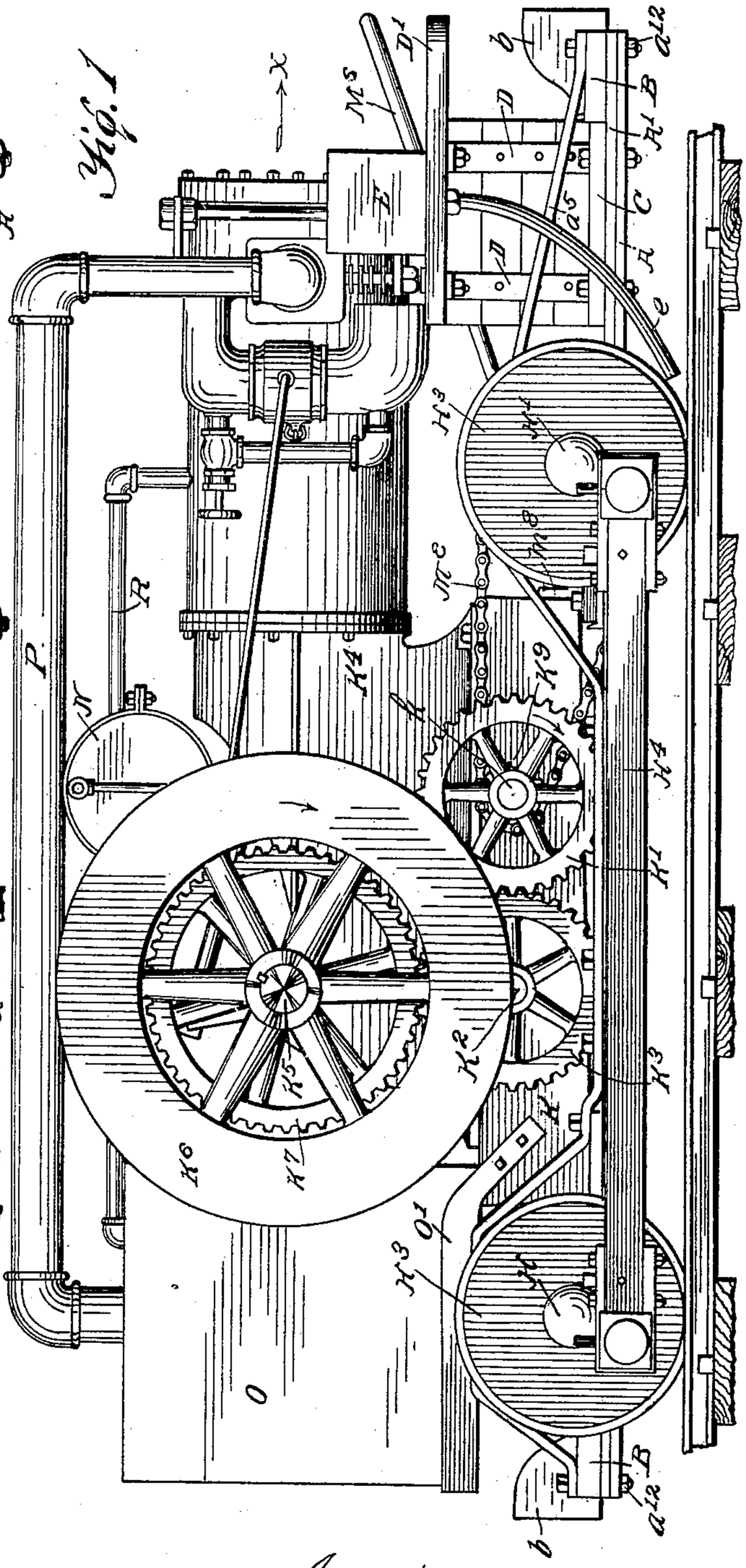


Fig. 2

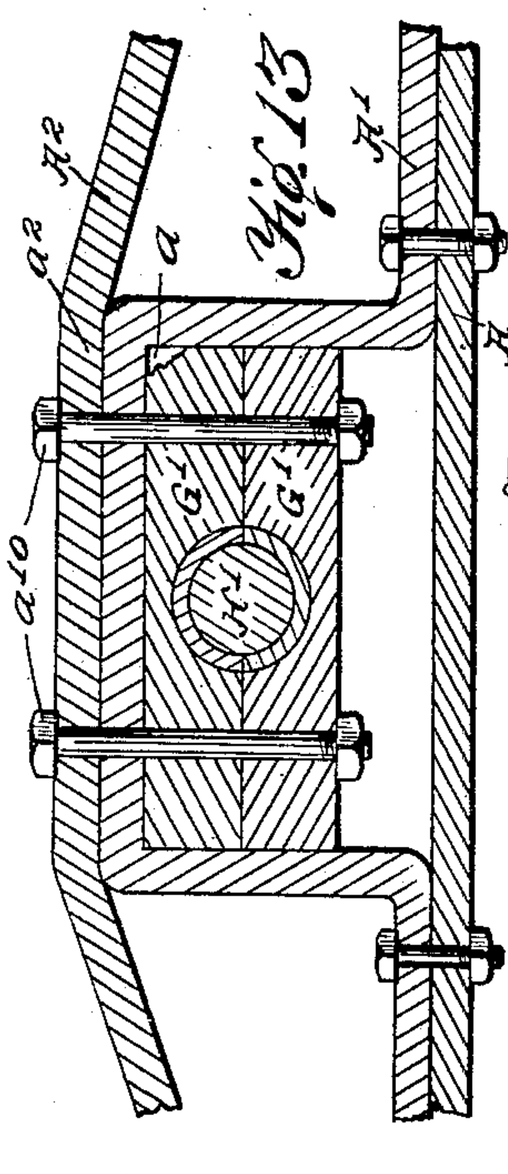
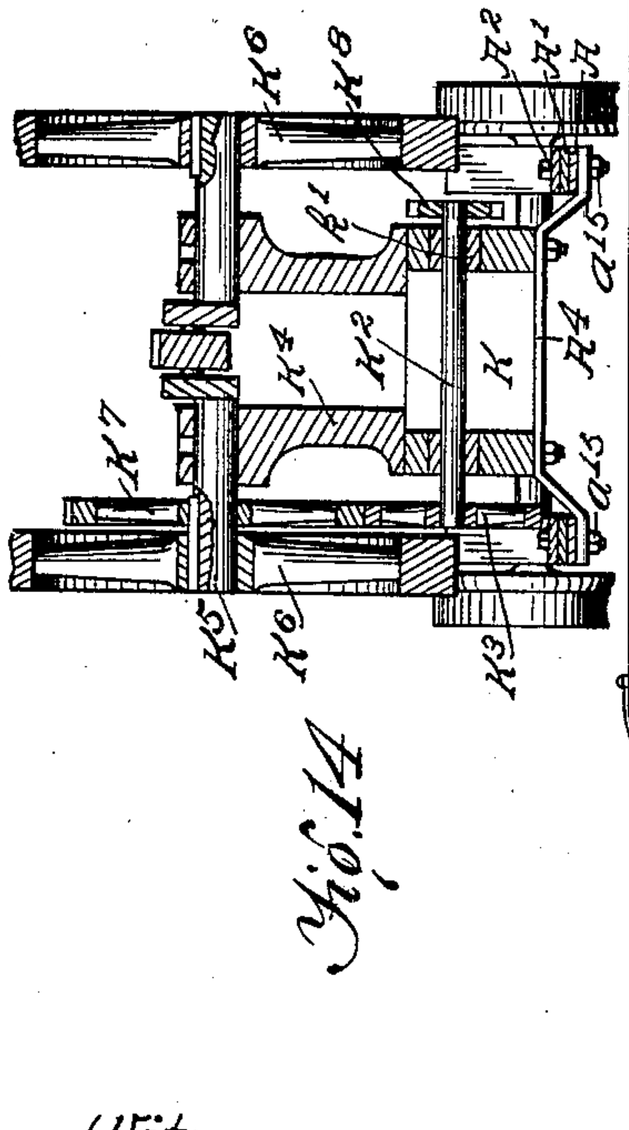


