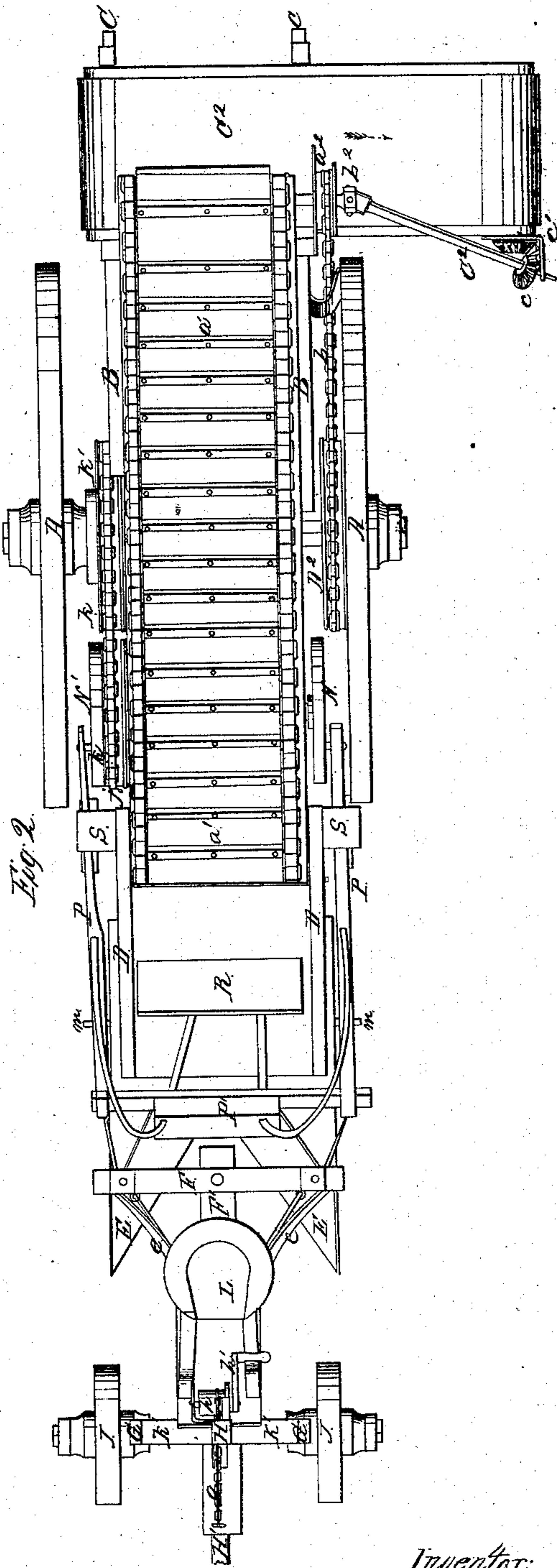
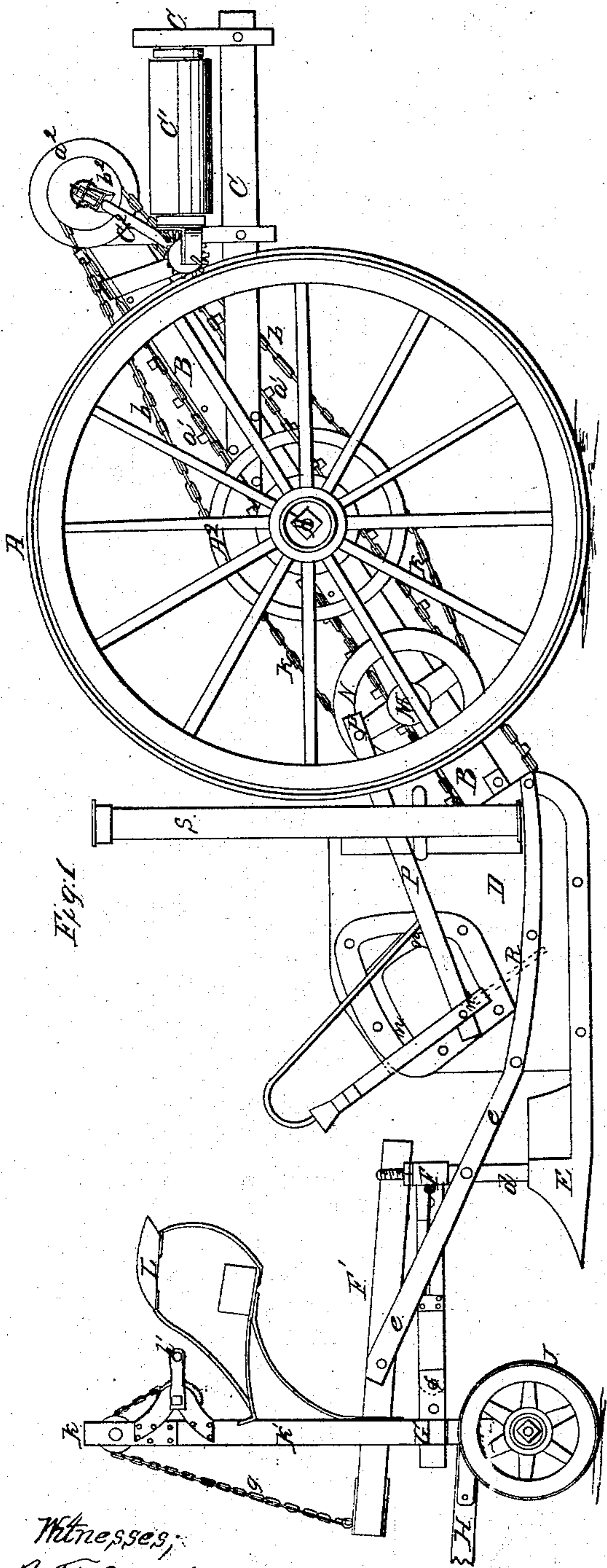


