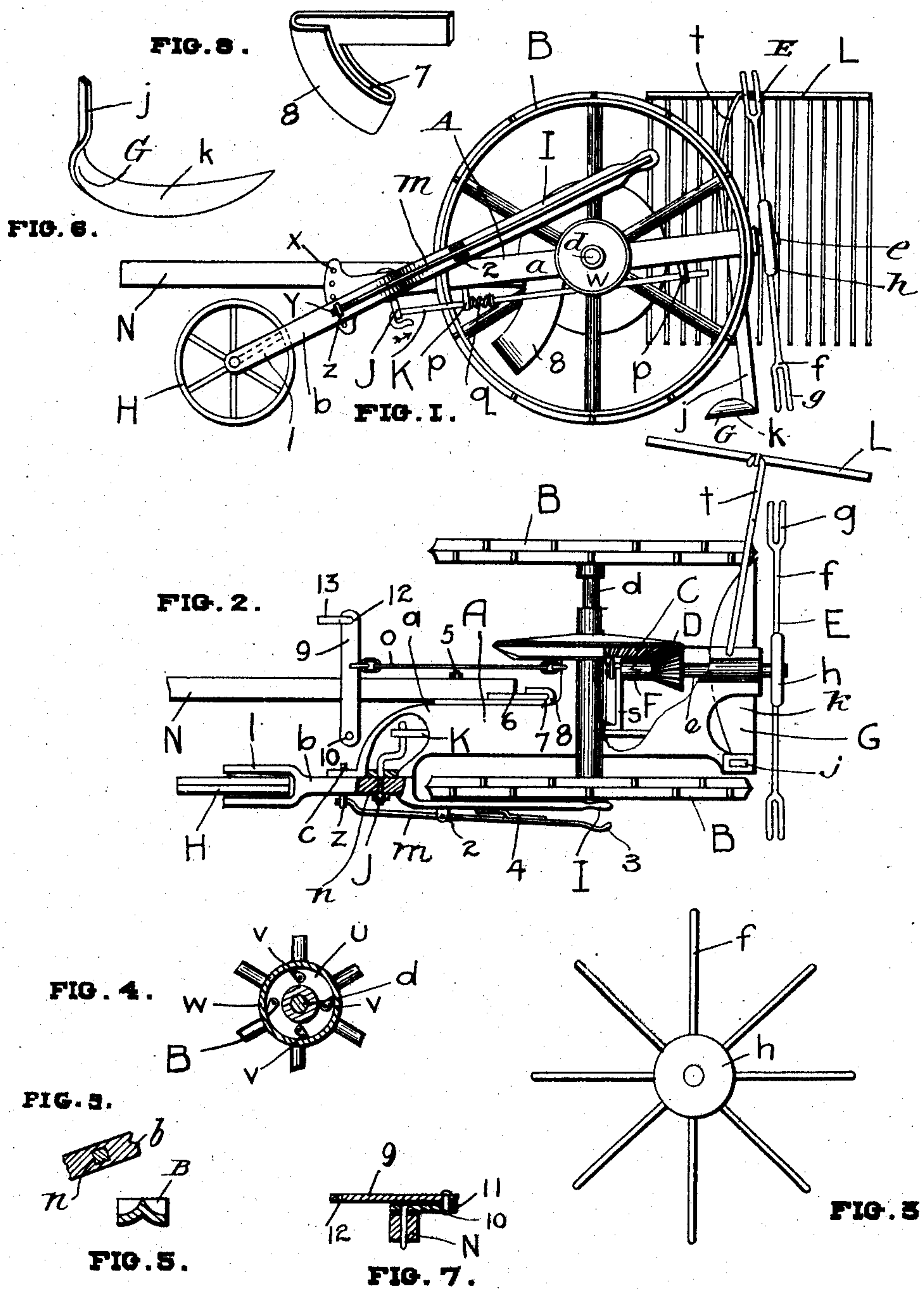


No. 864,234.

PATENTED AUG. 27, 1907.

W. J. ELLARD.
POTATO DIGGER.

APPLICATION FILED JAN. 25, 1907.



WITNESSES

Wm. A. Wyman
R. Smart

INVENTOR
W. J. ELLARD

BY *Frank R. Huntington*

ATT'Y.

UNITED STATES PATENT OFFICE.

WILLIAM JOHN ELLARD, OF OTTAWA, ONTARIO, CANADA.

POTATO-DIGGER.

No. 864,234.

Specification of Letters Patent.

Patented Aug. 27, 1907.

Application filed January 25, 1907. Serial No. 354,064.

To all whom it may concern:

Be it known that I, WILLIAM JOHN ELLARD, of the city of Ottawa, in the county of Carleton, Province of Ontario; Canada, have invented certain new and useful

Improvements in Potato-Diggers, of which the following is the specification.

