

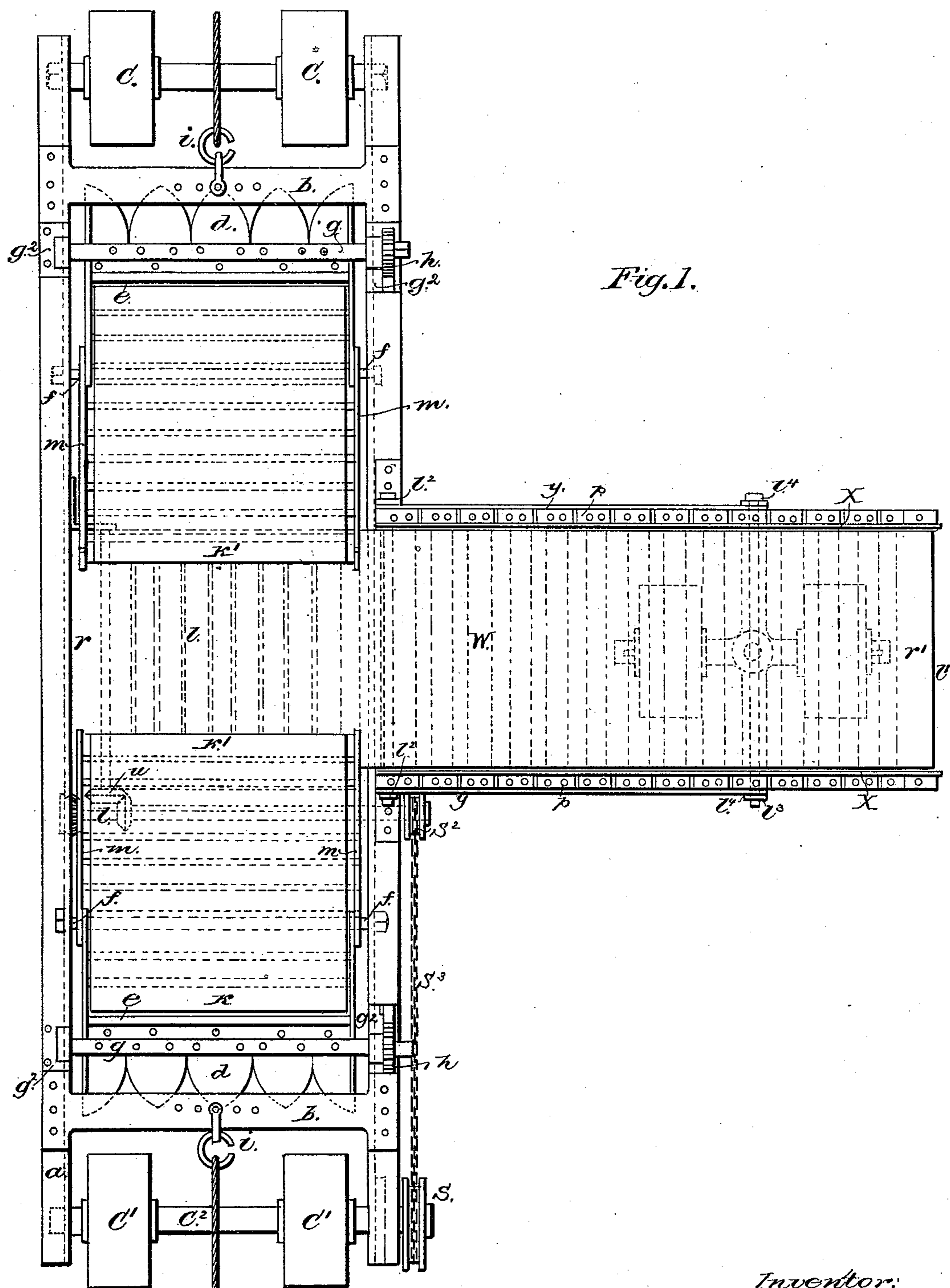
(No Model.)

3 Sheets—Sheet 1.

J. CLARK.
Excavator.

No. 234,851.

Patented Nov. 30, 1880.



Witnesses:
John F. C. Brinkert,
Edward Siggers.

Inventor:
Joseph Clark.
by W H Babcock,
Attorney.

