(No Model.) 2 Sheets—Sheet 1.

F. W. VOLLHERING & C. BERNHARDT.

EXCAVATING MACHINE.

No. 502,151. Patented July 25, 1893.

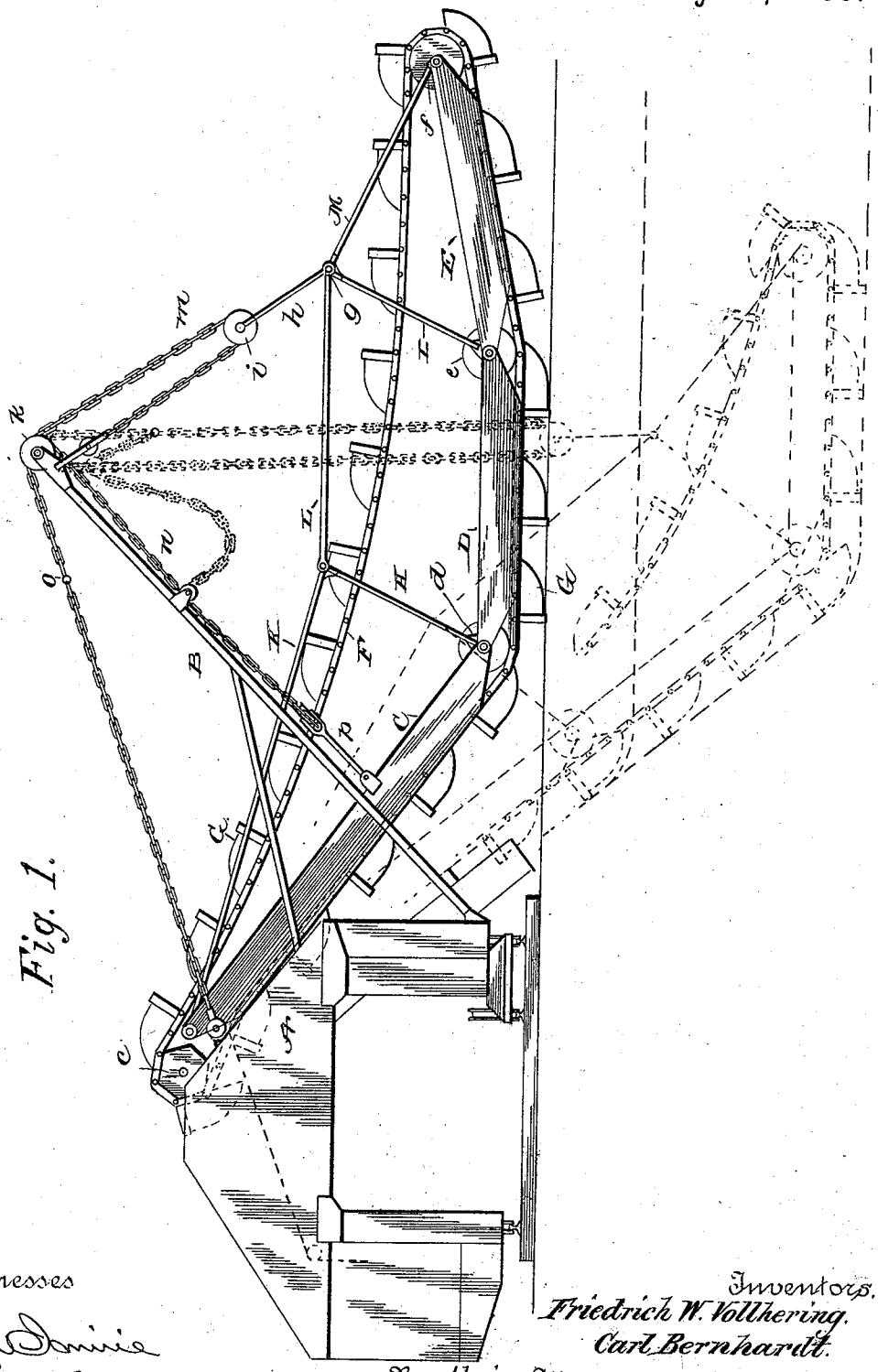

Fig. 1.

Witnesses
John Dennis
Robert Everett.

Inventors.
Friedrich W. Vollhering.
Carl Bernhardt.
By their Attorney
James L. Norris.