Fig. 3



Witnesses.
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E. H. Distelberg

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4 SHEETS—SHEET 2.

Fig. 2.

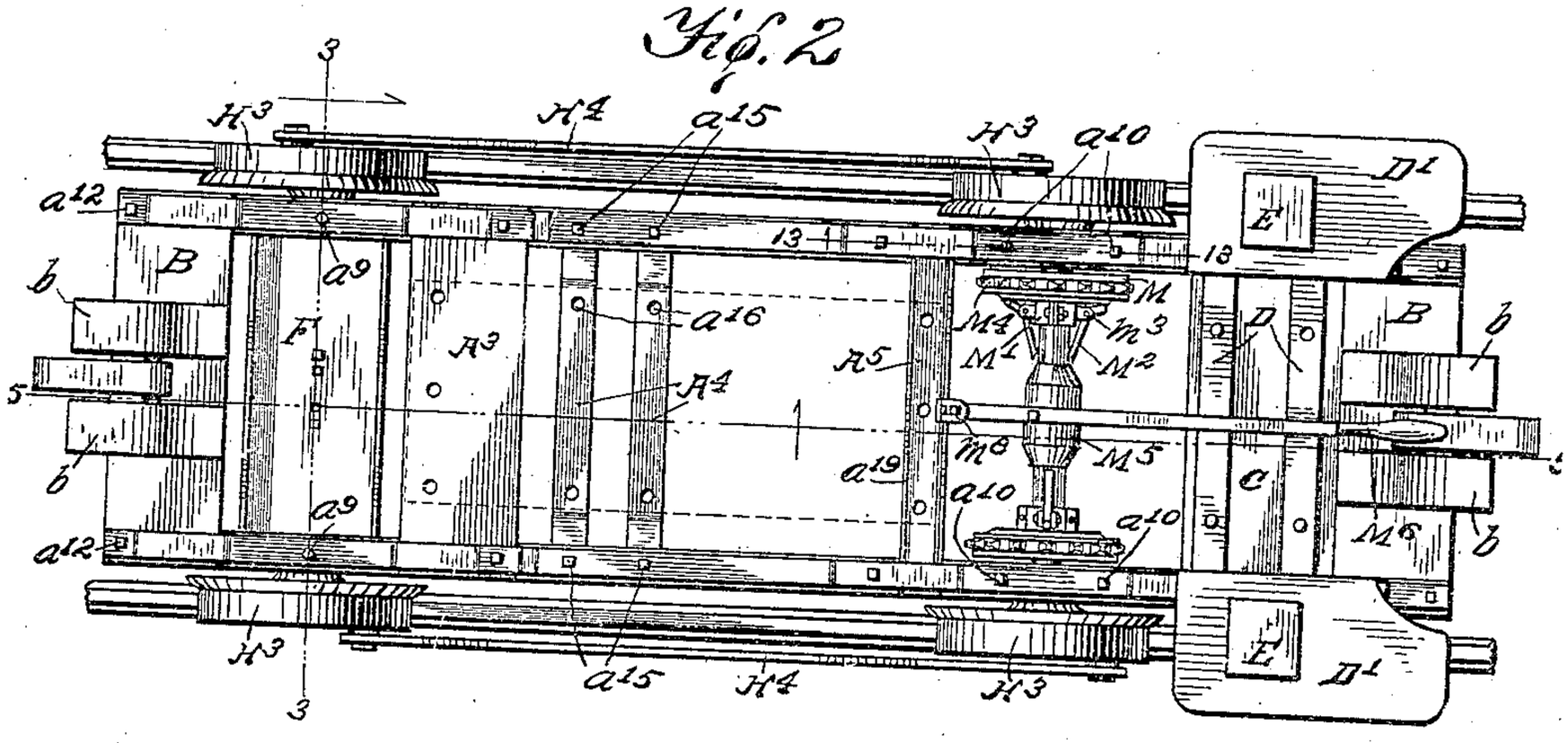


Fig. 6.

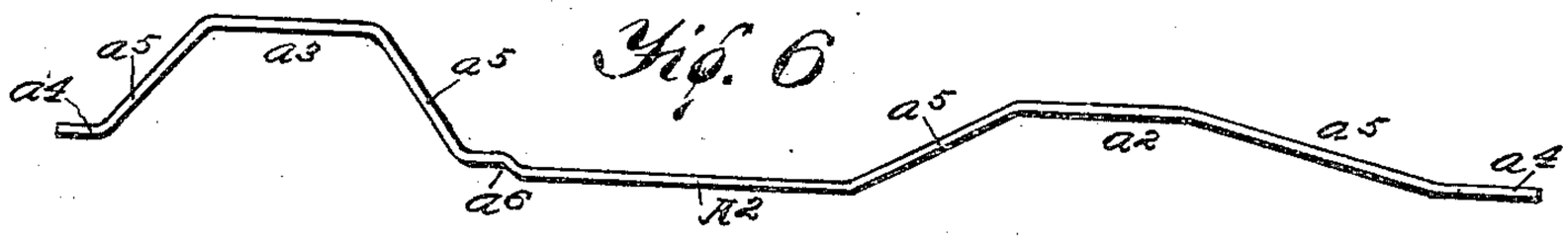


Fig. 7.

