(No Model.) 5 Sheets—Sheet 1.

C. F. GODDARD.

THRASHING MACHINE.

No. 542,519. Patented July 9, 1895.

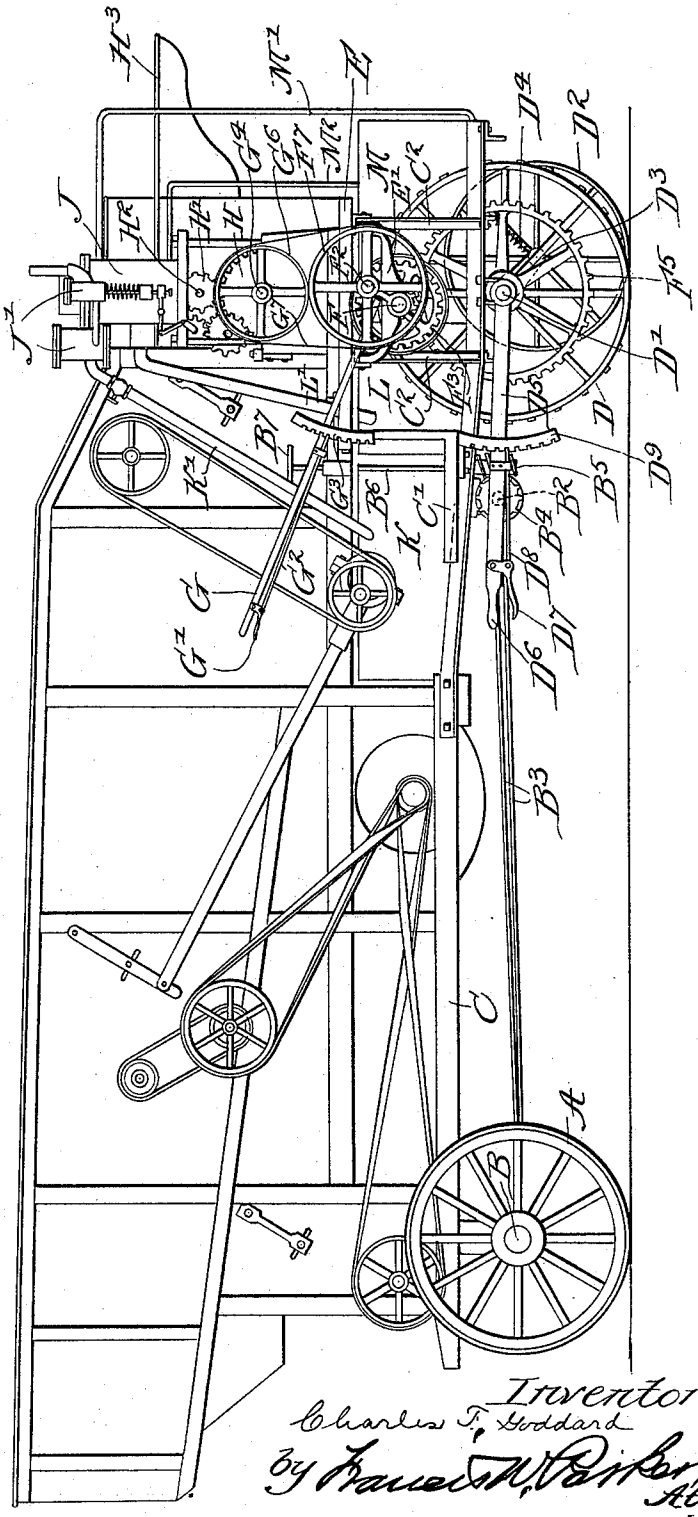

Fig. 1.

Witnesses
Wm. L. Fleming
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THRASHING MACHINE.

No. 542,519. Patented July 9, 1895.