J. Bradley.

Excavator.

N^o 57,038

Patented Aug. 7, 1866.



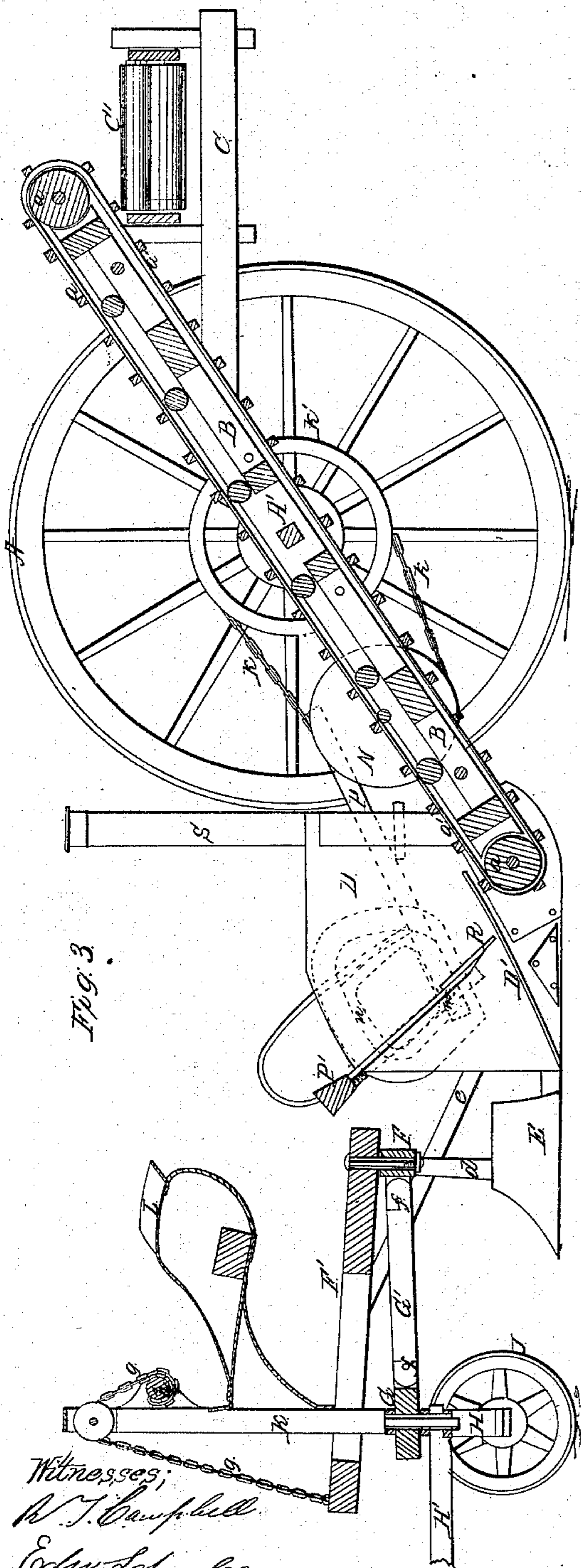
Witnesses;
R. T. Campbell
Edw. Schaefer.

