

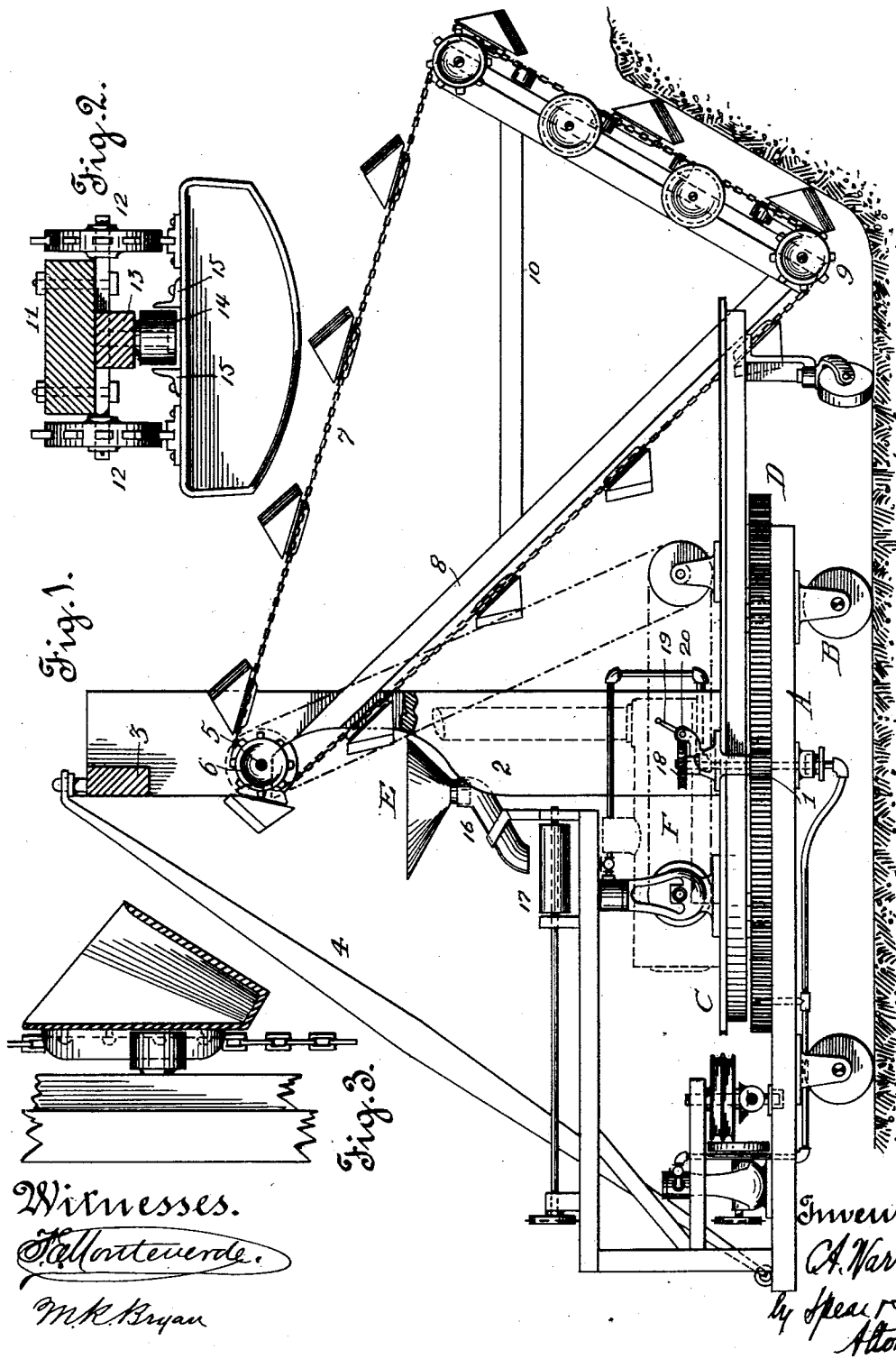
(No Model.)

2 Sheets—Sheet 1.

C. A. WARREN.
EXCAVATING MACHINE.

No. 541,193.

Patented June 18, 1895.