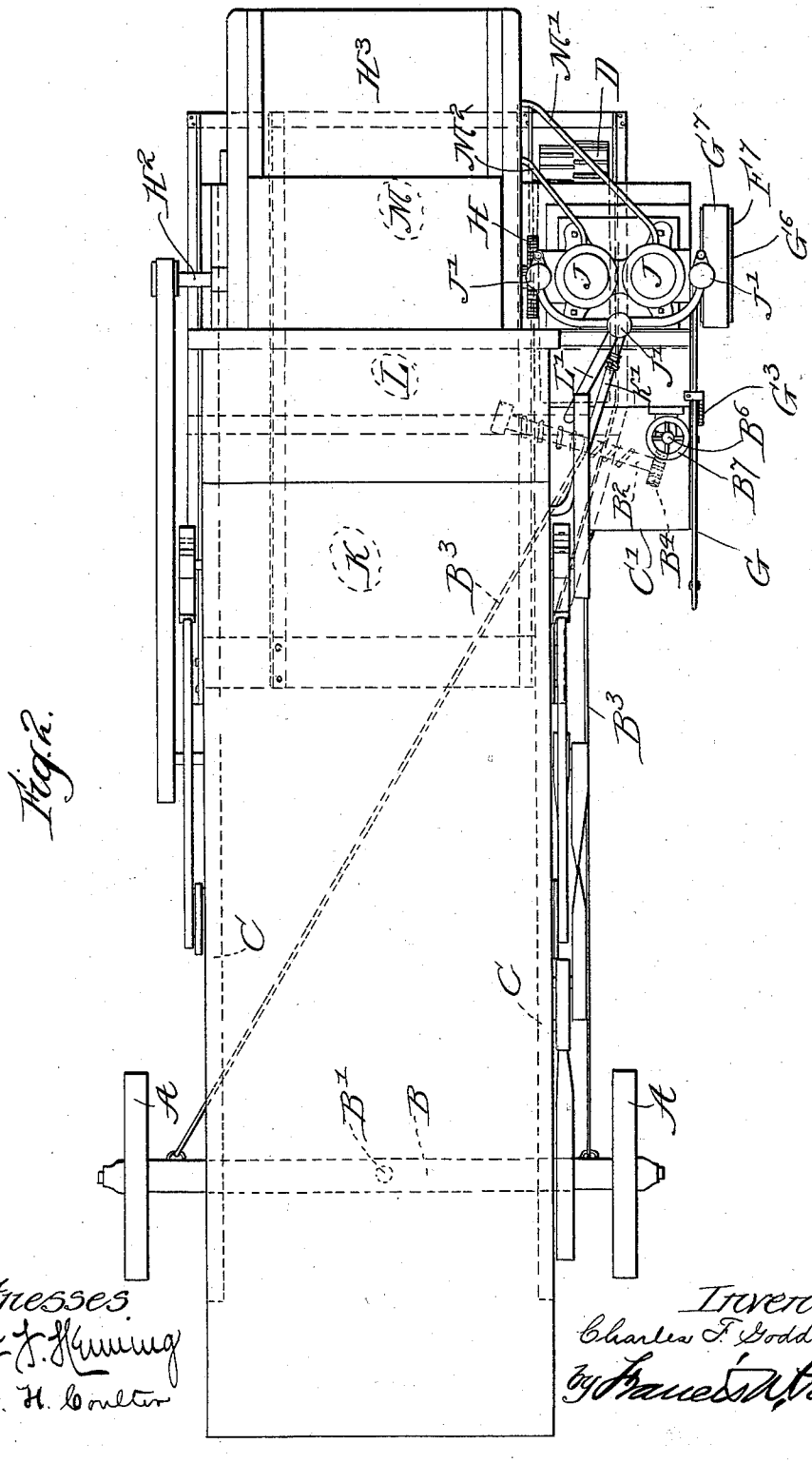

Fig. 2.

Witnesses
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(No Model.) 5 Sheets—Sheet 3.

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THRASHING MACHINE.

No. 542,519. Patented July 9, 1895.

Fig. 4.

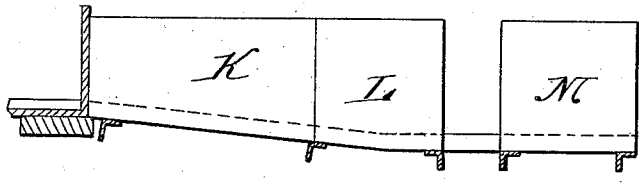


Fig. 3.

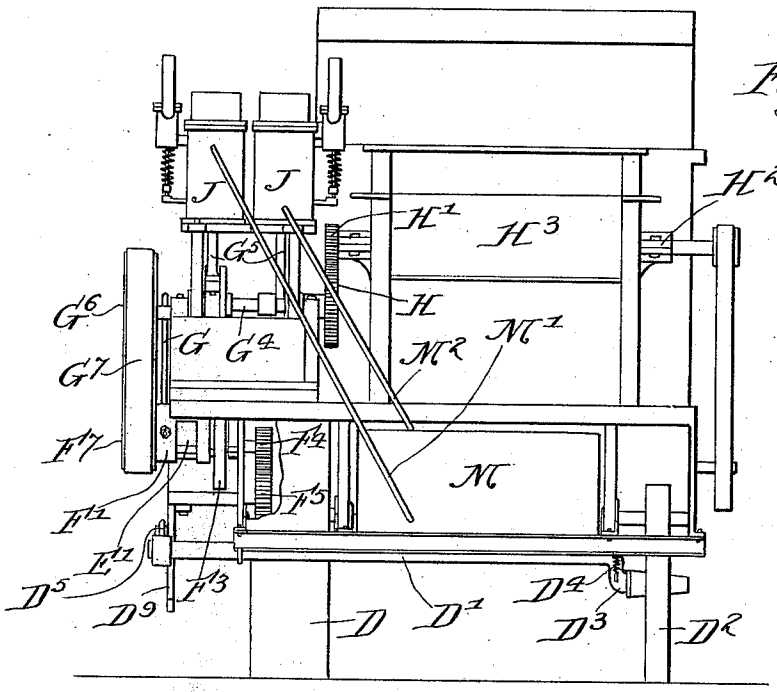
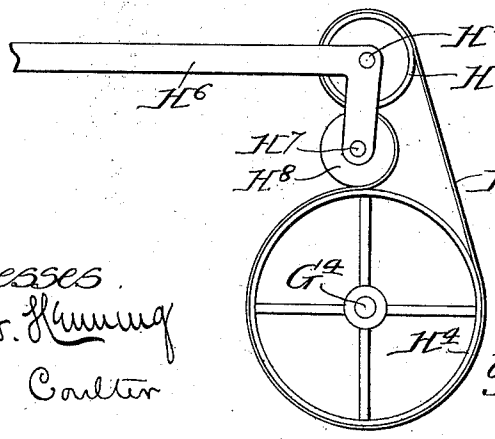


Fig. 5.