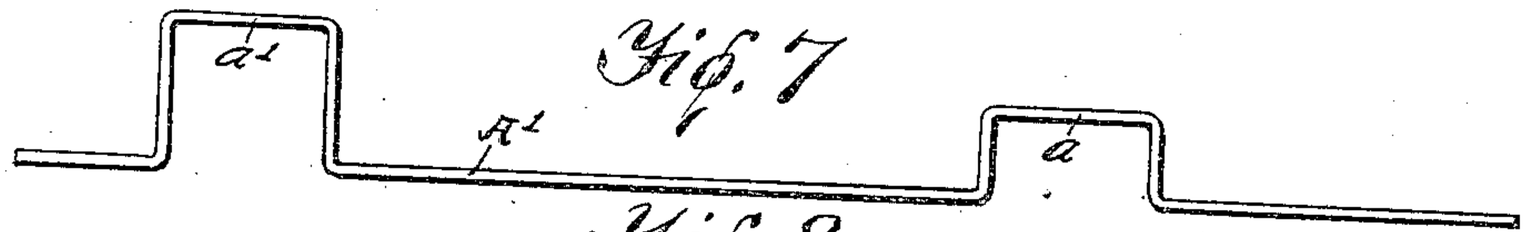
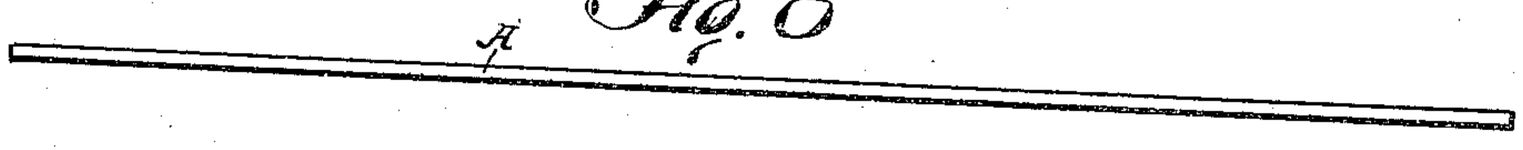


Fig. 8.



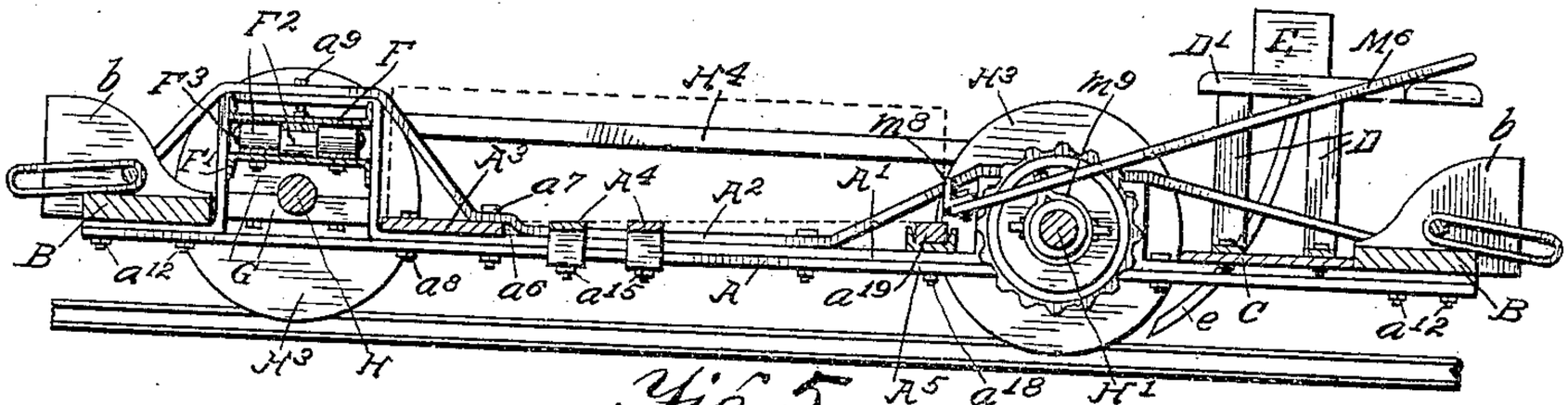


Fig. 5.

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MINE CAR MOTOR.

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4 SHEETS—SHEET 3.

Fig. 3.

