

G. D. STILLSON.
EXCAVATING MACHINE.

No. 11,949.

Patented Nov. 14, 1854.

Fig. 1.

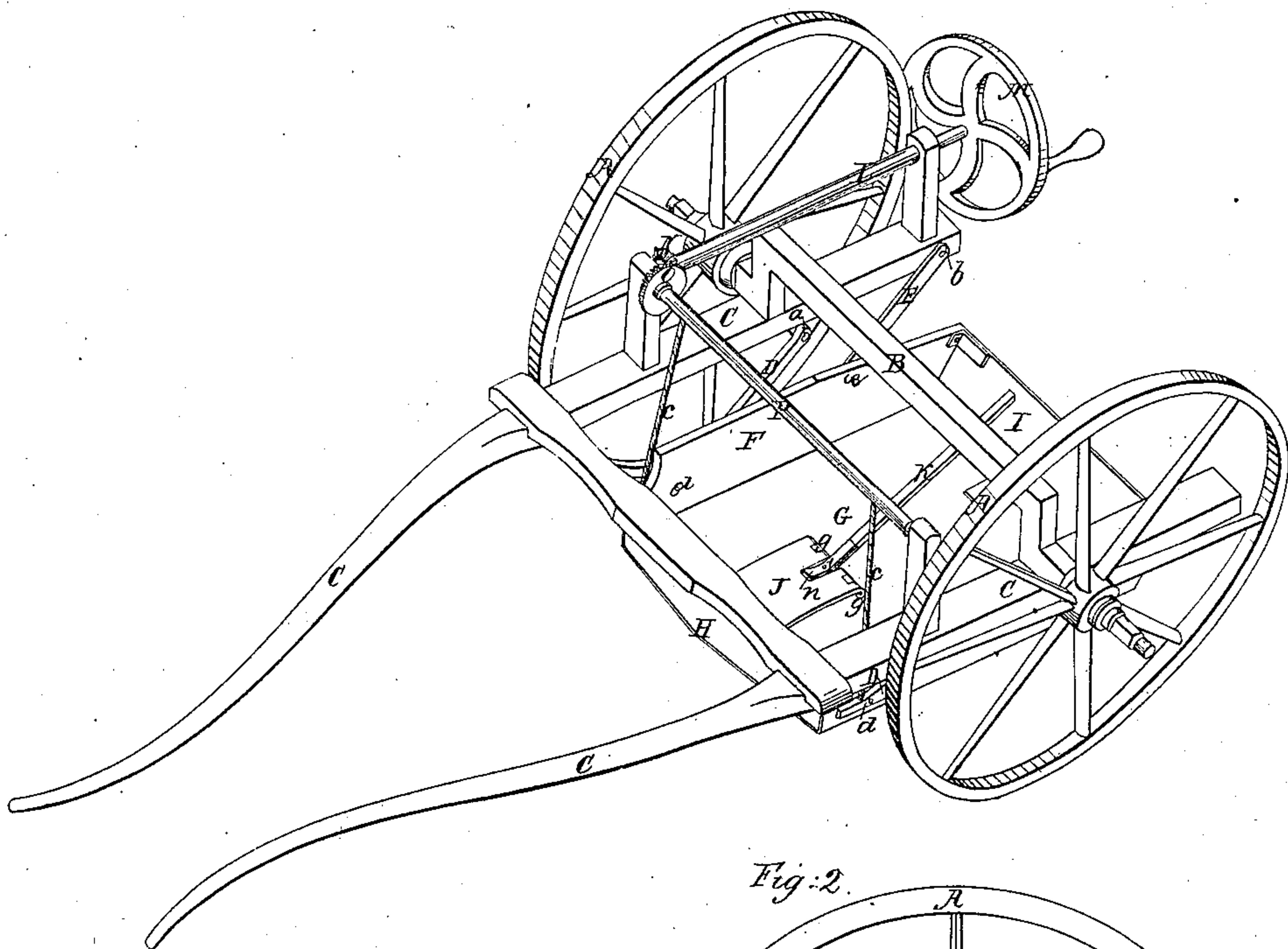
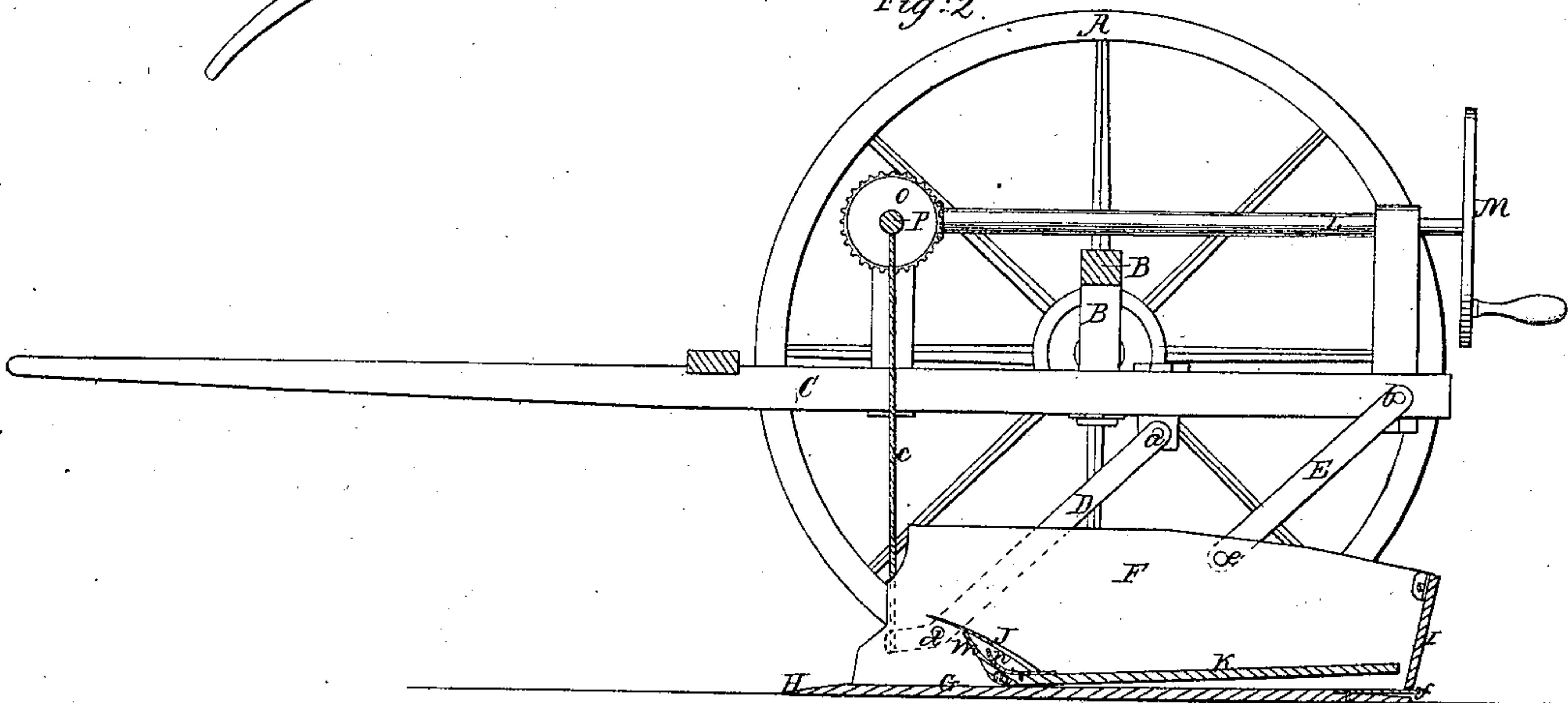