Witnesses.
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(No Model.) 5 Sheets—Sheet 4.

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THRASHING MACHINE.

No. 542,519. Patented July 9, 1895.

Fig. 8.

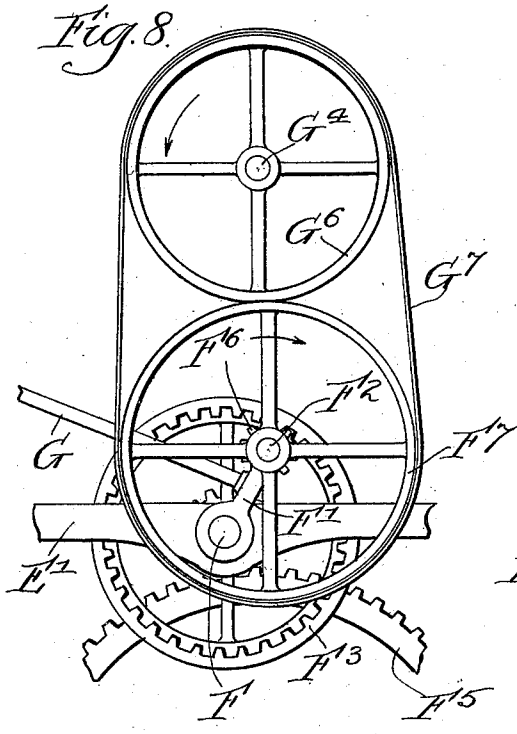


Fig. 9

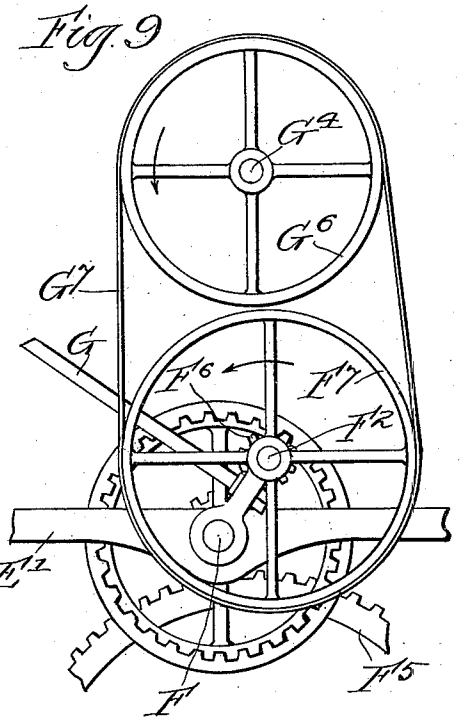


Fig. 6.

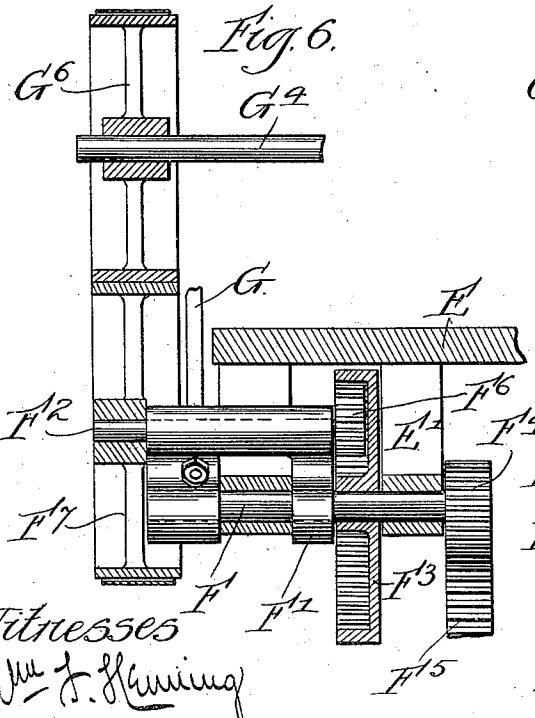
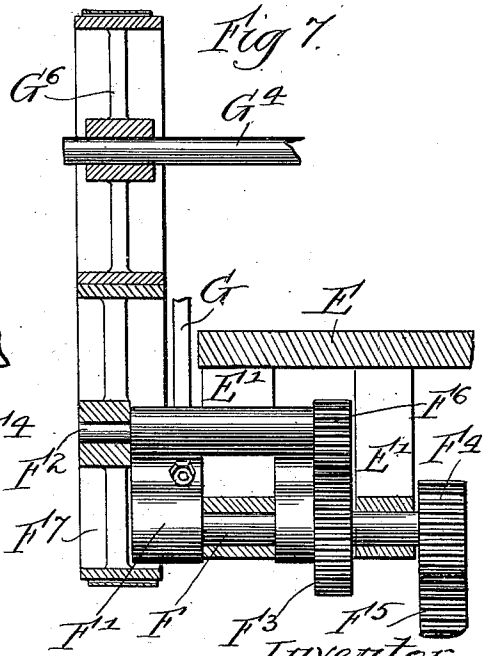


Fig 7.



Witnesses
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(No Model.) 5 Sheets—Sheet 5.