(No Model.)

2 Sheets—Sheet 2.

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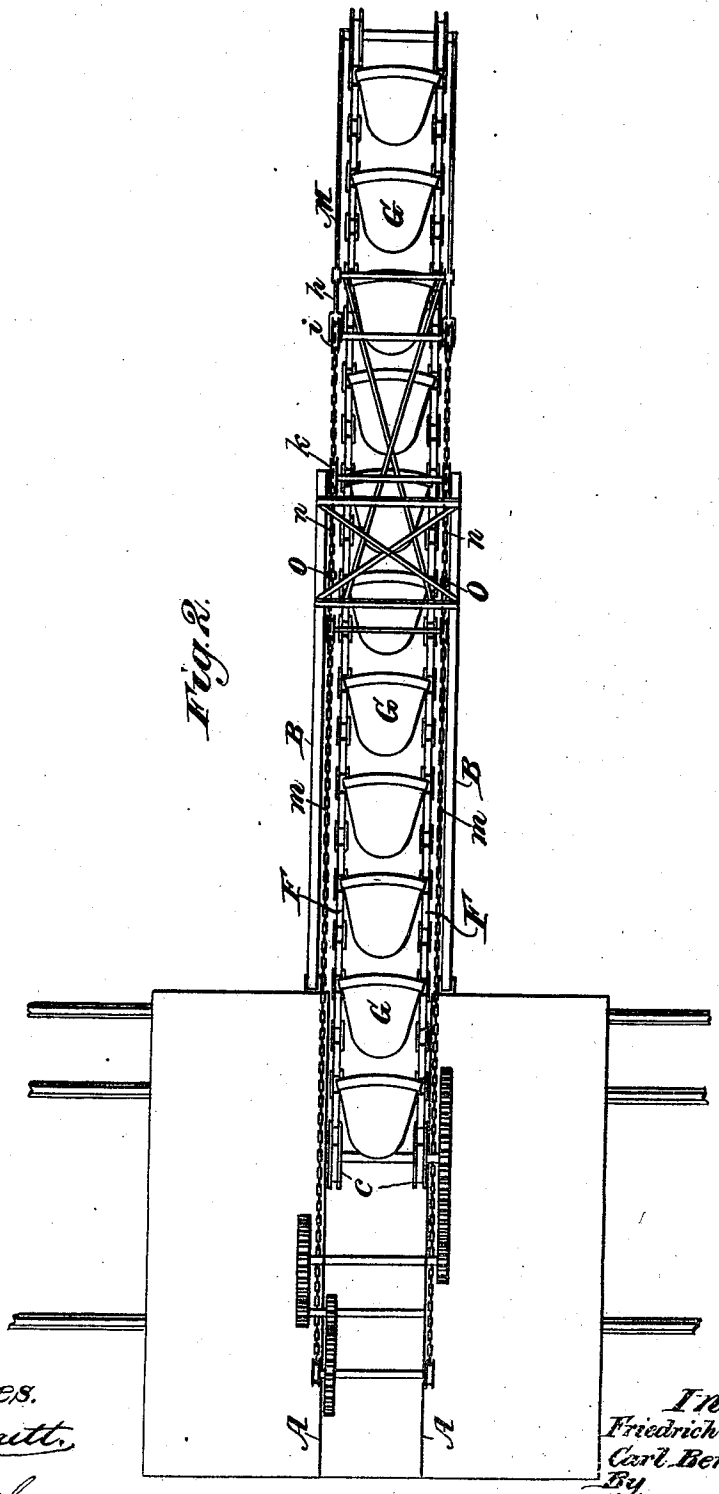

Fig. 2.

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UNITED STATES PATENT OFFICE.

FRIEDRICH WILHELM VOLLHERING AND CARL BERNHARDT, OF LUBECK, GERMANY.

EXCAVATING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 502,151, dated July 25, 1893.

Application filed April 28, 1892. Serial No. 431,038. (No model.) Patented in Germany August 30, 1891, No. 61,816; in England March 18, 1892, No. 5,407; in Canada June 14, 1892, No. 39,142, and in Austria-Hungary October 25, 1892, No. 15,547.

