

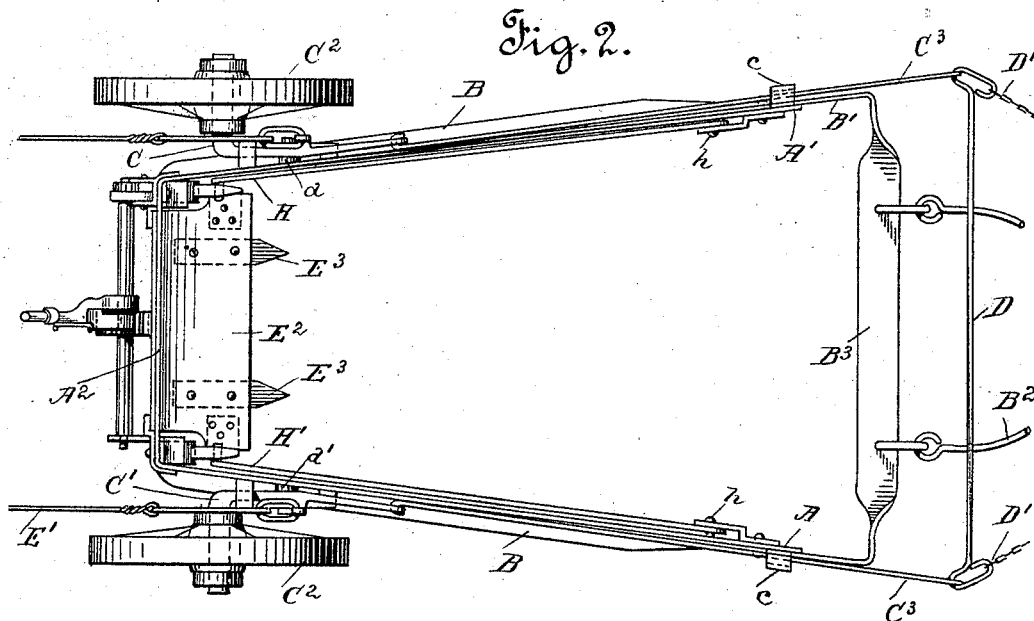
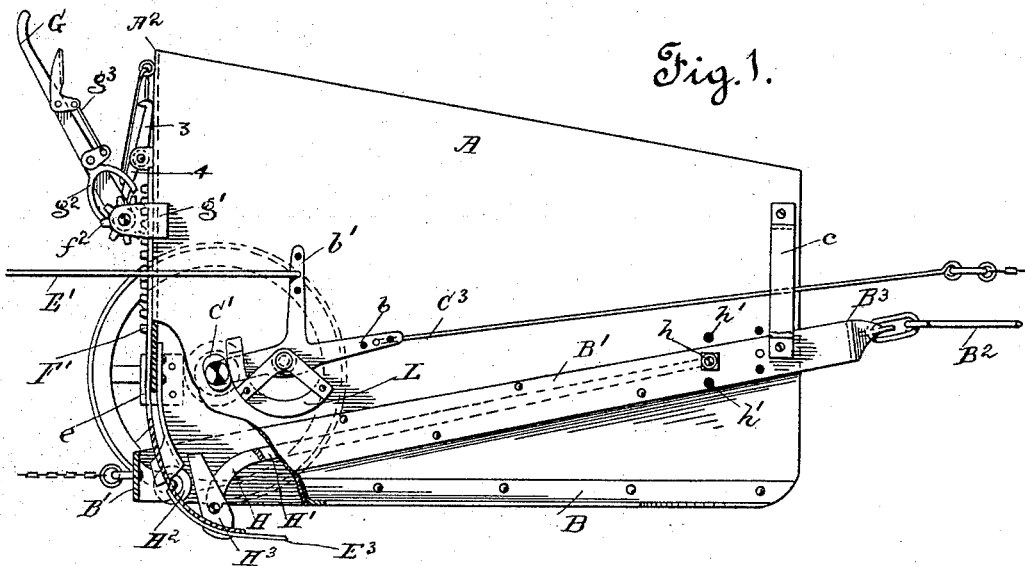
(No Model.)

2 Sheets—Sheet 1.

A. F. BERNARD.
EARTH SCRAPING MACHINE.

No. 526,675.

Patented Oct. 2, 1894.



Witnesses.
J. H. Forteverde
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Inventor.
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Att'y.