C. F. GODDARD.

THRASHING MACHINE.

No. 542,519. Patented July 9, 1895.

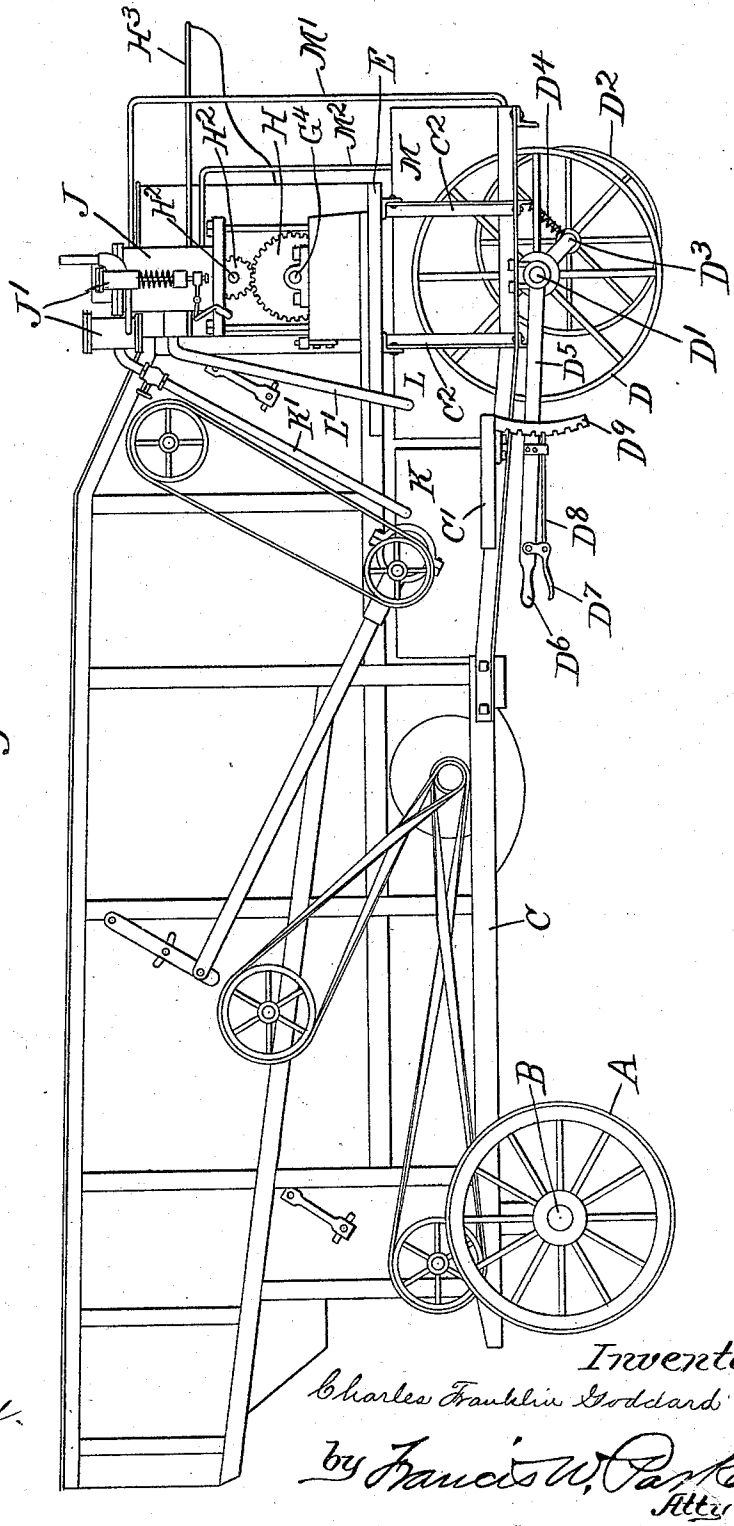

Fig. 10.

Witnesses.
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by Francis W. Parker,
Attr.

UNITED STATES PATENT OFFICE.

CHARLES F. GODDARD, OF CHICAGO, ILLINOIS, ASSIGNOR TO RICHARD LOVE DUVALL, OF SAME PLACE.

THRASHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 542,519, dated July 9, 1895.

Application filed November 7, 1894. Serial No. 528,171. (No model.)

To all whom it may concern:

Be it known that I, CHARLES F. GODDARD, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Thrashing-Machines, of which the following is a specification.

My invention relates to thrashing-machines and engines therefor or combined thrashing machines and engines, and has particular reference to improvements in such devices whereby a light and portable engine may be combined with a thrashing-machine, and also the motor or power supplying devices for the engine, the whole being supported on one and the same truck or carriage containing, if desired, a traction wheel and gear, so that there may be self-contained in the entire device means, if desired, for hauling or moving the entire device from place to place and also for actuating the operating mechanism of the thrasher.

My invention further consists in certain new and useful improvements whereby the power-transmission, the reversing, stopping and starting and setting, leveling, or adjusting of the machine may be readily accomplished.