To all whom it may concern:

Be it known that we, FRIEDRICH WILHELM VOLLHERING and CARL BERNHARDT, subjects of the Emperor of Germany, residing at Lubeck, Germany, have invented new and useful Improvements in Excavating-Machines, (for which we have obtained Letters Patent in the Dominion of Canada, dated June 14, 1892, No. 39,142; in Austria-Hungary, dated October 25, 1892, No. 15,547, upon application filed March 22, 1892; in Germany, No. 61,816, dated August 30, 1891, and in Great Britain, No. 5,407, dated March 18, 1892,) of which the following is a specification.

Our invention relates to improvements in excavating machines and especially to that class in which an endless bucket chain is supported on a sectional frame and said invention has for its object to provide a machine of this class by which earth may be excavated in separate strata which is important where the excavated earth is to be employed in the construction of embankments or dams and for other purposes, and by which, also, the number of times the rails supporting the machine have to be shifted, is lessened.

To these ends our invention consists in the peculiar construction, combination and arrangement of parts hereinafter described and claimed, reference being made to the accompanying drawings, in which—

Figure 1 is a side elevation of a machine constructed according to our invention. Fig. 2 is a top plan view thereof.

Referring to the drawings the reference letter A represents the frame of an excavating machine, which may be of any suitable or ordinary construction. Extending from said frame are crane arms B, which support the endless chains and buckets in the manner hereinafter described. The bucket chain frame is made in three sections C, D, E, which are hinged together so that they can be arranged in a straight line, or at different angles, the section C being hinged or pivoted to the machine frame A. On each side of the bucket chain frame at the points where the sections C, D, E are hinged together, are located sprocket wheels or pulleys *d* and *e* and similar sprocket wheels or pulleys *f* are arranged at the outer end of the section E. At the inner end of the section C and at each side thereof are chain driving drums *c*, driven from any suitable motor. Trained over the pulleys *d*, *e*, and *f*, and the driving drums are bucket chains F which are allowed to hang loose in the space between the pulleys *f* and the driving drums *c*, above the pulleys *d* and *e*; thus by its weight and the weight of the attached buckets it is kept in operative relation with the under or operating sides of said pulleys or drums.

The sections of the bucket frame are strengthened and supported by hinged braces H and I, arranged at opposite sides of the bucket frame. Said braces are connected pivotally at their outer ends by longitudinal braces K, L, M and at their inner ends are pivoted to the inner ends of the sections C and E. Each set of braces H, I, forms a movable parallelogram which changes its position as the frame sections are elevated or depressed. To the joint *g* of each system of bracing a rod *h* is pivotally connected at its lower end. Each of said rods carries at its upper or forked end a sheave or pulley *i* over which pass the elevating and lowering chains *m* one end of each of said chains being connected to the end of a two-armed pendent extension *l*, of which there are two, pivoted to the crane arms B at each side of the bucket frame, and the other ends of which are passed to the frame A, after being trained over pulleys K at the extremity of the crane arms B. The hoisting frame upon which these chains are to be wound and unwound is not shown.

The reference letter *n* represents other chains which serve to support the section C. These chains are arranged on each side of the bucket frame and are connected at one end with the section C by means of rods *p*, pivoted at their lower ends to the section C and at their upper ends carrying disks between which the chains *n* are secured. The other ends of said chains *n* are connected to the chains *m* at the points *o*, after passing between the arms of the extensions *l* and over the pulleys *k*.

It will be readily understood by those skilled in the art that with this machine a much

greater area in length or width on a level can be manipulated from a stationary point, also that it will excavate much deeper than any machine now in use. Furthermore embankments, dams, &c., can be made in a much straighter line, and different strata or layers of earth can be excavated on perfectly straight planes and the earth will not be mixed, but remain separated, which is very important at certain times; and finally a machine can be manipulated to much greater advantage and at much less expense, when constructed in accordance with our invention.

Having thus described our invention, what we claim is—

1. In an excavating machine, a frame for the bucket chain constructed in sections hinged together, and pivoted bracing connected with said sections, substantially as described.

2. In an excavating machine, a frame for the bucket chain made in sections hinged together, and pivoted bracing connected with said sections, said sections and bracing arranged in such manner that they can be formed into desired angles against each other, substantially as described.

In testimony whereof we have hereunto set our hands and affixed our seals in presence of two subscribing witnesses.

FRIEDRICH WILHELM VOLLHERING. [L. S.]
CARL BERNHARDT. [L. S.]

Witnesses:
JOACHIM DÜHR,
HERMANN KAEFERSTEIN.