Inventor;
J. Bradley
by Atty;
Mam. Smith & Co.

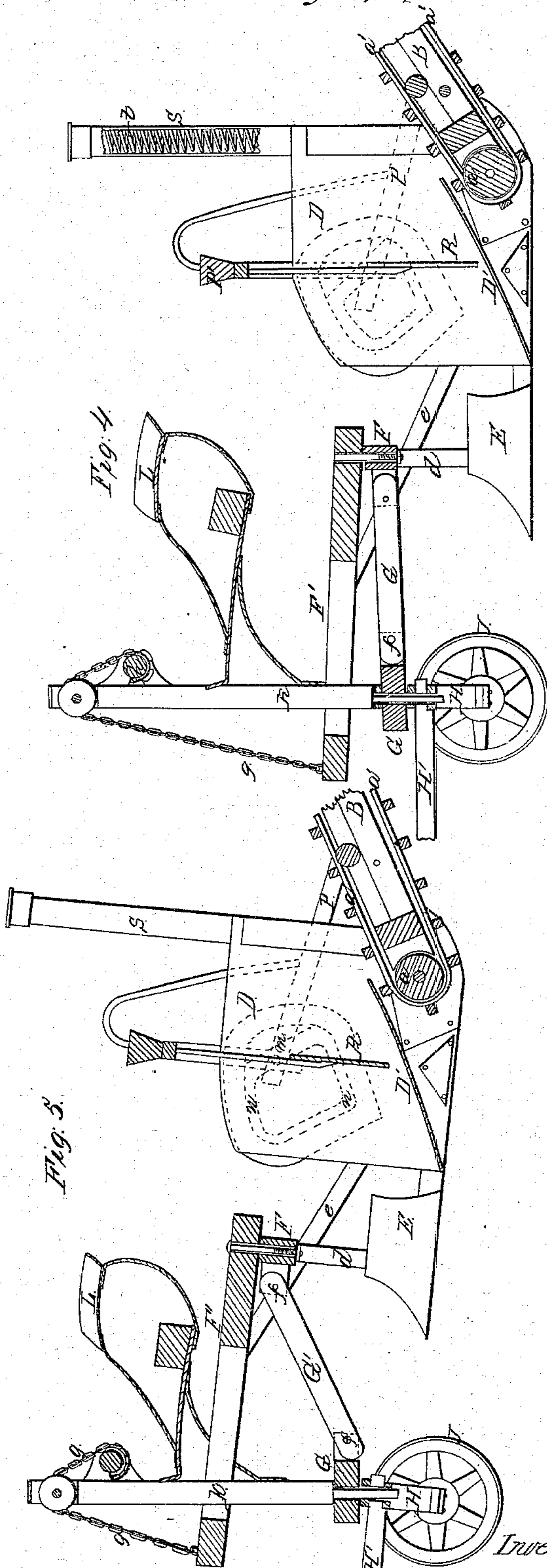
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Edw. Schaefer



Inventor,
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UNITED STATES PATENT OFFICE.

JEREMY BRADLEY, OF CEDAR FALLS, IOWA, ASSIGNOR TO HIMSELF,
WALTER PASHLEY, AND S. B. HEWETT, JR.