The invention is illustrated in the accompanying drawings, wherein—

Figure 1 is a side view of the device. Fig. 2 is a plan view. Fig. 3 is a front view. Fig. 4 is a detailed view of the fluid-supplying devices for the gas-engine. Fig. 5 is a detailed view of a modification in the power-transmitting device. Figs. 6 and 7 are cross-sections of two varieties of the traction power-transmitting devices. Figs. 8 and 9 are side views of the traction power-transmitting device in two positions. Fig. 10 is a side view of the machine without traction-wheel and gear.

It will, of course, be understood that some of the parts are omitted where not necessary to illustrate the operation of the remainder, and certain minor parts are omitted when they obstruct the view. It has not seemed necessary to illustrate all of the details of the thrashing-machine proper, since such details greatly vary, and my invention is applicable practically to all kinds of such thrashers.

Like parts are indicated by the same letters in all the figures.

A A are the rear supporting-wheels on the axle B, which is pivotally connected at B′ with the frame of the thrasher in any desired manner. B^2 is a short shaft at the forward end of the machine normally at right angles to a line from the middle of such shaft to the middle of the axle B. B^3 B^3 are chains or wire rope or the like leading from the opposite ends of the axle B to the short shaft B^2, about which they are oppositely wound and to which their ends are secured. On the outer end of the shaft B^2 is the bevel-gear B^4 engaging the worm B^5 on the vertical rod B^6, which is controlled by the hand-wheel B^7. The particular method of connecting these several parts is not material, except that it should be such that by turning the hand-wheel B^7 in either direction the axle B may be turned in the corresponding direction on its pivot B′, so as to vary the direction of the motion of the thrasher. Moreover, by changing the position of the axle B when the machine is at rest a certain amount of protection is secured against the tendency of the machine to rock longitudinally.

C indicates the lower supporting-frame of the thrasher proper, and may be constructed in any desired manner. Laterally projecting from one side of the forward end thereof is the frame C′, consisting of suitable angle-bars, for example, and carrying the standards C^2 C^2, the whole together constituting a laterally-projecting frame within which the traction wheel D is journaled on the end of the axle D′, on the opposite end of which is journaled the forward supporting-wheel D^3 on the short crank D^3 on such end of the axle. This axle is journaled so as to rotate on the frame of the machine, and the small supporting-wheel D^2 is journaled on the axle. Toward the outer end of the crank is secured one end of the expansion-spring D^4, the other end being fastened to the frame, whereby the spring tends to force the crank downwardly and press the wheel D^2 toward the ground. D^5 is a hand-lever secured to such axle, preferably on the side, near the traction-wheel, and it is provided with a handle D^6 and thumb-lever D^7 and lock-rod D^8 and a rack-arc D^9, to which

such lock-bar is opposed, so that the lever may be moved to turn the axle or may be locked in any desired position.

Supported upon the standard C^2 and projecting from the side of the thrasher is the bed plate or frame E, upon which the driving portions of the engine are located. Journaled in the hangers E′ E′ depending from this bed-plate is the short shaft F, upon which is journaled one end of the pivot-block F′, the other end of which carries the short shaft F^2. On the shaft F is secured the gear F^3, which may be either an internal gear, as shown in Fig. 6, or an external gear, as shown in Fig. 7. This shaft also carries the pinion F^4, which is adapted to engage the gear F^5 on the traction-wheel. The short shaft F^2 carries at one end the pinion F^6, adapted to engage the gear F^3, and at the other the friction wheel or pulley F^7. Rigidly secured to the pivot-block, preferably as indicated between the shafts F and F^2, is the arm G, which carries the thumb-lever G′, associated with the locking-bar G^2, which is adapted to be received into the teeth on the arc-shaped rack G^3, whereby the arm, and therefore the pivot-block, may be locked in any desired position.

G^4 is the engine-shaft, which is suitably journaled and driven in the usual manner from the piston-rods G^5 G^5 of the engine. This shaft at one end carries the friction-wheel or pulley G^6.

G^7 is a belt which surrounds the pulleys or friction-wheels G^6 and F^7, and when stretched by their separation transmits power from one to the other.

On the opposite end of the shaft G^4 is the gear-wheel H, meshing with the pinion H′ on the end of the thrashing-machine cylinder-shaft H^2. The thrashing-cylinder is included within the casing H^3 in the forward part of the thrashing-machine proper in the usual manner. In Fig. 5 I have shown a modification of these parts, which I will now describe.

H^4 is a friction wheel or pulley on the engine-shaft G^4, and which is substituted for the gear-wheel H. In like manner the friction wheel or pulley H^5 is substituted on the cylinder-shaft H^2 for the pinion H′.

H^6 is an elbow-crank lever pivoted on the shaft H^2 and carrying at the extremity of its short end the short shaft H^7, upon which is the friction or pulley wheel H^8.

H^9 is a belt, which travels in the manner indicated about the three friction wheels or pulleys. The diameter and relation of the three wheels are such that when the friction wheel or pulley H^8 is forced in between the other two, it tends to cramp or grip the belt against the two wheels, also to tighten the belt about them, also to support them on their journals against the action of the tightened belt. The long end of the lever H^6 would be developed into a handle and provided with the usual locking device, for example, such as is associated with the handles G and D^6.

J J are the engine-cylinders having the valve boxes and pipes J′ J′.

K is the tank or carburetor containing the gasoline. L is the muffler; M, the water-tank. These three tanks are secured to the frame of the thrasher and over the axle toward the forward end of the machine, as indicated. The water-tank is connected by the pipes M′ M^2 with the cylinders of the gas-engine in the proper and usual manner. The carburetor is connected with the valve-cases by means of the pipe K′, and the muffler is connected with the exhaust by means of the pipe L′.