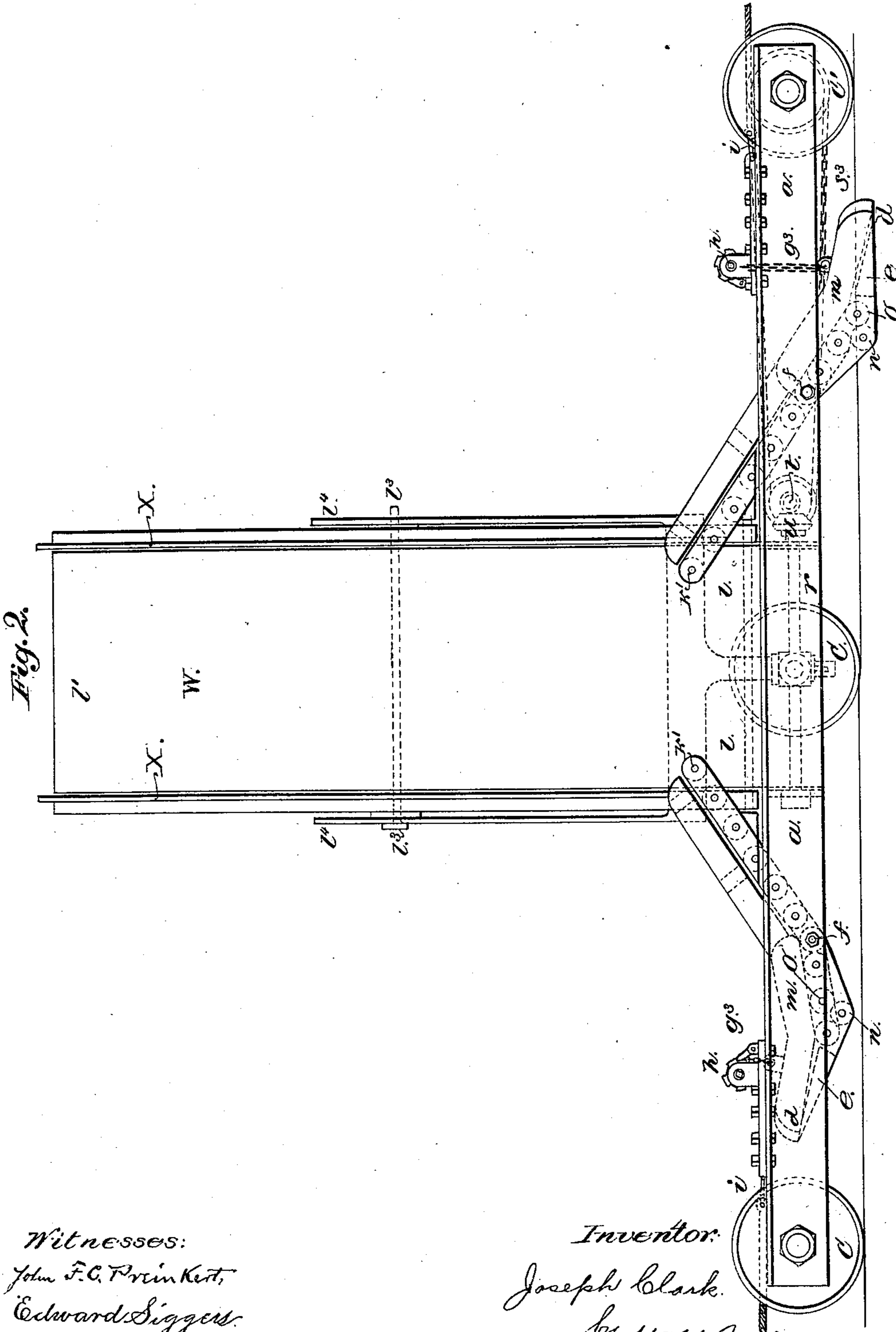
(No Model.)

3 Sheets—Sheet 2.

J. CLARK.
Excavator.

No. 234,851.

Patented Nov. 30, 1880.



Witnesses:
John F. C. Printker,
Edward Siggers.

Inventor:
Joseph Clark.
by W. H. Babcock,

Attorney.