IMPROVED EXCAVATOR.

Specification forming part of Letters Patent No. 57,038, dated August 7, 1866.

To all whom it may concern:

Be it known that I, JEREMY BRADLEY, of Cedar Falls, in the county of Black Hawk and State of Iowa, have invented a new and Improved Excavator and Grader; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is an elevation of one side of my machine. Fig. 2 is a plan view of the same. Fig. 3, Sheet 2, is a longitudinal section, taken vertically through the center of the machine. Fig. 4, Sheet 2, is a longitudinal section, taken vertically through the center of the front part of the machine, showing the shovel moved back to the termination of its rear stroke. Fig. 5, Sheet 2, is a similar view, showing the plow elevated.

Similar letters of reference indicate corresponding parts in the several figures.

This invention relates to certain novel improvements on machines for excavating and grading; also, for digging ditches or trenches for the purpose of draining lands.

The main object of my invention is to employ a reciprocating shovel in conjunction with a scoop and elevator for the purpose of facilitating the delivery of the earth, which is gathered in the scoop upon the elevator, which latter conveys the earth to a suitable height and deposits it upon an endless apron that discharges the earth alongside of the machine, all as will be hereinafter described.

Another object of my invention is to sustain the forward part of the machine upon two transporting-wheels by means of a long tongue or lever and a chain which passes over a windlass in such manner that the driver, who is mounted upon the axle of said wheels, can elevate or depress the plow-points at pleasure, as will be hereinafter described.

Another object of my invention is to combine two turning-plows with an inclined scoop and a shovel in such manner that the plowed earth is delivered into the scoop by the plows, and thence moved backward upon the elevator by the shovels, thereby preventing the banking up of the earth in front of the machine or upon the scoop and the undue friction and resistance which would be caused by

such accumulation of earth, as will be hereinafter described.

To enable others skilled in the art to understand my invention, I will describe its construction and operation.

In the accompanying drawings, A A represent two transporting-wheels, which are made of sufficient size to support the rear part of the machine.

B B are two beams, which are secured together by transverse braces and provided with rollers *a a* at their ends, and also at intermediate points between the ends, as shown in Fig. 3. These beams B constitute a frame for supporting the endless elevating-apron *a'*, for which purpose these beams are secured to the axle *A'* of the wheels A in an inclined position. The apron *a'* is provided with transverse slots for carrying up the earth, and it is applied to the end rollers, *a a*, so as to be driven by means of a chain, *b*, which passes over a spurred pulley, *A²*, on one of the transporting-wheels, A, and also over a spurred pulley, *a²*, on the end of the uppermost roller, *a*, as shown in Figs. 1 and 2.

To the upper portion of the frame B, behind the axle-tree *A'*, a frame, C, is suitably secured for supporting an endless apron, *C'*, that is arranged at right angles to the elevating-apron *a'* and below the upper or discharging end of this latter apron. The frame C is provided with two rollers, over which the apron *C'* is stretched. One end of the frame C projects out some distance from the side of the frame B for the purpose of discharging the earth at the proper distance from the trench. This apron *C'* is moved by means of a shaft, *C²*, which is connected at one end to the center of the wheel or pulley *a²* by means of a gimbal-joint, *b²*, and at the other end it is provided with a bevel-wheel, *c*, which engages with a bevel-wheel, *c'*, on the forward end of the shaft of the outer roller, over which the apron *C'* passes, as shown in Figs. 1 and 2.

The lower end of the apron-frame B has two vertical side-boards, D D, securely bolted to it, which form two sides of the scoop, the bottom *D'* of which is inclined forward and suitably shod on its lower edge for the purpose of scooping up the earth that is loosened by the two plows E E. The rear portion of the bot-

tom of the scoop is carried over the lower portion of the endless apron a' a sufficient distance to discharge the earth upon this apron, so that it will be carried up and discharged upon the apron C' .