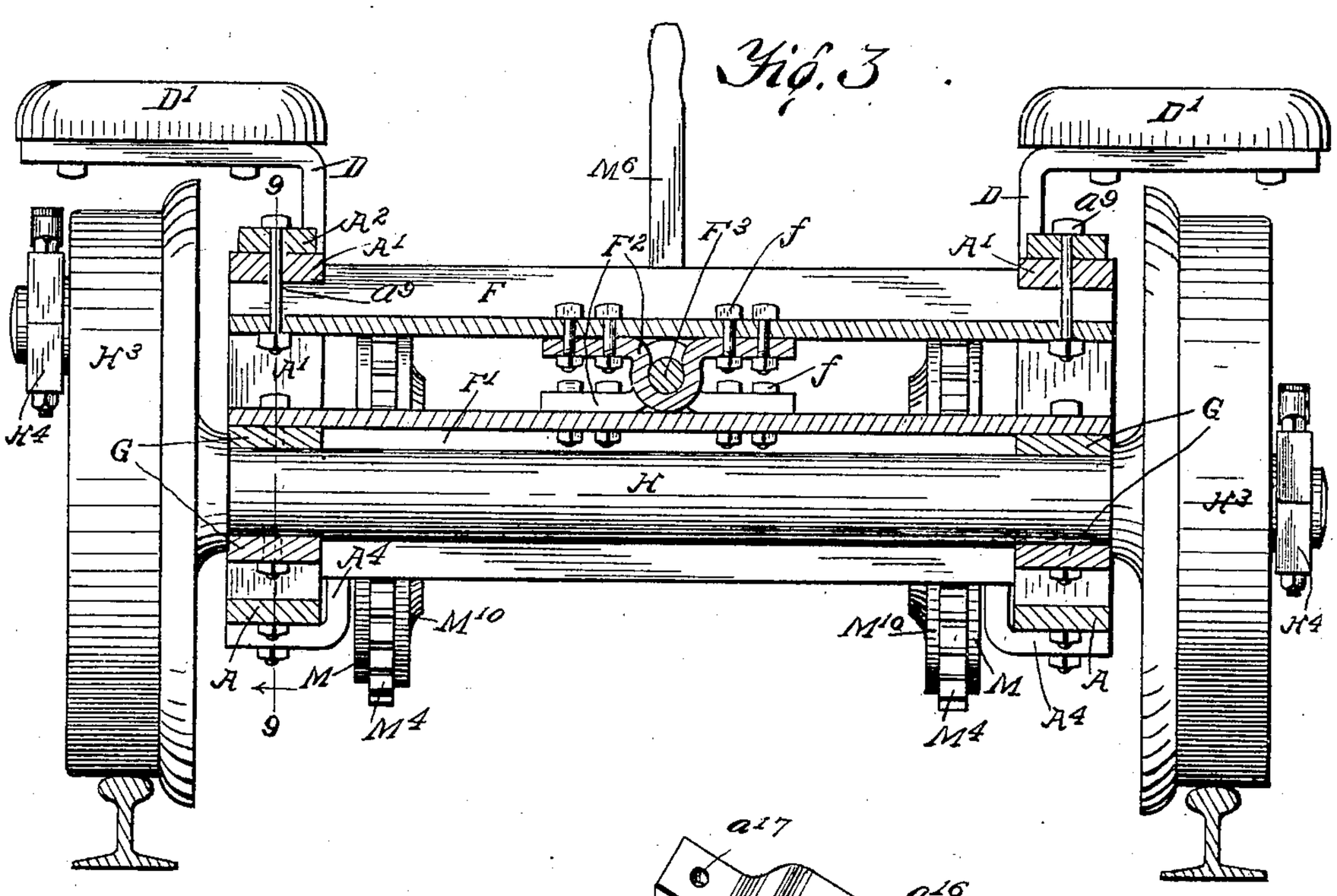


Fig. 10.

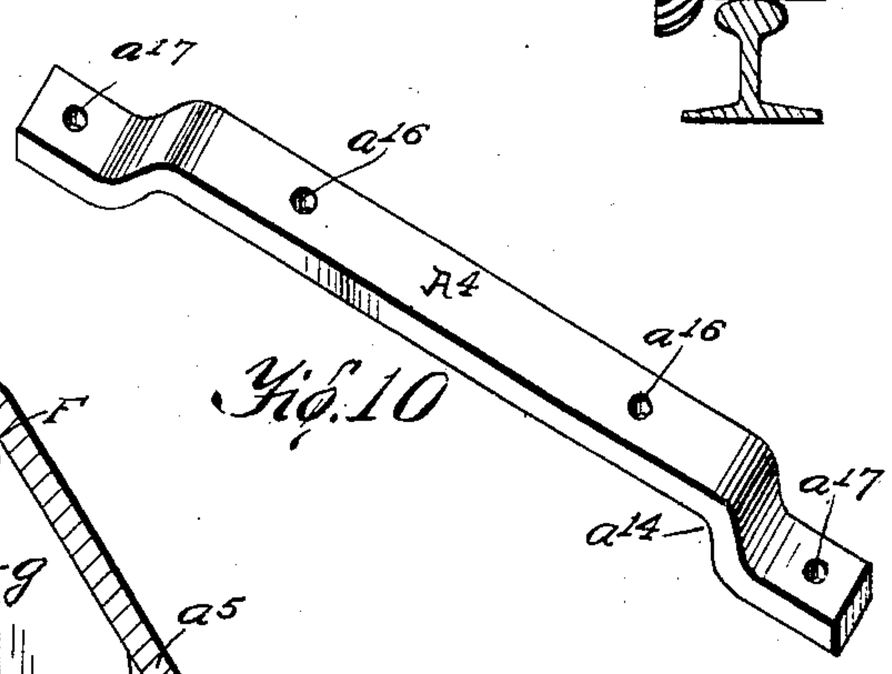
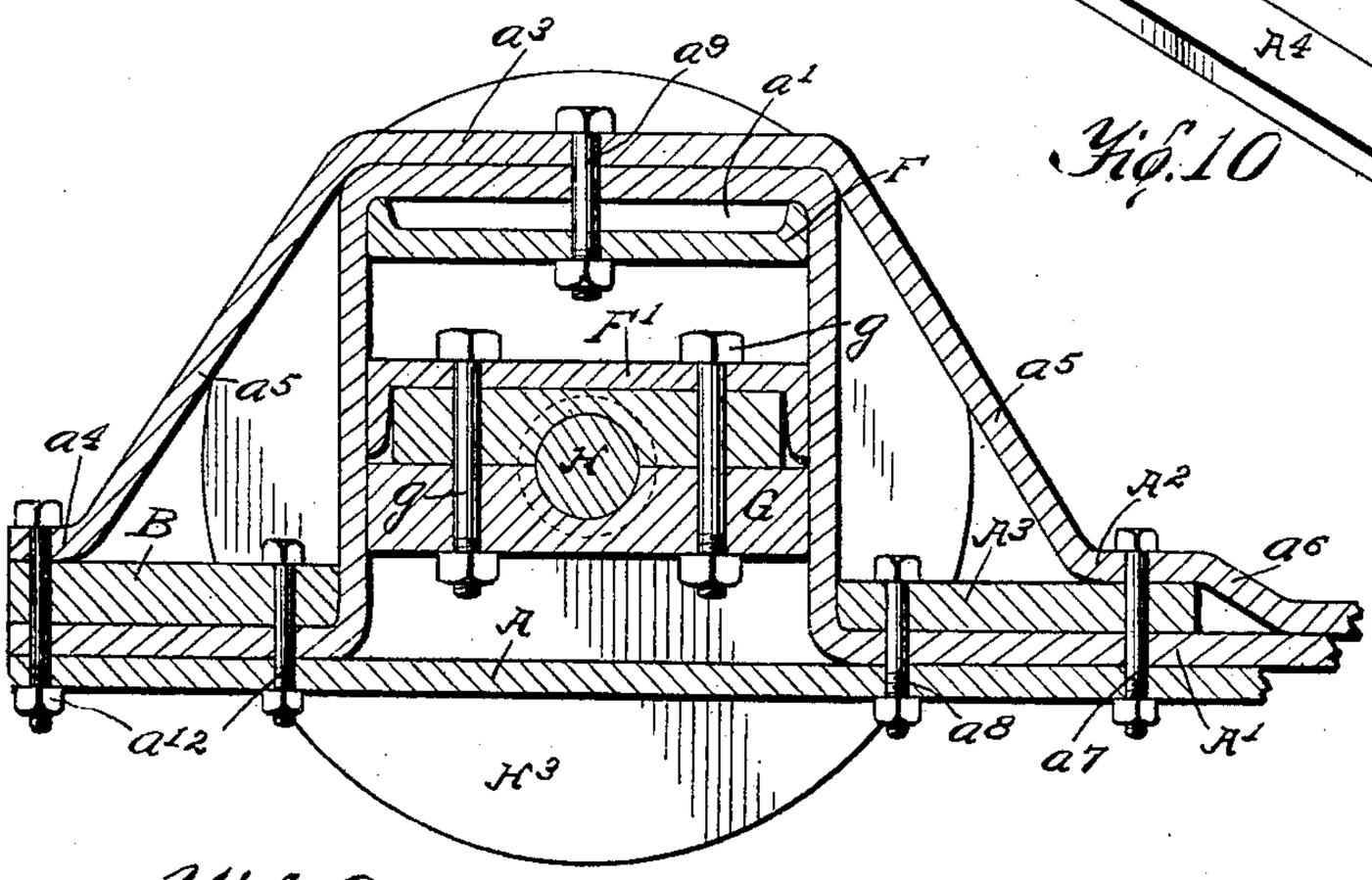