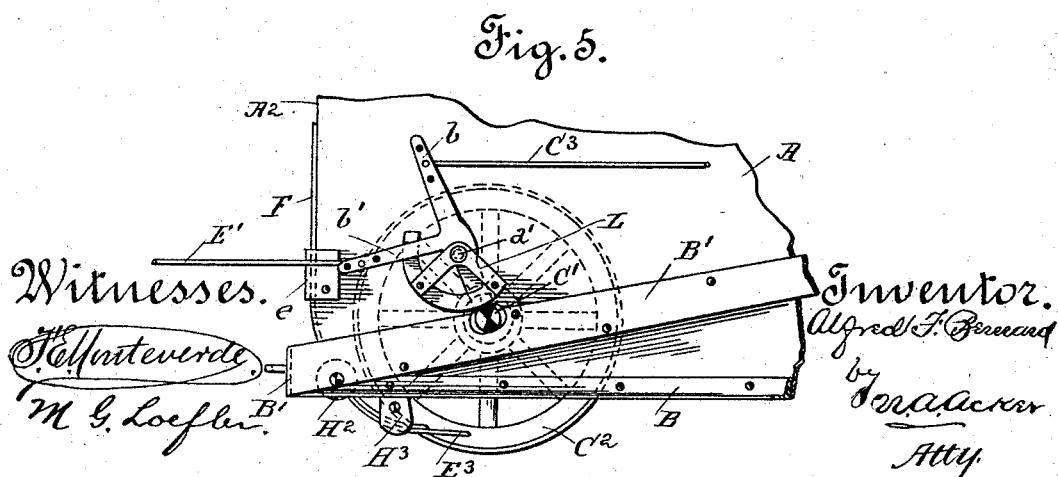
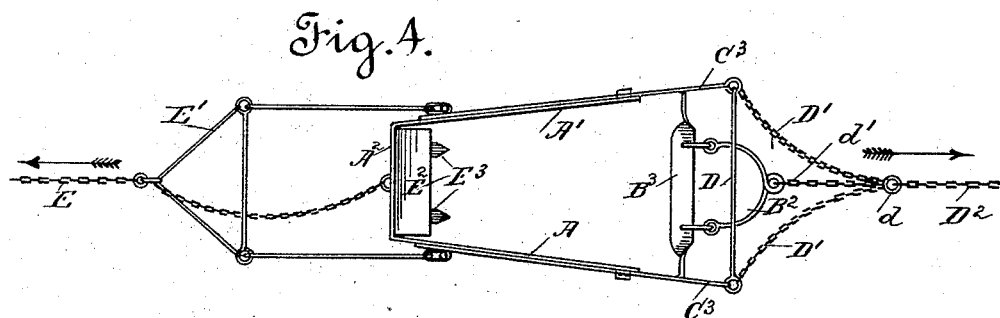
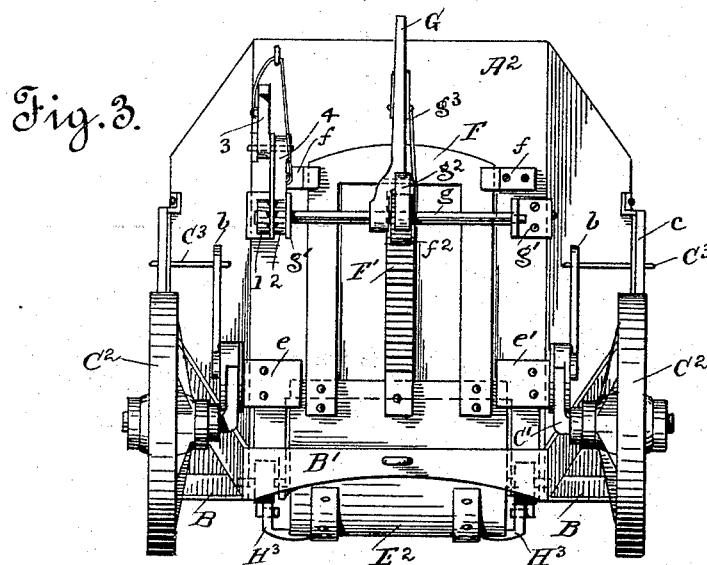
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2 Sheets—Sheet 2.

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UNITED STATES PATENT OFFICE.

ALFRED F. BERNARD, OF SAN LUIS OBISPO, CALIFORNIA.

EARTH-SCRAPING MACHINE.

SPECIFICATION forming part of Letters Patent No. 526,675, dated October 2, 1894.

Application filed October 11, 1893. Serial No. 487,797. (No model.)

To all whom it may concern:

Be it known that I, ALFRED F. BERNARD, a citizen of the United States, residing at San Luis Obispo, in the county of San Luis Obispo and State of California, have invented certain new and useful Improvements in Scraping-Machines; and I do hereby declare the following to be a full, clear, and exact description of said invention, such as will enable others skilled in the art to which it most nearly appertains to make, use, and practice the same.

This invention relates to a certain new and useful dirt scraper, designed more especially for use in connection with the work of grading and filling in, and it consists in the arrangement of parts and details of construction as will be hereinafter more fully set forth in the drawings, described and pointed out in the specification.