D^{20} is a broad heavy supporting-wheel used in lieu of traction-wheel when traction-wheel and gear are dispensed with.

A large number of the parts illustrated I have not lettered or specifically described, because they have to do with the operation of the thrasher or separator or engine proper. My invention, however, relates more particularly to the other parts, such as I have fully described. It is, of course, understood that there may be great variation in the construction of these several features which I have illustrated and described, and some of them may be omitted with or without substitution of other parts, without perhaps materially affecting the operation of the remaining features. Moreover, in actual experience it will be necessary to vary considerably all the general relations and proportions of the several parts to adapt my improvements to the various kinds of separators. I do not, therefore, wish to be limited to the precise form of construction shown, nor to the use of all of the elements together.

The use and operation of my invention are as follows: I will first have reference to the means for guiding and leveling or setting the device. It will be observed that I have provided a rear pivoted axle with a forward controlling mechanism including a hand-wheel, and by the operation of that hand-wheel the device may be guided or directed in its progress. With separators generally, and particularly with separators of this class, and when my improvements are applied to them, it is important that there should be means for bringing the forward end of the machine to a level, and this I have accomplished by means of the crank-axle and controlling devices. The axle is normally in such position that the supporting-wheel, which is smaller in diameter than the traction-wheel, is on a level with the traction-wheel, so that the machine at its forward end would rest level if the two wheels were upon a level surface. In this condition the machine is ready for transportation. The irregularities in the road are taken up more or less by the action of the spring associated with the crank on the end of the axle. If, now, the machine is brought to rest in a position for use and it is found that the front end of the machine is not level, instead of resorting to the old expedient of digging

away from under one wheel and blocking up the other, I may simply by operating the handle D^5 D^6 turn the axle so as to raise or lower the smaller wheel thereof. Thus the forward end of the machine may be made to accommodate itself to irregularities of surface, and the difficulties in setting the machine heretofore encountered are largely avoided.

When my improvements are combined with traction-gear, it is desirable in machines of this character to have means whereby the power from the engine may be readily transmitted to the traction-wheel to propel the thrasher, or may be taken from the traction-wheel to bring the thrasher to rest. It is also evident that it would be necessary to provide means whereby this power may be applied to rotate the traction-wheel in either direction. Now these results I have accomplished by means of the mechanism illustrated in Figs. 6, 7, 8, and 9. The controlling-arm G, when moved in one or the other direction, will evidently move the shaft F^2 in an arc about the shaft F, and thus vary the distance between the shafts G^4 and F^2, or, in other words, vary the distance between the centers of the friction wheels or pulleys G^6 F^7. This is illustrated in Figs. 8 and 9, the wheels being shown in contact in Fig. 8 and separated in Fig. 9. When the wheels are brought together, as indicated in Fig. 8, the belt G^7 will plainly be slackened, so as not to serve as a power-transmitting device; but the two friction-wheels will be brought together, so that from the wheel G^6, which is driven from the engine-shaft, motion will be communicated to the wheel F^7, as indicated by the arrow. When the two wheels are separated, as indicated in Fig. 9, far enough to tighten the belt, the power will be communicated from the pulley G^6 to the pulley F^7, and thus the latter will be driven in the direction of the arrow and in a direction opposite to that produced when the device is used as illustrated in Fig. 8. Moreover, there is an intermediate position in which the two wheels operate neither as pulleys nor friction-wheels, and in this position no power is transmitted. Assuming now that, as indicated, motion can be imparted in either direction to the wheel F^7, or that it can be brought to rest, by reference to Figs. 6 and 7, we will see how the traction-wheel is controlled. The rotation of the wheel F^7 rotates the axle F^2 and with it the gear F^6. This gear or pinion engages the gear F^3 and thus drives the shaft F; but this shaft has in its inner end the pinion F^4, which engages the gear F^5 on the traction-wheel and thus puts the latter in motion. Plainly, therefore, by operating the handle G the traction-wheel may be disconnected from the engine-shaft or may be driven therefrom in either direction. Moreover, the transmission takes place by frictional contact rather than by gears. This frictional contact method of transmission is highly important in many devices such as I have here suggested, and largely because of the high rate of speed at which the engine commonly runs. This is particularly important with gas-engines and the like, where there is no means for reversing the engine running continually in the same direction.

I have indicated in Fig. 1 and elsewhere the carburetor, muffler, and water-tank of an ordinary gas-engine outfit, and they are properly connected with the engine—as, for example, in this case the water-tank—by means of two pipes, the carburetor by means of one pipe with the valves of the engine, and the muffler by means of one pipe with the exhaust of the engine. By this means the device is purely and entirely self-contained.

I have combined and mounted upon a single carriage truck or frame the separator of any desired character, an engine of any such character as may be practicable, the power-supplying devices or means for said engine, and operating connections from the engine to the mechanism of the thrasher, and also, if desired, from the engine to the traction or driving mechanism of the entire device. By this means no tender or associated device is required. The device is self-contained, requires but a single operator to move it from place to place or to operate it, and obviates the necessity of transporting fuel, water, and the like in any considerable quantities—such, for example, as would be necessary in the case of an attempt to use a steam-engine.