My invention relates to improvements in potato diggers of the class in which the potatoes are dug by means of a plurality of arms rotating in a plane transverse to the direction of movement of the digger and the objects of my invention are to simplify the operation of the device and to enable the digging arms to be automatically thrown into operation simultaneously with their lowering to engage the ground, further objects being to provide means for plowing the ground before the digging mechanism operates thereon, and it consists essentially of the construction and arrangement hereinafter more fully set forth in the specifications and specifically pointed out in the claims.

Figure 1 is a side view of my improved potato digger. Fig. 2 is a plan view of the same. Fig. 3 is an end view of the digging arms. Fig. 4 is a sectional view through the hub of one of the driving wheels. Fig. 5 is a sectional detail view through the rim of one of the driving wheels. Fig. 6 is a perspective view of the end of the plow placed before the digging mechanism. Fig. 7 is a sectional view through the equalizing device secured to the pole. Fig. 8 is a perspective view of the casting forming the arc shaped slot in which the end of the pole oscillates. Fig. 9 is a sectional detail of the connecting crank between the two parts of the frame.

In the drawings like letters of reference indicate corresponding parts in each figure.

A is the frame of the machine which in accordance with my invention is made in two parts, *a* and *b*, pivoted together at *c*. The member *a*, which is the main or central portion of the frame, is supported from the driving wheels B by means of the axle *d*. On the axle is secured the operating gear C rotating therewith, which is engaged by the pinion D supported on a longitudinally extending shaft *e* which is journaled in the frame. This shaft extends beyond the frame at the rear thereof and to the extreme end is secured the digging means E. This means, as in the embodiment shown, comprises a plurality of radial digging arms, the ends *g* of which are made bifurcated as shown, the said arms being all secured to a central portion *h* which rotates with the shaft. The pinion is thrown in and out of gear by means of a clutch mechanism F automatically operated when the digging mechanism is lowered by means hereinafter described.

Immediately in front of the digging arms at the bottom thereof is a transversely extending plow shovel G which is supported from the frame by means of a standard *j*. The blade *k* of this plow is made of the curved form indicated adapted to simply pass through the

earth and loosen it prior to the operation of the potato digger.

The member *b* of the frame has the front part *l* thereof bifurcated, as shown, and within this bifurcated portion is journaled a small guiding and supporting wheel H. Near the pivoting point of this member of the frame an operating lever is formed integral with or secured to it. The pivoted connection between the two parts of the frame is formed by means of the crank J extending through both parts of the frame which abut along a plane surface. The portion *n* of this crank extending through the front member *b* of the frame is made square in cross-section as shown in Fig. 9 and that extending through the member *a* is made round in section whereby when the lever I is raised which will tilt the main part of the frame the crank J will be rotated slightly. The end of the crank J is engaged by the end of a connecting rod K which is slidably supported beneath the frame by means of suitable brackets *p*, a spring *q* being placed abutting one of these brackets and a flange on the connecting rod whereby the said connecting rod will be normally resiliently held in a position nearest the rear end of the frame. This connecting rod near the end thereof has secured to it a transversely extending arm *s* which is connected to one part of the clutch F whereby the movement of the connecting rod will throw the clutch in and out of gear. The spring *q* normally holds the clutch in its closed position but it will be seen that when the lever I is raised, the rear end of the main portion of the frame will be lowered and the crank will be rotated in the direction indicated by the arrow in Fig. 1 and the clutch will be thrown into gear. In Fig. 1 my machine is represented when thrown out of gear and in Fig. 2 when in gear.

To prevent the potatoes being thrown far from the machine by the digging mechanism the usual form of screen L is loosely supported from an arm *t* secured to the frame. In the construction of the driving wheels for the machine, I form their rims of the cross section indicated in Fig. 5 whereby the stones, etc., will slide away from the wedge formed by the outside of the rim instead of raising the wheel up and tilting the machine. In place of forming a direct connection between the driving wheels B and driving shaft *d*, I preferably form the connection by the means shown in detail in Fig. 4 which allows the machine to be moved backwards without any operation of the digging mechanism. This means comprises a boss *u*, secured to the shaft *d* and rotating therewith, which has an annular recess therein in which are located a plurality of spring-held pawls *v* which bear against the inner surface of the hub *w* of the driving wheel. Thus the connection between the driving wheels and the shaft is formed by means of the spring-held pawls *v* and hence the wheels will only rotate the shaft in one direction.

To hold the two parts of the frame in any position to

which they have been adjusted I provide a plurality of holes, x , in the member a and a single hole y in the member b through which a pin z extends. This pin is pivotally connected to the end of a lever m which is
 5 pivoted to a lug 2 on the frame, the end 3 of said lever extending near the end of the lever I whereby it might be easily grasped in operating the machine. The end of the lever 3 is held in its outermost position by means of a spring 4 secured to the frame and abutting the
 10 lever. By this means the pin z is always resiliently held in its engaged position.