The main feature of my invention consists in forming the scraper body with diverging side walls in order to remove the strain from the forward part thereof and cause the full force of the resistance, offered to the forward movement of the scraper, to fall upon the lower end of the rear wall, so as to force the plow points firmly into the soil; in mechanism for giving adjustability to the plow or cutting blade for the purpose of regulating the depth of its penetration into the soil; the wheels mounted upon swinging axles for raising and lowering the scraper body; and of mechanism for automatically raising and lowering the supporting wheels and lowering and raising the scraper body with the forward or backward movement of the scraper.

In order to more fully understand my invention, reference must be had to the accompanying sheets of drawings, wherein—

Figure 1, is a vertical side elevation showing the body in its lowered position and partly broken away, one of the supporting wheels removed. Fig. 2, is a top plan of Fig. 1. Fig. 3, is a rear elevation, showing fully the mechanism for raising and lowering the plow or cutting blade. Fig. 4, is a diagrammatic plan view; and Fig. 5, is a broken detail side elevation showing the position of the supporting wheels when the body is raised, and the mechanism whereby the wheels are lowered

and raised, being the opposite to that disclosed in Fig. 1.

The scraper body is composed of the side walls A, A', and back plate A², the top and bottom of the scraper being left open. The sides, as will be noticed from Fig. 2, diverge. Consequently the forward or entrance portion thereof is a greater distance apart than the rear end. This is for the purpose of preventing the dirt as accumulated from clogging and binding at the entrance of the scraper, which it will do if the side walls run parallel, after the body has become partially filled. By making the walls diverging, the dirt forced therein will not clog or bind. Hence the full force of the resistance will fall upon the lower end of the back plate and the strain thereof serve to force the cutting blade or points into the ground, the result desired by the forward movement of the scraper. By preference, the body is formed of sheet metal, and the sides and back plate of one piece, although they may be made separate and united in any suitable manner.

In order that the bottom edge of the sides may not cut into the earth as dragged forward, which if allowed so to do would cause the spreading and possible breaking of the side walls, I secure thereto the outwardly flanged shoe or flange B, which may be alluded to as a drag runner. However, the same result may be accomplished by outwardly flanging the lowered edge or bottom of the side walls.

For the purpose of greater strength, there is secured around the scraper body, as shown, the metallic band or strap B', which is bolted or otherwise fastened to the sides and end wall, the forward ends of which strap or band project beyond the forward or front edge of the side walls and are united by the cross-bar B², from which projects the draft bail B³. From the sides A, A', near the rear end thereof, projects the short arms a, a', upon which the bell-crank levers are secured. The lower end of the said levers terminate in the axles C, C', upon which the supporting wheels C², are secured. These axles are provided with the oval shaped shoulders against which the inner face of the wheel hub bears, when the wheels are secured upon the axles by the

lock nut. My object of making the axle shoulders of oval shape, as shown in Figs. 1 and 5, is to reduce the distance from the fulcrum point of the bell crank levers and to permit of the shoulders of the axles to clear the quadrant L, as the levers are thrown so as to raise or lower the lower end thereof. The quadrant L, is rigidly secured to the short arms a, a' . To the arms b , of the crank lever, I fasten the forwardly extending rods C^3 , which work within the guide c , and project beyond the side walls. The free ends of these rods, I connect by cross rod D, as shown, from which bar extends the chains D' , which unite at the ring d . To this ring is attached the draft chain D^2 , which leads from one drum of an engine, not shown. The draft bar bail is connected to this ring by a short chain d' . The rods C^3 and chain D' , are for the purpose of throwing the crank levers forward in order to raise the supporting wheels free of the ground, so as to allow the scraper body to rest thereon, as a forward strain is exerted upon the draft chain in order to drag the scraper forward. As the scraper is moved forward, by the winding of the draft chain over one of the engine drums, the dirt is collected in the body thereof. When the scraper has been moved forward to the place of dump, the body or scraper is not tilted or swung over in order to discharge the accumulated dirt therefrom, but is simply drawn backward by the winding of the draft chain E, over one of the engine drums, which imparts an opposite movement to the scraper to that given by winding of chain D^2 . The chain E, is connected to the band or strap B' , as shown. This chain is also connected to the bail E' , which is fastened to the arms b' , of the crank lever. Consequently as the draft chain is drawn taut the bail moves therewith, and the movement thereof imparts an opposite throw to the crank levers, which causes the axles C, C' , to move downward, carrying therewith the supporting wheels. As the supporting wheels contact with the ground, the rear end of the scraper body is raised or lifted from contact therewith. The scraper body being thus elevated the contents thereof are readily discharged as the body is moved rearward, there being no bottom thereto.