Fig. 9.



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No. 863,077. PATENTED AUG. 13, 1907.

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MINE CAR MOTOR.

APPLICATION FILED JULY 26, 1906.

4 SHEETS—SHEET 4.

Fig. 4

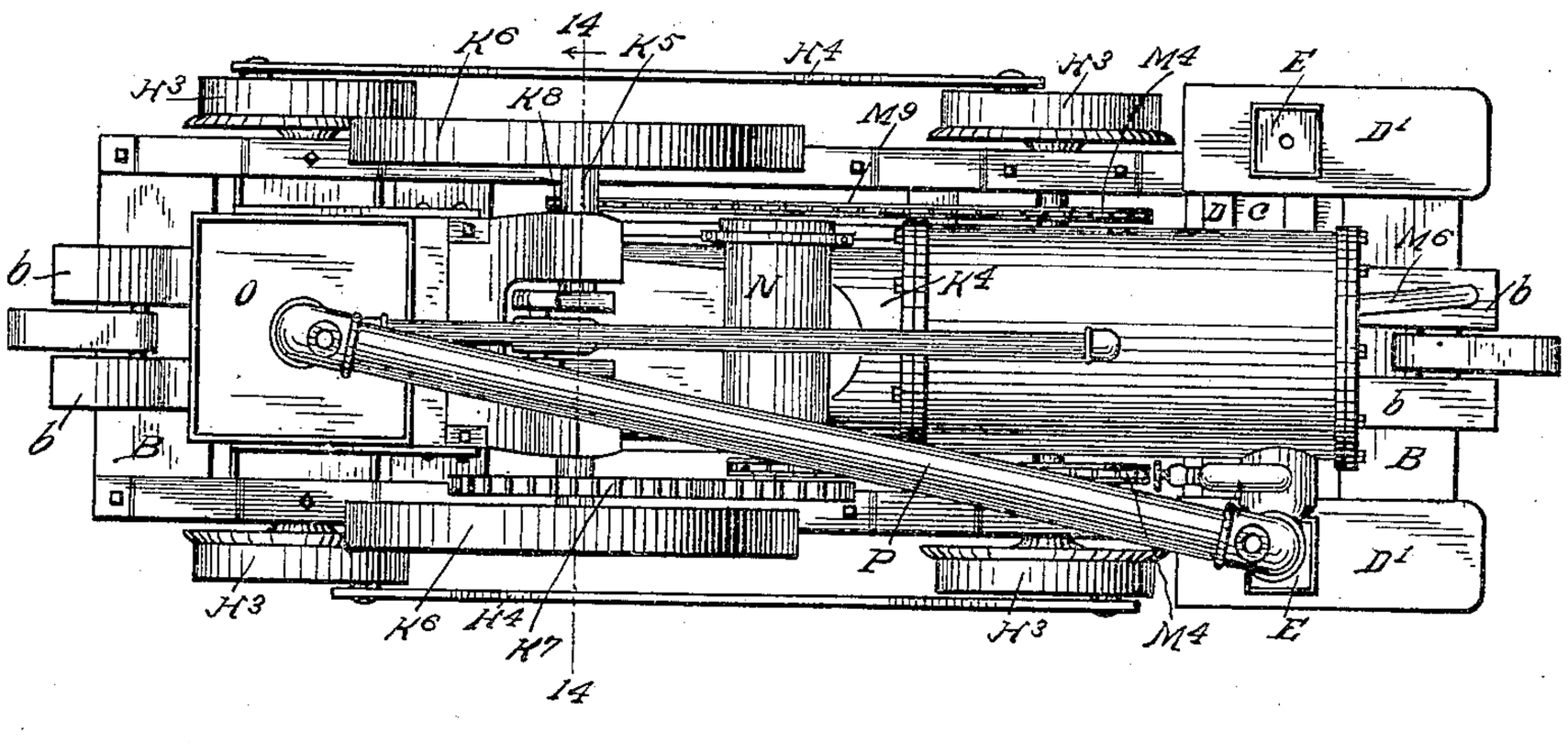


Fig. 11

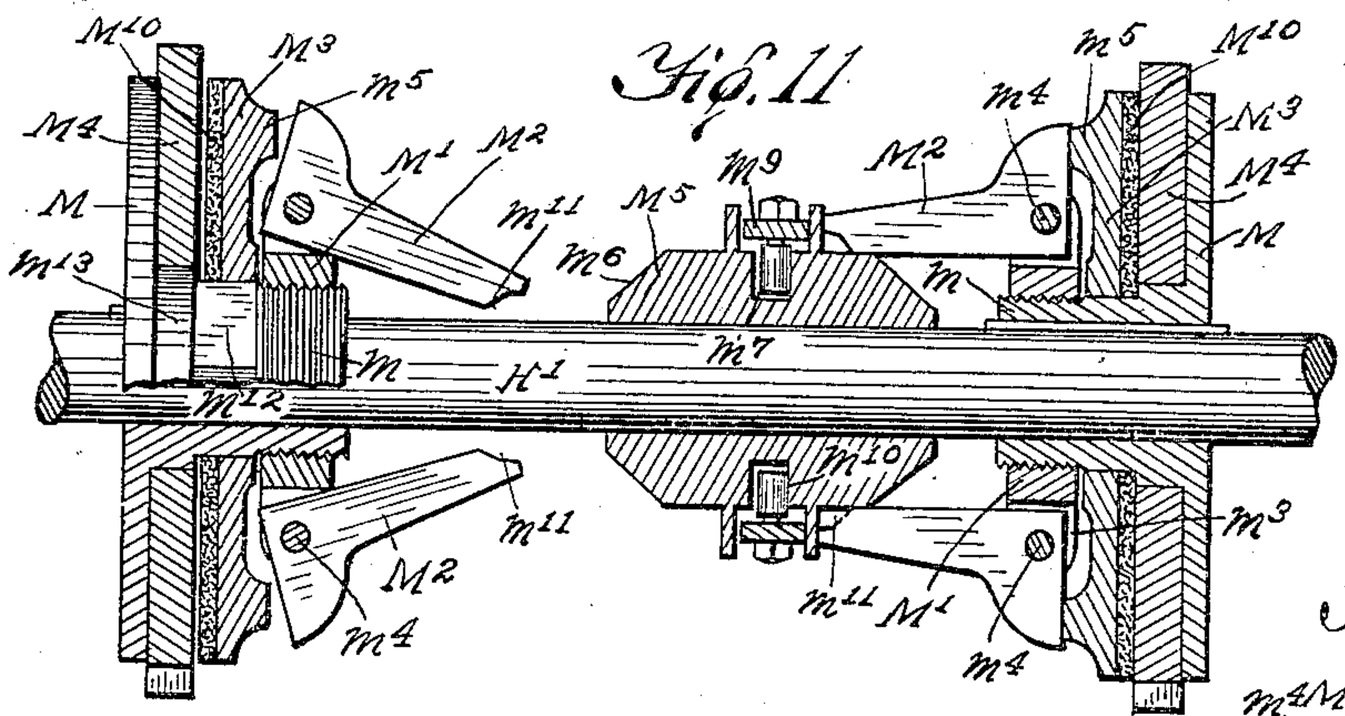


Fig. 15

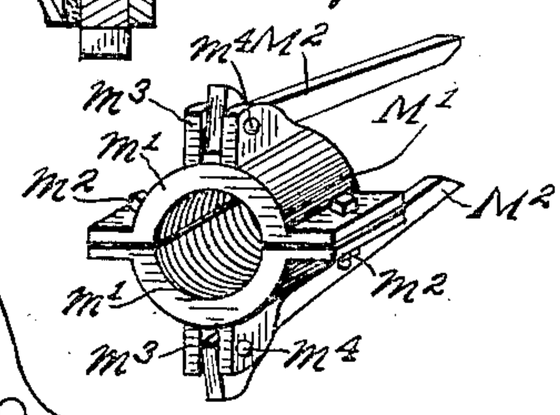
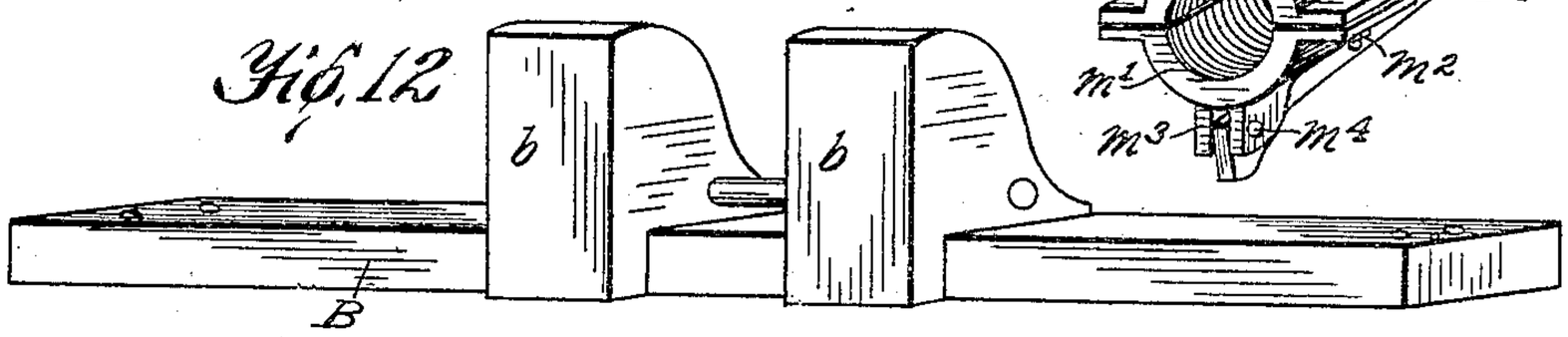


Fig. 12



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UNITED STATES PATENT OFFICE.

JOHN B. MERWIN, OF SPRINGFIELD, ILLINOIS.

MINE-CAR MOTOR.

No. 863,077. Specification of Letters Patent. Patented Aug. 13, 1907.

Application filed July 26, 1906. Serial No. 327,958.

To all whom it may concern:

Be it known that I, JOHN B. MERWIN, a citizen of the United States, residing at Springfield, in the county of Sangamon and State of Illinois, have invented a new and useful Mine-Car Motor, of which the following is such a full, clear, and exact description as will enable others skilled in the art to which it appertains to make and use my said invention.

My invention relates to motors adapted for underground haulage.

The purposes of my invention are to provide a main frame combining great strength, compactness and rigidity; to provide improved means for connecting the bed-plate of the engine with the main frame; to provide reversing mechanism of improved construction adapted to control forward and rearward movements of the motor; to provide means adapting one pair of the motor wheels to yield to conform to inequalities of the track on which the motor is running; to provide a compact arrangement of the engine, the fuel tank, the cooler, the exhaust