Fig. 2.



UNITED STATES PATENT OFFICE.

GEORGE D. STILLSON, OF ROCHESTER, NEW YORK.

EXCAVATING-MACHINE.

Specification of Letters Patent No. 11,949, dated November 14, 1854.

To all whom it may concern:

Be it known that I, GEORGE D. STILLSON, of Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Machines for Excavating, Transporting, and Dumping Earth, which I term an "Excavator;" and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part thereof, in which—

Figure 1, represents a perspective view, and Fig. 2, a longitudinal and vertical section through the center of the same.

Similar letters where they occur in the figures denote like parts.

The nature of my invention relates first, to the controlling of the cutting or scraping edge of the excavator, so as to keep it always at, or about the same relative position in regard to the earth to be removed, and yet be raised or lowered to ease said cutting edge, when too powerfully resisted, and thus materially aid the scraper in entering and passing through the earth which is to be raised up onto it. Also, in the so hanging of the scraper to the frame or axle which supports it by means of pivoted radial arms or braces, as that said scraper with the earth thereon, may by a hand wheel or other equivalent device, be first raised up horizontally or nearly so, a sufficient distance to suspend it on the wheels by which it is to be drawn away, and by continuing to raise it by the same means, may be tilted and dumped. Also in the attaching of the scraper to the wheels, truck or frame, by rigid arms, so that the entire weight of the carriage and load upon it, may be employed in holding the scraper to its work. Also, in the use of a breaker placed at or near the front of the scraper, for the purpose of loosening up the earth, and facilitating its progress to the rear of the scraper, and to prevent packing or clogging in the front of the scraper.