By providing the supporting wheels less power is required to draw the scraper backward than when it is permitted to drag. Besides the cutting blade being lifted clear of the ground unnecessary wear thereof is obviated. It will be noticed that the raising and lowering of the scraper body, through the lowering and raising of the supporting wheels, is automatic with the forward or rear movement of the scraper.

The lower portion of the back plate A^2 , is cut away in order to leave an open space within which the mold board E^2 , moves up or down. To the bottom of this board I secure the plow points E^3 . However, if desired, this portion of my device may consist of an integral

cutting plate or blade, and hereinafter I shall refer to the same simply as a cutting blade as meaning either. The top of the cutting blade, see Fig. 3, works in guides e, e' , the band or strap B' , forming a lower guide for preventing the blade from being displaced by the strain thereon, as the scraper is moved forward. To the top of the cutting blade is bolted the plate F, which works against the back plate of the scraper and within guides f . I also fasten to this plate and the cutting blade, the rack bar F' , which is for the purpose of giving vertical movement to the cutting blade in order to increase or decrease the depth of its cut. This plate is given a vertical movement through the medium of the cog wheel f^2 , secured to the shaft g , which shaft rotates in bearing g' , fastened to the back plate of the scraper. See Fig. 3. The teeth of this cog wheel mesh with the teeth of the rack bar, and as the same is given an up or down rotation, the cutting blade is lowered or raised. This cog wheel, or the cross shaft, is rotated by means of the lever G, which carries a double pawl g^2 , for engaging with the teeth of the cog wheel. This pawl is thrown in or out of engagement by the spring rod g^3 .

The cutting blade is held firmly in position by means of the rods H, H' , secured thereto by means of yoke plates H^2 slightly above the cutting edge of the blade. These rods extend forward and are fulcrumed to the inner face of the side walls of the scraper by bolts or pins h , which fit through one of the holes h' . When these rods are thus secured the cutting blade can only be lowered a given distance. By changing the position of the rods so as to bring the pins or bolts in either the upper or lower holes the angle of the rods will be increased or decreased, thus limiting or increasing the cutting depth allowed the cutting blade.

In order to facilitate the vertical movement of the cutting blade and reduce friction thereof, I secure within suitable bearing, at the lower corners of the back plate, the rollers H^2 , upon which bear the yoke plates H^3 . These plates project upwardly from the cutting blades and to the same I secure the rear end of the rods H, H' .

In order that the cutting blade may be held in its adjusted position, I secure to one end of the cross shaft g , the ratchet wheels 1, 2, the teeth of which are engaged by the dogs 3, 4. These dogs serve to hold the shaft from rotation or movement when the position of the cutting blade has been regulated.

In front of the crank levers, I locate the quadrant L, with which the rear arm of the swinging levers engages when the supporting wheels are lowered and holds the same locked until removed by the forward throw of the crank levers.

Having thus described my invention, what I claim as new, and desire to secure protection in by Letters Patent, is—

1. In a scraper, the combination with the

body, the crank lever secured to the sides thereof, the supporting wheels connected to and carried by the swinging levers, the forwardly extending rods secured to the forward arms of the crank lever, the bail connected to the rear arms of the crank levers, and the cables for throwing the crank lever in order to raise and lower the supporting wheels with the forward and backward travel of the scraper.

2. The combination with the body, composed of side and end walls or plates, the side walls diverging, the cutting blade connected to the bottom of the rear wall, the runners secured to the bottom edge of the side walls, the cables for moving the scraper forward and backward, and the wheels secured to the body so as to have a vertical movement in order to raise or lower the body, said wheels connected to the draft cables so as to be automatically raised or lowered with the forward or backward movement of the scraper.

3. In a scraper, the combination with the body thereof, the movable cutting blade, mechanism for imparting vertical movement thereto, the yoke projecting upwardly from the cutting blade, and the rollers upon which said yokes bear as the cutting blade is raised or lowered in order to reduce the friction of its movement.

4. In a scraper, the combination with the

body thereof, the movable cutting blade, the guides in which it works secured to the back plate, the plate connected to the cutting blade, guides in which said plate works, rack bar secured to the plate and cutting blade, cog wheels for engaging with the rack plate mounted upon a cross shaft working in bearing attached to the back plate, the lever for imparting motion to the cog wheel in order to raise or lower the cutting blade, and the pawls for engaging with the cog wheel.

5. The combination, in a scraper, of the body, the swinging crank levers secured to the sides thereof, the supporting wheels connected to said crank levers, mechanism for automatically raising and lowering said wheels with forward and backward travel of the scraper, a device for locking the crank levers when the same have been thrown backward in order to lower the supporting wheels, the cutting blade secured to the body, mechanism for raising and lowering said blade, and the rods for holding the blade and regulating the movement thereof.

In testimony whereof I affix my signature in presence of two witnesses.

ALFRED F. BERNARD.

Witnesses:

N. A. ACKER,

DANIEL HANLON.