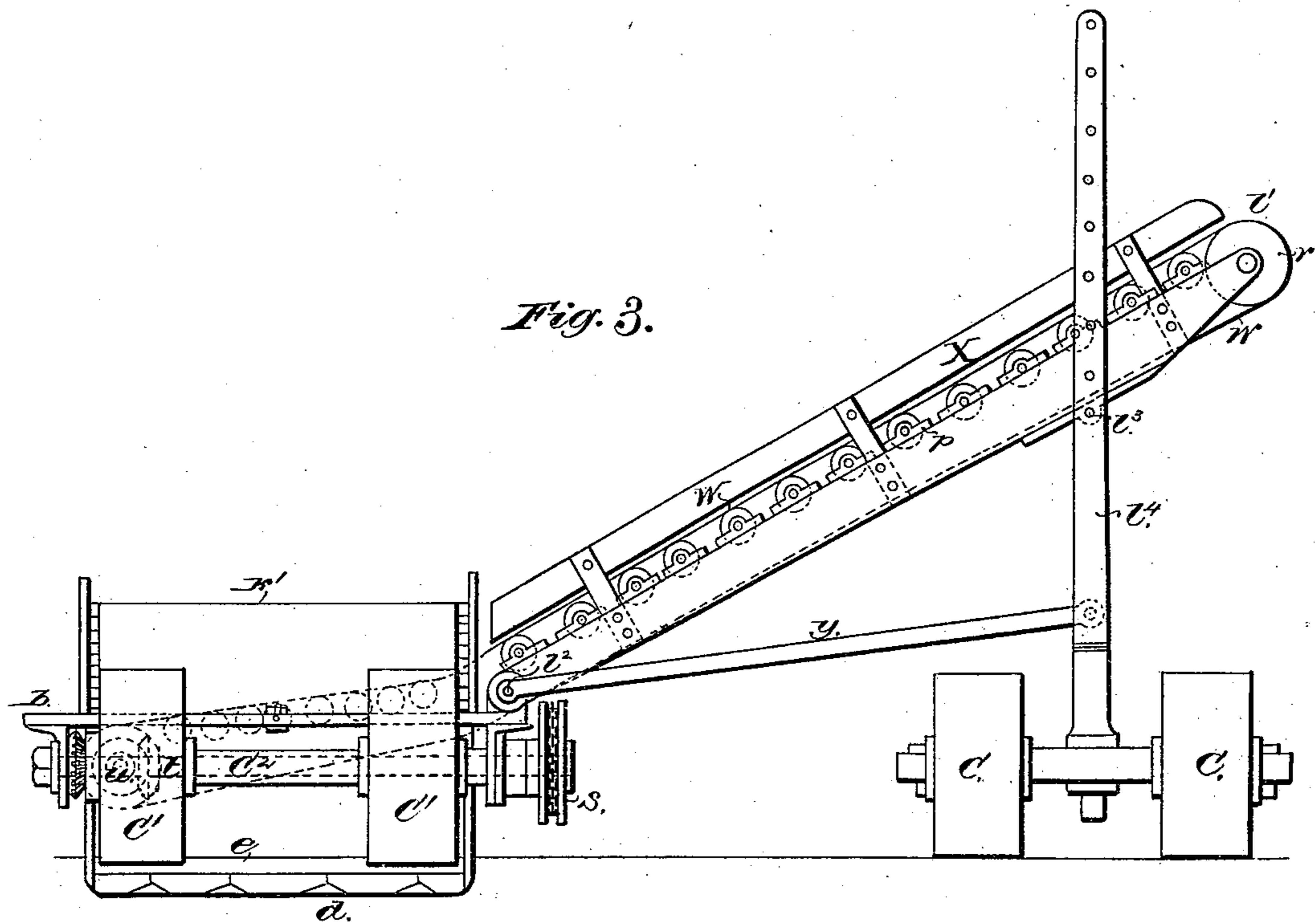
(No Model.)

3 Sheets—Sheet 3.

J. CLARK.
Excavator.

No. 234,851.

Patented Nov. 30, 1880.



Witnesses:
John F. C. Prentiss,
Edward Siggers.

Inventor:
Joseph Clark,
by W. H. Babcock
Attorney.

UNITED STATES PATENT OFFICE.

JOSEPH CLARK, OF KENSINGTON, ENGLAND.

EXCAVATOR.

SPECIFICATION forming part of Letters Patent No. 234,851, dated November 30, 1880.

Application filed July 8, 1880. (No model.) Patented in France February 7, 1878.

To all whom it may concern:

Be it known that I, JOSEPH CLARK, of Kensington, in the county of Middlesex, Great Britain, engineer, have invented a new and useful Machine for Cutting and Removing Earth or Soil, of which the following is a specification.

The objects of my present invention are to reduce the cost of cuttings for canals, docks, railways, and other similar works, and to reduce the time required for the execution of such works by digging out a larger quantity of materials in a shorter time than hitherto. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a plan of the machine. Fig. 2 is a side elevation, and Fig. 3 an end elevation, thereof.

Similar letters refer to similar parts throughout the several views.

The machine is constructed of a strong angle-iron frame, *a*, bound together by brackets *b* at each end, and is supported by wheels *c* *c'*. The steel cutters or digging-spades *d* and sole-plates *e* are attached to a small supplementary frame, *m*, the inner end of which is hinged by a pin, *f*, to the main frame, so as to allow said cutters and sole plate to be lifted at will out of engagement with the ground. The machine is fitted with a set of cutting-gear at each end, to enable it to cut both ways without turning it round, and the set of cutters not then in use is raised, as shown in Fig. 2.