muffler and accessories, suited to the restricted space within which the motor must be operated; to provide means for operating at one speed during the forward travel of the motor; to provide means connecting all of the supporting wheels of the motor so that all may serve as drivers; and to provide other details of construction.

With these ends in view my invention consists in the novel features of construction and combinations of parts shown in the annexed drawings to which reference is hereby made and hereinafter particularly described and finally recited in the claims.

Referring to the drawings in which similar reference letters designate like parts in the several views Figure 1 is a side elevation of the complete motor; Fig. 2. is a reduced top plan of the motor frame and clutches, the engine being removed; Fig. 3. is an enlarged vertical section on the line 3. 3. of Fig. 2. Fig. 4. is a reduced top plan of the motor; Fig. 5. is a vertical section on the line 5. 5. of Fig. 2. Figs. 6, 7, and 8 are side elevations of one set of the side members of the main frame. Fig. 9 is a partial vertical section on the line 9. 9. of Fig. 3. Fig. 10. is an enlarged perspective view of one of the bed-plate supports, detached; Fig. 11. is an enlarged horizontal axial section through the clutch mechanism; Fig. 12 is an enlarged isometric projection of one of the bumper plates; Fig. 13 is an enlarged partial vertical section through the frame and axle box on the line 13. 13. of Fig. 2, Fig. 14 is a partial vertical transverse section on the line 14. 14. of Fig. 4. and Fig. 15. is an enlarged detached isometric view of one of the annular clamps supporting the clutch-levers.