The two plows $E E$ are constructed with curved mold-boards, which are arranged so as to turn the earth in opposite directions toward the center of the scoop, so that the latter will gather and scrape up the earth thus loosened. The land-sides of the two plows $E E$ are in planes corresponding to the outside surfaces of the respective sides D of the scoop.

The standards $d d$ of the two plows $E E$ are secured rigidly to a transverse beam, F , at their upper ends, and to the center of this beam a longitudinal beam, F' , is rigidly secured, to which the plows are secured by braces $e e$, that extend back and are secured to the sides of the scoop, as shown in Fig. 1.

The transverse beam F is connected to a transverse bolster, G , by means of a connecting-bar, G' , the ends of which are pivoted at $f f$, as shown in Figs. 3, 4, and 5. The bolster G is pivoted in a suitable manner to the axle H of two small transporting-wheels, $J J$, to which axle a draft-tongue, H' , is applied.

In the center of the bolster G , I erect a post, K , which is strengthened by means of two braces, K' , so that it shall resist lateral strain. This post K passes through a longitudinal slot which is made through the longitudinal beam F' and prevents this beam from having any lateral play. The forward end of the beam F' has a strong chain, g , connected to it, which passes around a windlass, h , near the upper end of the central post, K . This windlass h is supported in bearings behind the post K , and provided with a crank, h' , and a pawl and ratchet, as shown in Figs. 1 and 2, so that the driver, sitting in a seat, L , can elevate or depress the forward ends of the plows and scoop at pleasure while the machine is in operation. The driver's seat L being secured to the post K , it will be seen that the driver does not lift his own weight while raising the front part of the machine.

A transverse shaft, M , is applied to the frame B near the rear end of the bottom of the scoop, and on the ends of this shaft eccentrics or crank-wheels $N N'$ are keyed. The wheel N' has a spurred pulley, j , fastened to it, over which a chain-belt, k , passes, that also passes around a spurred pulley, k' , on the transporting-wheel A .

To eccentric-pins projecting from the wheels $N N'$ pitman-rods P are pivoted, the forward ends of which are secured to a frame, P' , that extends over the scoop, as shown in Figs. 1 and 2. Through the forward ends of the rods P pins m pass and enter rectangular grooves n formed in plates which are secured to the

outer sides of the sides of the scoop. These rectangular slots form camways for guiding the frame P when the machine is in motion and giving to it a forward-and-upward movement and a backward-and-downward movement.

To the center of the transverse bar of the frame P' , I suitably secure a shovel, R , which is intended for shoveling the earth from the scoop upon the endless elevator a' . During the backward movement of the shovel the pins m are in the lower portions of the cam-slots n , and during the return strokes of the shovel said pins m move in the upper portions of the cam-slots. By this movement the shovel is caused to rise over the earth in the scoop during its backward strokes.

At the rear ends of the side-boards of the scoop two hollow posts, $S S$, are erected, the lower portions of which are slotted for the purpose of receiving the pitman-rods P . These rods are suspended by means of the springs t , Fig. 4, which are inclosed in the upper portions of the posts, which springs will lift the shovel and its frame at the termination of the forward strokes thereof to the upper portions of the slots n .

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

1. Combining with the scoop of a ditching or excavating and grading machine a reciprocating shovel which is so arranged that it will automatically keep the forward part of the scoop clear of earth, substantially as described.

2. The combination of the scoop D' and elevator a' with a shovel, R , operating substantially as described.

3. The arrangement of the plows $E E$ in front of the scoop D' , in combination with a shovel, R , and a contrivance for elevating earth, substantially as described.

4. Sustaining the forward part of the machine upon transporting-wheels J by means of the beams $F F'$, chain g , and windlass h , the latter being supported upon a post, K , which passes through a slot in said beam F' , substantially as described.

5. Connecting the transverse beam F to the bolster G by means of a jointed rod, G' , substantially as described.

6. Transmitting motion to the endless discharging-apron from the upper roller, a , of the elevating-apron a' by means of a shaft, C^2 , a gimbal-joint, b^2 , and spur-wheels $c c'$, substantially as described.

JEREMY BRADLEY.

Witnesses:

CHAS. P. BROWN,
WM. B. HUMILL.