It will also be observed that the engine and power-supplying devices which I employ are of such nature that they may be associated together in close proximity to the thrasher and grain to be worked upon. This would not be the case with engines operated from steam-boilers and the like.

I find that with engines operating at a high rate of speed, as, for example, the gas-engine which I have suggested here as one form of engine to be used, it is desirable frequently to have a frictional connection with the cylinder, and hence the mechanism of Fig. 5. By this mechanism the power is transmitted from the engine-shaft to the cylinder-shaft by means of a belt, and since this belt must be short and tight and since there would be a great tendency to bend or throw the parts out of position as a result of such tight belt, I have devised this improvement, wherein I employ the intermediate friction wheel or pulley, so situated and of such size that when forced between the other two it tightens the belt about them, cramps the belt upon their surfaces so as to prevent slipping, and at the same time furnishes a support for their peripheries and between them, so as to prevent the bending or displacement of the shafts incident ordinarily to tight belts. This also obviates the dangers of excessive friction in the shafts and bearings which might result from a tight belt as ordinarily used. With a frictional contact, preferably substantially such as I have described, it is evident that in the event of the cylinder being choked the belts or frictional

engaging parts might slip sufficient to avoid the injury which otherwise might result to the operating parts of the machine.

The power-transmitting device illustrated in Fig. 5 and the mechanism illustrated in Figs. 6, 7, 8, and 9 it is obvious are capable of use in devices of this general character, where the other devices which go to make up the complete construction, or some of them, are omitted and many of them greatly changed. Indeed, either of these devices would be capable without material modification of use in any mechanism where the transmission of power in this general manner is desired and where in the application of power from one mechanism to another it is important to control the application so as to reverse or stop the driven part, and also where it is desirable to gradually vary the amount of the power transmitted.

Where the circumstances under which the machine is to be employed are such as to make the use of traction-gear unnecessary or undesirable, I prefer to substitute for such gear and wheel a plain supporting-wheel, of such size and shape as to serve properly to sustain the parts of the machine. Indeed, by the term "traction-wheel" I mean not only a traction-wheel proper associated with a traction-gear, but a wheel of wide tread or the like, so as to serve as such supporting-wheel.

My engine is preferably connected directly and non-elastically to the cylinder of the separator—that is, by means other than a belt or the like.

In a device of the general character here illustrated for many purposes it is desirable to have the whole apparatus supported upon a single common frame as distinguished from a frame consisting of sections hinged together or a frame consisting of sections which are coupled together endwise. Therefore I have limited certain claims to this peculiarity of construction, as it will be found that such construction leads to variations in the relations and connections of the parts. On the other hand, there are features of my invention which are not necessarily incorporated in a device where all the parts are supported upon one and the same common frame. Therefore certain of my claims are not so limited.

I do not wish to be understood as considering my invention to consist in the precise device here shown, or in the complete self-contained thrashing-machine here illustrated, as it will be perfectly plain that certain features which I have here illustrated and sought to claim might be incorporated in a complete thrashing-machine, where the other features or elements greatly differ from those which I have exhibited.

As I prefer to construct my device and as I have therefore in some of the claims indicated, the cylinder of the separator preferably runs all the time, being so connected with the engine or engine-shaft as that it serves as a fly-wheel, and also so connected as that it runs all the time the engine is running.

The cylinder of a thrashing-machine, as they are commonly made, is not so heavy as the fly-wheel which would commonly be used with a gas-engine adapted to drive such cylinder, but the cylinder is commonly driven with a much higher rate of speed than would be necessary with a balance or fly wheel. Hence, as I have found by practical experience, the cylinder can be made to serve as a balance or fly wheel.

Of course, as above suggested, some of the features of my invention could be utilized and incorporated in a machine in which the engine was provided with an additional or separate fly-wheel or balance-wheel, should the latter be found necessary; and I do not wish to be limited in all my claims to a construction in which there is no balance or fly wheel except the cylinder.

I claim—

1. In a self-contained thrashing machine the combination upon a single common frame of the separator with a traction wheel, an engine, a power supplying source for such engine, connections from the engine to the traction wheel, and connections from the engine to the separator mechanism so constructed as that the cylinder of the separator serves as the fly wheel for the engine.

2. In a thrashing machine the combination of the separator with a forward axle having a crank at one end, a traction wheel at the other end, a smaller wheel on the crank, and a handle for turning the axle so as to vary the relative positions of the two wheels.

3. In a thrashing machine the combination of the separator with a forward axle having a crank at one end, a traction wheel at the other end, a smaller wheel on the crank, and a handle for turning the axle so as to vary the relative positions of the two wheels, and a spring between the crank and the frame tending to force the crank downwardly, and thus to force the smaller wheel toward the ground.

4. In a self contained thrashing machine the combination upon a single common frame of the separator, an engine, a power supplying source for such engine, and connections from the engine to the separator mechanism so constructed as that the cylinder of the separator serves as the fly wheel for the engine.

5. In a self contained thrashing machine the combination upon a common frame of a separator with a gas engine, a carburetor and water tank, and connections from the carburetor and water tank to the engine, and driving connections from the engine to the separator mechanism, said driving connections being so constructed that the cylinder of the separator serves as the fly wheel of the engine.