The apparatus for raising the said cutting-gear consists of a spindle, *g*, supported in brackets *g*² on the framing *a*, which spindle is connected by chains *g*³ to the frame *m* of the cutting-gear. The end of the spindle *g* is square, and is fitted with a handle or lever to turn such spindle when required. By turning the said spindle the chains *g*³ are wound upon the spindle *g*, and so raise the cutting-gear. The said spindle is fitted with a ratchet-wheel and pawl, *h*, to keep the cutting-gear up after being raised, as described. The spindle *g* is not shown in Fig. 3, being omitted to show joint *l*² of the side trough, *l*, more plainly.

The machine, when at work, is drawn by

any ordinary winding-engine, which I prefer to drive by steam; but it may be driven by wind or other motive power, as may be convenient. Two such engines are used to work the machine. They are placed some distance apart—say about four hundred yards—and are stationary when at work. They draw, by means of a wire rope, the said traveling cutting-machine backward and forward between them. The said cutters cut a slice or portion off the surface of the intervening ground in the line of its track each time the machine travels over it.

The machine is drawn by the wire rope and shackle *i*, attached to the bracket *b*, and to prevent injury to the cutters *d* through meeting with large stones or roots of trees when at work, the shackle *i* is fitted with a link, which is not welded, to enable it to pull open and thus release the wire rope when the cutters meet an obstacle in the ground which is liable to injure them.

When the earth has been cut by the cutters *d* it is forced over the sole-plate *e* and onto the endless web *k*, whereon such earth is conveyed to the upper end thereof at *k'*, and there falls over upon the side trough, *l*. It is thence conveyed to the upper end, *l'*, of the said trough, and there discharged either into wagons for its removal, or it is deposited to form an embankment, as may be required.

The endless web *k* is supported on small rollers *o*, fitted in the frame *m*. The web *k* is driven at the same speed as the machine cuts into the ground by the frame *m* and rollers *o*, resting on the under roller, *n*, which rolls along upon the ground as the machine progresses, and the web *k*, which is held tightly between the rollers *o* and *n*, is thereby caused to travel at the same speed as the machine, to convey the earth upon the said web, as previously described.

The side trough, *l*, is formed of wood or iron sides, framed together, and is jointed to the framing *a* by brackets and fulcrum-pin *l*². It is also fitted with small rollers for supporting an endless web, *w*, which rollers turn in bearings *p*, fitted to the sides of the trough *l*. The endless web *w* is fitted around the large end rollers, *r* and *r'*, for conveying the earth along

the said trough l . Side plates, x , are fitted to prevent the earth from falling off at the sides of the trough l .

5 Motion is given to the web w in the following manner: The supporting-wheels c' are fixed to the axle c^2 through their centers, so that such axle turns with them, and on this axle a chain-wheel, s , is fixed, so that when the wheels c' roll along the ground they drive such
10 chain-wheel s . A corresponding chain-wheel, s^2 , is fixed on the end of the spindle t , and an endless chain, s^3 , couples the wheels s and s^2 , so that the wheel s may drive the wheel s^2 thereby. The spindle t is fitted with bevel-
15 tooth wheels, which gear alternately with a tooth-wheel, u , on the spindle of the roller r .

It has been stated herein that the machine is drawn backward and forward when at work, and the movement of the wheels c' is consequently reversed by each motion; but by putting one of the bevel-tooth wheels on the spindle t in gear, as required, a uniform motion is given to the web w to discharge the earth placed upon such web w at its upper end, l' .
25 The elevation of the upper end of trough l'

can be altered, as required, by adjusting the pin l^3 to either hole in the rack-bracket l^4 , and in extreme cases a supplemental trough may be added to raise the said delivering end still higher than can be done by a single trough. 30
 y is a guide-rod to keep the bracket l^4 upright.

Having thus particularly described the nature and object of my said invention and the method of carrying the same into practice, I claim as novel and desire to secure by Letters Patent of the United States— 35

1. In combination with the hinged cutting devices and the mechanism for raising and holding them out of engagement with the soil, the inclined endless webs k , having upper rollers, o , and under rollers, n , substantially as set forth. 40

2. The shackle fitted with an unwelded link, in combination with the excavating-machine and the chain for dragging the same, substantially as set forth. 45

JOSEPH CLARK.

Witnesses:

WILLIAM COOKE,
WALTER THOMAS.