The draft pole N is pivoted to the frame at 5. To steady the operation of the same, I secure to the end of the pole a projecting plate 6 which extends into a groove
 15 7 provided in a casting 8 secured to the frame. This groove is made arcuate in form as shown in Fig. 8 whereby it will always engage the projection plate 6 on the oscillation of the pole. The draw-bar o is pivotally connected to the frame and to a cross-bar 9, one
 20 end of which is pivoted at 10 to a plate 11 which laterally extends to the pole. The opposite end 12 of the cross bar is pivotally connected to the drawing rope or chain 13 and by this means an equalization of the pull is secured. Any other form of suitable draft equalizing
 25 device, however, might be employed in connection with my machine.

In the operation of my machine when it is desired to throw the machine into operation, the end 3 of the lever M is pressed inwardly and the lever I is raised,
 30 which will tilt the members of the frame and lower the arms of the digging mechanism into the ground. When they have been lowered sufficiently the pressure on the lever m may be released which will enable the pin z to slide into one of the holes x thus locking the two
 35 parts of the frame in position together. At the same time as this operation has taken place, the crank J has been oscillated by the tilting of the member b which will move the connecting rod K and throw the clutch F into its engaged position which will place the pinion
 40 D in engagement with the gear C and thus on the forward movement of the machine the digging arms E will be rotated.

It will thus be seen that I have devised an exceedingly cheap and simple potato digger in which the
 45 operation of lowering the potato digger into the ground and throwing it into gear are accomplished by the operation of one lever.

Although I have described with great particularity of detail one specific embodiment of my invention yet
 50 it is not to be understood therefrom that the invention is limited thereto as various changes might be made therein without materially departing from the spirit of the invention.

What I claim as my invention is:—

55 1. In a potato digger the combination with the driving wheel and digging mechanism operated thereby, of a frame comprising two members pivoted together, and means whereby the tilting of one member with regard to the other throws the potato digging mechanism in and out of gear
 60 as and for the purpose specified.

2. In a potato digger, the combination with the driving

wheels and digging mechanism operated thereby, of a shaft connecting the driving wheels, a frame supported thereby consisting of a front and rear member pivoted together, a forward wheel supported on the front member of the frame, a lever for tilting the front member of the frame and lowering the rear end thereof and means operated by the tilting of the front member of the frame for throwing the digging mechanism in and out of gear, as and for the purpose specified.

3. In a potato digging mechanism, the combination with the driving wheels, the shaft connecting the same, a frame supported thereon consisting of a front and rear member pivoted together, of a potato digging mechanism, means for driving the same from the shaft, a clutch throwing said driving mechanism in and out of gear, a front wheel supported by the front member of the frame, a crank forming the pivotal connection between the two members of the frame, a lever secured to the front member of the frame for tilting the same, and means for causing the crank to operate the clutch when oscillated by the tilting of the front member of the frame, as and for the purpose specified.

4. In a potato digger the combination with the driving wheels and potato digging mechanism operated thereby of a frame comprising two members pivoted together, a crank oscillating with one member and forming said pivotal connection and means operated by the oscillation of said crank for throwing the digging mechanism in and out of gear with the driving wheels as and for the purpose specified.

5. In a potato digger the combination with the driving mechanism and potato digging mechanism operated thereby, of a frame comprising two members having abutting flat surfaces, a pivotal connection between said members at their abutting portions and means for holding said members of the frame in any position in which they may be relative to each other as and for the purpose specified.

6. In a potato digging machine the combination with the driving wheels, a shaft connecting the same, of a frame comprising two members pivoted together, a crank forming said pivotal connection, a digging mechanism, a driving mechanism connecting the same with the shaft, a clutch for throwing said driving mechanism in and out of gear, a connecting rod secured to said crank, an arm connecting one end of the connecting rod to the clutch whereby the movement of the connecting rod will throw the clutch in and out of gear, a wheel supporting the forward member of the frame, and an operating lever secured to the forward part of the frame adapted to tilt the frame as and for the purpose specified.

7. In a potato digger the combination with the driving mechanism, and potato digging mechanism operated thereby, of a frame comprising two members having abutting flat surfaces, a pivotal connection between said members at their abutting portion, locking means for holding said members in any position in which they may be placed relative to each other and a hand operated lever for removing said locking means as and for the purpose specified.

8. In a potato digger the combination with the driving mechanism and potato digging mechanism operated thereby of a frame comprising two members having abutting flat surfaces, a pivotal connection between said members at their abutting portion means for locking said members in any position in which they are placed relative to each other, resilient means for normally holding said locking means in position and a hand operated lever for temporarily withdrawing said locking means as and for said purpose specified.

Signed at Ottawa, in the county of Carleton, Province of Ontario, Canada, this 21st day of January, 1907.

WILLIAM JOHN ELLARD.

Witnesses:

RUSSEL S. SMART,
 WM. A. WYMAN.