6. In a thrashing machine the combination of a separator with a forward axle having a crank at one end, a broad tread supporting

wheel at one end, a smaller wheel on the crank, and a handle for turning the axle so as to vary the relative positions of the two wheels.

7. In a thrashing machine the combination of a separator with a forward axle having a crank at one end, a broad tread supporting wheel at one end, a smaller wheel on the crank, and a handle for turning the axle so as to vary the relative positions of the two wheels, and a spring between the crank and the frame tending to force the crank downwardly and thus to force the smaller wheel toward the ground.

8. The combination of a thrashing machine proper with a broad tread supporting wheel on one axle and a driving engine placed substantially over such supporting wheel, and a power supply or source of energy located on the common supporting frame and connected with the engine.

9. The combination of a thrashing machine proper with a forward axle having the usual supporting wheel at one end and a broad-tread supporting wheel at the other, and an engine and cylinder at the forward end and over the forward supporting wheels, the size, weight and arrangement of engine and cylinder being such that the forward supporting wheel sustains an amount of such total weight equal to the normal burden of such supporting wheel, the center of gravity of the remaining portion of such total weight being substantially over the broad tread supporting wheel, and a power supply or source of energy located on the common supporting frame and connected with the engine.

10. The combination of a thrashing machine proper with an engine mounted on the frame thereof and adapted to drive the operating mechanism of the thrasher, in combination with a broad tread supporting wheel, the line of motion of such engine being substantially vertical through the axis of such broad tread wheel, and a power supply or source of energy located on the common supporting frame and connected with the engine.

11. The combination of a thrashing machine proper having a cylinder with a supporting frame and a broad tread supporting wheel and an engine supported on said supporting frame connected with the cylinder so that the latter acts as a fly wheel, and a power supply or source of energy on the frame and operatively connected with the engine.

12. The combination of a thrashing machine proper with an engine, a broad tread supporting wheel at one end thereof, the engine operating so that its thrust is substantially in a vertical line through the axis of such supporting wheel, and an axle with supporting wheels pivoted at the other end so that one axle being placed at an angle to the other and the thrust of the engine being in a vertical direction the necessity of anchoring the machine is largely obviated, and a power supply or source of energy mounted on the frame and connected with the engine.

13. In a power-transmitting device, the combination of a driving wheel, a driven wheel, a belt connecting the said wheels, a shaft on which the driven wheel is mounted, a movable support for the said shaft, whereby the driving and driven wheels may be thrown into and out of contact with each other, a pinion on the shaft of the driven wheel, a gear wheel engaged by the said pinion and so arranged with relation thereto that they remain in gear whatever be the positions to which the driven wheel and the shaft may be adjusted, a shaft for the gear wheel, and connections from such latter shaft to the part ultimately to be driven.

14. In a thrashing machine the combination of the separator with a supporting traction wheel, a driving engine, and a power transmitting device from the engine to the traction wheel embracing two friction wheels or pulleys, to one of which the power is transmitted from the other either by frictional contact of the two wheels or by a belt about the two wheels.

15. In a power transmitting device the combination of two friction wheels or pulleys mounted one on the driving shaft, the other on the driven shaft, and surrounded by a belt, one of said friction wheels or pulleys movable with reference to the other so as to tighten the belt and disengage the wheels, or loosen the belt and bring the wheels operatively together.

16. In a self contained thrashing machine the combination on a common frame of a separator, with an engine, a power supply source for said engine, and a permanent driving connection from the engine shaft to the shaft of the cylinder of the separator so that both always revolve together.

17. In a self-contained thrashing machine the combination of the separator, with a traction wheel, an engine, a power supplying source for such engine, and connections from the engine to the traction wheel and connections from the engine to the separator mechanism so constructed that the cylinder of the separator serves as a fly wheel for the engine.

18. In a self contained thrashing machine the combination of the separator, with an engine, a power supplying source for such engine, and connections from the engine to the separator mechanism so constructed that the cylinder of the separator serves as a fly wheel for the engine.

19. In a self-contained thrashing machine the combination of a separator, with an engine, a power supply source for said engine, and a permanent driving connection from the engine shaft to the shaft of the cylinder of the separator so that both always revolve together.

20. In a self-contained thrashing machine, the combination upon a common frame of a separator with an engine in the nature of a gas engine but without a balance-wheel, a traction wheel, a carburetor and water tank, and connections from the carburetor and water tank to the engine, and driving connections from the engine to the separator cylin-

der and to the traction wheel mechanism, the connections from the engine to the separator cylinder being such that the latter acts as a balance or fly wheel.

21. In a self-contained thrashing machine, the combination of a separator with an engine in the nature of a gas engine but without a balance wheel, the two located on one and the same common frame, the power-supply source for the engine on the same frame, and connections from the power-supply source, to such engine, and power connections from the engine to the cylinder of the separator, so that the cylinder acts as a balance wheel.

22. In a self-contained thrashing machine, the combination of a separator with the cylinder of a gas engine, located on the separator frame and in close proximity to the cylinder, a power-supply source for the engine on the same frame, connections from the power supply source to the engine and power connections from the engine to the cylinder of the separator so that the cylinder acts as a balance wheel whereby a light and compact self-contained thrasher is produced, substantially as shown and described.

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Witnesses:
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