The side pieces of the main frame are composite structures consisting of a stringer A, an intermediate member A^1 and a truss member A^2, all of which are preferably of bar steel of suitable dimensions. The bars A^1 have bends a to accommodate the front axle boxes of the motor; and bends a^1 to accommodate the rear axle boxes and the bolster plates. The bars A^2 are bent as shown at a^2 and a^3 to form horizontal parts fitting on top of the bends a and a^1 respectively and to form feet a^4, brace-members a^5, and shoulders a^6, adapted to fit on top of the cross piece A^3.

At each end of the cross piece A^3 is a bolt a^7 which extends through the plates A, A^1, A^2 and A^3 and connects them firmly together. One edge of the cross piece A^3 rests squarely against the vertical members of the bars A^1, and its other edge rests against the shoulders a^6 of the bars A^2. Bolts a^8 pass through and connect the bars A, A^1 and the cross piece A^3. Bolts a^9 pass through the channel bar F and through the bars A^1 and A^2 at the central part of the bends a^1 and a^3 as clearly shown in Fig. 9. Bolts a^{10} (Figs. 2 and 13) pass through the front axle boxes G^1, the bars A^1 and the bars A^2, and connect the parts firmly together with the boxes lying in the bends a of the bars A^1 and the parts a^2 of the bars A^2 lying on top of the upwardly bent parts of the bars A^1.

Bumper plates B provided with bumpers b are secured on the main frame by bolts a^{12} passing through the plates B and the bars A^1 and A. A wood floor C is suitably secured on the main frame. Seat supports D extend transversely across the frame on top of the floor and have vertical members to which the seats D^1 are secured. Sand boxes E are secured on the seats D^1. Pipes e communicating with the sand boxes supply sand onto the rails in front of the front wheels of the motor. A channel bar F^1 lies under and is parallel to the bar F. Journal boxes G are fitted to the channel bar F^1 and are connected therewith by bolts g. The rear axle H turns in the boxes G, and the front axle H^1 turns in the boxes G^1.

Bent plates F^2 are secured to the channel bars F and F^1 respectively, by bolts f. A bolt F^3 extends through the bends of the plates F^2 and connects the plates so as to form a central hinge connection between the channeled bolster plates F and F^1.

The wheels H^3 are secured on the axles H and H^1 respectively. Connecting rods H^4 connect the wheels H^3 in pairs. Bars A^4 arched as shown at a^{14} (Fig. 10.) are provided with holes a^{16} and a^{17}. Bolts a^{15} (Fig. 2.) pass through the holes a^{17} and through corresponding holes in the bars A, A^1 and A^2 and connect the parts firmly together. The bed-plate bolts pass through the bed plate K and through the holes a^{16} and connect the bed-plate with the arched plates A^4. A channel bar A^5 is connected with the side bars A and A^1 by bolts a^{18}. A bar a^{19} occupies the channel of the bar A^5 and supports the front end of the bed plate as indicated by dotted lines in Fig. 5, the thickness of this bar is gaged to support the bed plate in a level position and in practice the front end of the bed plate may

be raised or lowered by making the bars a^{19} of suitable thickness and thereby avoiding needless labor in fitting and leveling the bed-plate on the frame.

A cog wheel K^1 turns on a stud k on the bed plate K. A shaft K^2 extends transversely through the bed plate and turns in suitable bearing k^1 on the bed plate. A cog wheel K^3 is secured on the shaft K^2; the engine frame K^4 is mounted on the bed plate K; the crank shaft K^5 turns in suitable bearings on the frame K^4. Fly wheels K^6 and a cog wheel K^7 are secured on the crank shaft K^5. The cog wheel K^7 meshes with and drives the cog wheel K^3. A sprocket wheel K^8 is secured on the shaft K^2 and a similar sprocket wheel K^9 is secured on the hub of the wheel K^1. Circular plates M having elongated screw-threaded hubs m are secured on the front axles H^1.

Clamping rings M^1 are internally screw-threaded and fit on the screw-threaded hubs m. The rings M^1 have members m^1 slightly separated from each other as shown in Fig. 15. Bolts m^2 extending through the members m^1 are provided with nuts which may be turned to draw together the members m^1 and cause the ring M^1 to bind tightly on the screw-threaded part m of the plate M. Levers M^2 turn on bolts m^4 extending through the lugs m^3 on the ring M^1. Disks M^3 having integral annular flanges m^5 are fitted to slide on the square parts m^{12} of the hubs m. Sprocket wheels M^4 are fitted to turn on the enlarged cylindrical parts m^{13} of the hubs m. Disks M^{10} preferably of raw hide or undurated fiber are fitted to slide on square parts m^{12} of the hubs m, between the disks M^3 and the sprocket wheels M^4. A circular block M^5 having chamfered ends m^6 and a circumferential channel m^7 is slidable on the axle H^1. A lever M^6 (Fig. 2) is fulcrumed on a stationary block m^8 suitably secured on the bed plate K. A ring m^9 fits around the block M^5 and is provided with rollers m^{10} fitting loosely in the channel m^7. By moving the free end of the lever M^6 to the right or the left the block M^5 may be slid to the right or the left on the axle H^1.

In Fig. 11 of the drawings the right hand clutch member M^3 is shown as engaged with the right hand sprocket wheel M^4 and the left hand clutch member M^3 is shown as disengaged from the wheel M^4.

When the parts occupy the position shown in the right hand part of Fig. 11, the disk M^{10} presses against the sprocket wheel M^4; and holds it against the plate M so that under normal conditions it cannot turn between the plate and the disk, but under abnormal strain will turn between the plate and the disk to prevent breakage of the parts.

In order that the disk may exert the required pressure, and also to provide for the wear of the parts the ring M^1 may be moved toward or away from the disk F^5 by turning the ring on the screw threaded part m to the right to move the ring toward the disk and turning it to the left to move the ring away from the disk. When the ring has been set in position to produce the desired pressure against the disk it will be secured by turning the nuts on the bolts m^2 to draw together the parts m^1 and thereby clamp the ring M^1 firmly on the hub m so that the ring cannot turn.