To enable others skilled in the art, to make and use my invention, I will proceed to describe the same with reference to the drawings.

A A, represent a pair of supporting wheels, in which are suitably arranged a bent axle B, for giving space to operate the scraper underneath it. To this axle is firmly attached the shafts C, the two supporting the several other parts of the ma-

chine. To the rear parts of each of the shafts are pivoted or hinged the bars or braces D, E—the one (D) being pivoted at *a*, and the other (E) at *b*,—the lower ends of said bars or braces being respectively pivoted or hinged to the sides F of the scraper at *d*, *e*, so that they together with the cords or chains *c*, *c*, shall suspend and hold suspended at any desired point, the scraper G.

It will be perceived that the points of suspension *a*, *b*, are not in the same plane, nor are those *d*, *e*, and yet the two pairs of bars or braces D, E, are of the same or nearly of the same length. The object and design of so suspending, is to cause the scraper to first rise horizontally, and remain in that position while being hauled off upon the truck or wheels, and then by continuing to raise up, it shall be tilted and dumped.

The bars or braces D, should be rigid, that is, not flexible, because they serve as radial arms on which the body of the scraper is controlled. The bars or braces E, serve rather to suspend the scraper than to hold it at any fixed point, and instead of their being rigid or nonflexible, they may be supporting chains—not so however, the arms D, it is necessary to the efficiency of the machine that they should be unyielding, for reasons that will hereafter be given.

The scraper G, may be made entirely of metal, or of wood and metal combined, and should be made a little wider in front than in the rear, for the purpose of cutting or removing a sufficiency of earth at the front, to allow the rear to pass through without unnecessary friction—the object being to cause the point or steel edge H, of the scraper, to be the only part which shall come in contact with the earth to be removed. The scraper when brought with its edge H, against the earth, is prevented from swinging backward, by the rigid arms or braces D, which tend rather, in connection with the draft of the horse or horses, to force forward said edge into the earth, while the weight of the earth aids to prevent it from rising. Indeed the whole carriage itself with its accumulating load tends to hold the scraper to its work, inasmuch as the rigidity of the arms D, will prevent the scraper from rising without raising with it the carriage and load. This controls the upward tendency of the scraper, while it cannot descend below the fixed point at which it is set on account of the chains *c*, *c*. The scraper therefore,

when suspended or set at its most effective cutting point, may be raised or lowered at pleasure, in nearly the same plane, to relieve the cutting edge, facilitate its progress through the ground, or to raise it over any obstruction, by the attendant, but it cannot run into, or out of the ground of itself, unless it takes the carriage with it. There is, therefore, a principle involved in thus hanging and controlling the scraper, which cannot be made practical when chains, cords, or flexible connections are alone used between the carriage and the scraper. The radial arm or brace combines the advantages of rigidity and adjustability, in holding and adjusting the scraper to its work, while the flexible connections have no such function, the scraper running out of the ground in defiance of the attendant.

The point *a*, is the center of motion of the scraper when raised and lowered, and when raised from its lowest position, it must advance somewhat into the resisting earth or whatever it may be worked in, and that although the rear of the scraper may slightly drop, it does not practically change the relative position of the edge of the scraper to the earth. This motion of the scraper, allows the attendant to give it all the favorable manipulations due to hand shoveling or digging, with the addition of the power and weight of the machine to aid him, and thus makes the machine in any soils entirely practical.

In ordinary hand scrapers, such as are in common use, and which have rounded runners or bottoms, when the attendant attempts by working the levers or handles to ease the scraper through the ground, the very act itself constantly changes the angle of the cutting or scraping edge, and makes it tend to run into, or out of the ground. This evil to a certain extent also attaches, to flexible connections, when the scraper is hung upon wheels, and the cutting edge is never brought or held up to its work until the chains or cords are all brought up taut, and then with such a sudden jar as to injure both the horses and the machine. By my arrangement when the cutting edge is set at its most effective cutting or scraping position, it can be raised or lowered to relieve it of undue strain, or for mounting over any obstructions without practically changing that position.

I have described the scraper as being wider in front than in the rear, so as to cut a clear way through the ground and prevent friction or dragging of the rear part. This in many soils would cause the earth to pack or clog in the front of the scraper, and prevent its sliding back into the box or body thereof. To avoid this I have arranged a breaker or agitator *J*, near the front of the scraper, which is hinged at *g*, to the bottom, and is somewhat of a shovel form, though

may be forked, or of any other convenient form. A lever *K*, the rear end of which extends back far enough to be readily caught and operated by the attendant behind the scraper, is pivoted at *i*, and projects through an opening in *J*, and has that end of it forked—one fork *n*, Fig. 2, for holding down, and the other *m*, for raising up said breaker. When the scraper is working in stiff or rugged soils, this lever is vibrated, which raises and lowers the breaker and the earth upon it, breaking up the latter, and allowing it to readily pass back into the box; and when the scraper is nearly loaded, or considerable earth resting upon the agitator *J*, the lever *K*, may be pressed down, until its arm or fork *n*, ceases to act on the breaker, when the earth passing under it, will turn it backward, and cause it to force back the earth lying upon or immediately in rear of it, into the body or rear of the scraper, from whence it is more readily dumped or delivered. The rear part of the scraper may be furnished with a hinged door *I*, and a catch *f*, to facilitate the dumping or unloading of its contents.

On the right hand side of the machine (for convenience) is arranged a shaft *L*, which has upon its rear end a hand wheel *M*, and upon its front end a bevel spur gear *N*, working into another bevel gear wheel *O*, on a shaft *P*, which extends across the shafts or frame *C*, *C*. To this shaft *P*, is connected the cords or chains *c*, *c*, which are at their lower ends fastened to the scraper; and a click, stop, or catch of any kind may be connected to either of the shafts *L*, *P*, or to the hand wheel, so as to hold the scraper when desirable at any fixed point of suspension from the wheels or frame. By turning the hand wheel *M*, the scraper with its load will rise horizontally, or nearly so, to such a height as will admit of its being drawn off the ground by the wheels *A*; and when it has arrived at the place where the earth is to be deposited, by continuing to turn said hand wheel in the same direction, the scraper will rise until the points of suspension *a*, of the radial arms *D*, and the points *e*, *e*, at which the cords or chains are connected to the scraper, rise to nearly the same horizontal plane. When at this point, the pivots *a*, become the center of motion and the front of the scraper rises rapidly, and the rear as rapidly drops, until it stands at such inclination, as to readily allow the earth to slide off the door or tail board *I*, if used being first tripped, or loosened from its catch. As a modification of the hand wheel, and gearing as represented, a lever and rock shaft, may be used for raising the scraped, or a toothed rack and segment, but all these, so long as the cutting edge is under the control of the attendant, with the means of applying the power and weight of the machine

and its load, to holding said edge to its work, are but mere changes of well known raising machinery, without altering or changing the general character of the machine.

The rigid arms, as a means of connection between the carriage and scraper, perform several important functions viz: they keep the scraper firmly to its work, possessing all the advantages of rigidity and adjustability; they allow the edge to be worked or controlled, so as to relieve it from undue resistance, whilst it may have all the motions of hand shoveling; they allow the body to be raised and held up in a horizontal position, or nearly so, so that it may be hauled off, and finally, they so incline the scraper as to admit of its being readily dumped, and thus make effective by simple means, a very desirable implement.

Having thus fully described the nature of my invention what I claim therein as new and desire to secure by Letters Patent is—

1. The controlling of the cutting edge of the excavator, so as to keep it always at, or about the same relative position in regard to the earth to be removed and yet admit of being raised or lowered to ease said cutting edge, when too powerfully resisted, and thus materially aid the scraper in entering and

passing through the earth to be removed, by means substantially such as described.

2. I also claim the so hanging of the scraper to the frame which supports it, by means of pivoted radial arms or braces, as that said scraper and the earth thereon, may by the turning of a hand wheel or other equivalent device, be first raised up horizontally or nearly so, a sufficient distance to admit of its being drawn away, and then by continuing to turn said hand wheel or other raising power, to gradually tilt and dump the scraper, substantially as described.

3. I also claim the hanging of the scraper to the frame or truck by means of rigid arms, so as to employ the entire weight, of the carriage and load upon it, in holding the scraper to its work.

4. I also claim the use of a breaker, substantially such as described, placed at or near the front of the scraper, for the purpose of loosening up the earth and facilitating its progress to the rear of the scraper, and to prevent packing or clogging in the front of the scraper, as set forth.

GEO. D. STILLSON.

Witnesses:

A. B. STOUGHTON,
THOMAS H. UPPERMAN.