The parts being in the position shown in the right hand part of Fig. 11, if the free end of the lever M^6 be moved to the left it will cause the block M^5 to slide to the left and be withdrawn from between the right hand levers M^2 thereby releasing the right hand levers and removing the pressure from the disk M^3 and the pressure on the disk being removed the right hand wheel M^4 will be free to turn between the plate M and the disk M^{10}; and if the block M^5 be moved still further to the left the chamfered end m^6 of the block acting on the tapering parts m^{11} of the left hand levers M^2 will raise them and cause the levers to act against the disk M^3 so as to firmly clamp the left-hand wheel M^4 between the plate M and the disk M^{10}. A sprocket chain M^8 connects the right hand wheel M^4 with the sprocket wheel K^9 and the sprocket chain M^9 connects the left hand wheel M^4 with the sprocket wheel K^8. When the block M^5 is midway between the right hand and left hand pairs of levers M^2, both of the wheels M^4 will turn freely on the hub m.

The engine may be of any suitable construction and need not be particularly described. The fuel tank N is suitably supported on the engine frame; the water tank O is supported on the angle bar F and is held by brackets O^1 suitably secured on the bed-plate K. The exhaust pipe P suitably connected with the engine cylinder discharges into the tank O.

When the engine is running and the motor is at rest the block M^5 will occupy a central position between the pairs of levers M^2. If it be desired to move the motor forward as indicated by the arrow X Fig. 1. the free end of the lever M^6 will be moved to the right to bring into action the right hand clutch member M^3 and; if it be desired to move the motor rearward the lever will be moved to the left to bring the left hand clutch member M^3 into action. When the right hand clutch member M^3 is in action it will cause the disk M^{10} to clamp the wheel M^4 so that the chain M^8 operating on the wheel will turn the axle H^1 thereby turning the front wheels H^3, and the connecting rods H^4 driven by the front wheels will cause simultaneous turning of the rear wheels, to propel the motor forward. When the left hand clutch member is in action it will clamp the left hand wheel M^4 so that the chain M^9 will operate the wheel to turn the axle and cause the turning of the wheels H^3 to propel the motor rearward.

From the foregoing it will be seen that forward and rearward movement of the motor or stopping of the motor will be accomplished by moving the lever M^6 to the right or the left or by leaving it in the central position shown in Fig. 2.

In this machine the mechanism is constructed and arranged to occupy the least possible space vertically and at the same time to have the great strength and rigidity sufficient to withstand the hard usage to which machines of this class are subjected.

The exhaust muffler P being connected to discharge into the water tank O reduces to the minimum the contamination of the air of the mine.

Having fully described my invention what I claim as new and desire to secure by Letters Patent is;

1. A composite side-member for motor frames comprising a stringer; an intermediate bar having a bent part to accommodate axle-boxes and a bent part to accommodate axle boxes and bolster plates; a truss-bar formed to fit on the bent parts respectively of the intermediate bar and having integral brace members; and means for securing together the stringer, the intermediate bar and the truss bar.

2. In a motor-frame, composite side-members each comprising a stringer, an intermediate bar having a bend adapted to accommodate axle boxes and a bend adapted to accommodate axle boxes and bolster plates, a truss bar having a shoulder and brace-members and also having bends fitting on the bends of the intermediate bar; in combination with a cross piece connecting the side members of the frame and fitting against the shoulders of the truss members and against the vertical members of the bends of the intermediate bars which accommodate the bolster plates and axle boxes and means for securing said cross piece on said side-members.

3. A motor frame comprising side members having an opening adapted to accommodate axle boxes, an opening adapted to accommodate axle boxes and a bolster, and braces contiguous to said openings respectively, and transverse members connecting said side members.

4. A motor structure comprising side pieces, cross pieces connecting said side pieces, transverse arched plates and a transverse channel-bar secured on said side pieces and adapted to support a bed plate, a bed plate connected with the transverse arched plates, and a bar under the bed plate and fitting in the channel of the transverse channel-bar to level the bed plate.

5. The combination of frame-members having bends adapted to accommodate axle boxes, axle boxes fitting in the bends of said frame-members, axles turning in said axle boxes, car-wheels secured on said axles, a slidable block on one of said axles, a lever connected to slide said block, plates secured on one of said axles and having elongated hubs, sprocket wheels turnable on the hubs of said plates, disks slidable on the hubs of said plates, rings adjustable on the hubs of said plates and levers mounted on said rings and operative by the slidable blocks.

6. The combination of a main structure having bends adapted to accommodate axle-boxes, axle boxes fitting in the bends of the main-structure, axles turning in said axle boxes, car wheels secured on said axles, a slidable block on the main-drive axle, a lever connected to slide said block, right hand and left hand plates secured on the main-drive axle and having elongated hubs, sprocket wheels turnable on the hubs of said plates, clutch-members slidable on the hubs of said plates, rings adjustable on the hubs of said plates, levers mounted on said rings and operative by the slidable block, a revoluble engine shaft, fly wheels on the engine shaft, a cog wheel on the engine shaft, a revoluble secondary shaft, a cog wheel on the secondary shaft and meshing with the cog wheel on the engine shaft, a cog-wheel meshing with the cog-wheel on the secondary shaft, a sprocket wheel connected with said secondary cog-wheel, a sprocket chain connecting said sprocket wheel with the sprocket wheel on the hub of the right hand plate on the main-drive axle, a sprocket wheel secured on the secondary shaft, and a sprocket chain connecting said last named sprocket wheel with the sprocket wheel on the hub of the left-hand plate on the main-drive axle.

7. The combination of parallel bolster-plates, a hinge connection between said bolster-plates, axle boxes connected with one of said bolster plates, an axle turning in said axle boxes, wheels secured on said axle, a main frame having side members formed to permit vertical movement of the axle boxes, and means for securing one of said bolster-plates to the side pieces of the main frame.

8. The combination of stringers, intermediate bars having bent parts adapted to accommodate axle-boxes and the ends of bolster plates, truss bars formed to fit on the bent part of the intermediate bars, bolster plates fitting in the bent parts of the intermediate bars, axle-boxes fitting in the bent parts of said intermediate bars, means for connecting one of the bolster plates with the intermediate bar and the truss bar, a hinge connecting the bolster plates, means for connecting the axle-boxes with one of the bolster plates and means for connecting together the stringers, the intermediate bars and the truss bars.

9. A motor frame comprising side members having an opening adapted to accommodate axle boxes, an opening adapted to accommodate axle boxes and a bolster, braces contiguous to said openings, means connecting said side members, and fixed bumpers adjacent to the ends of the side members.

In witness whereof I have hereunto subscribed my name at Springfield, Illinois this 24th day of July 1906.

JOHN B. MERWIN.

Witnesses:
O. A. MERKEL,
E. H. LICHTENBERG.