Witnesses.
Stallenteuerde.
M. K. Bryan

Inventor.
C. A. Warren.
by Spear, Leeds, Attorneys

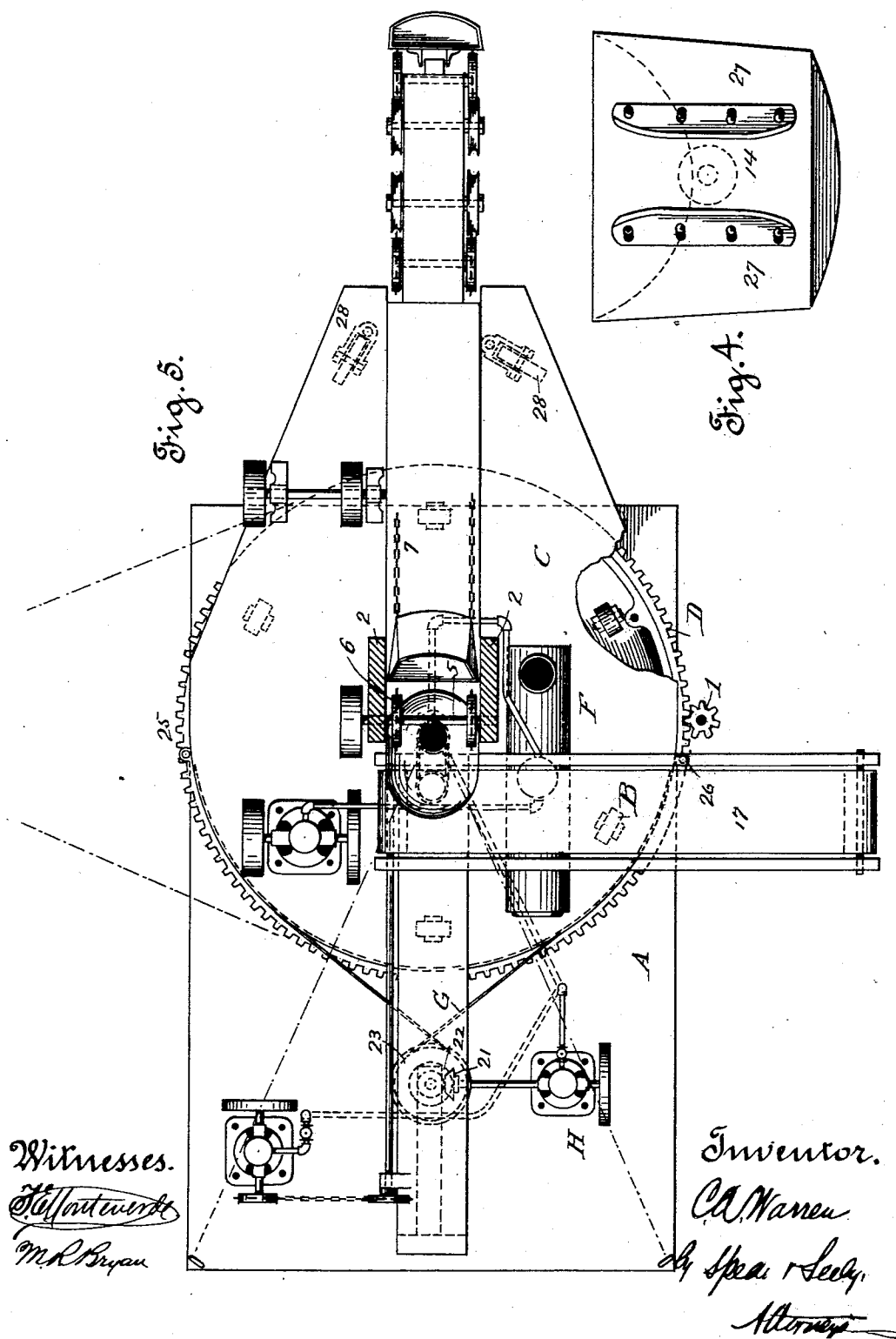
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UNITED STATES PATENT OFFICE.

CHARLES A. WARREN, OF SAN FRANCISCO, CALIFORNIA.

EXCAVATING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 541,193, dated June 18, 1895.

Application filed August 29, 1893. Serial No. 484,274. (No model.)

To all whom it may concern:

Be it known that I, CHARLES A. WARREN, a citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented certain new and useful Improvements in Excavating-Machines; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention relates to improvements in machines for cutting ditches, or for grading, or for taking down banks of sand; and the object of my invention is to provide a machine which will excavate continuously by means of a chain of buckets and which at the same time will have a movement laterally in the arc of a circle so as to make a continuous cut from side to side.

My invention is fully hereinafter described in detail and shown in the drawings, in which—

Figure 1 is a side elevation. Fig. 2 is a cross-section of one of the buckets. Fig. 3 is an elevation and partial section of one of the buckets. Fig. 4 is a plan view of a single bucket. Fig. 5 is a plan view of the entire machine.

The machine shown in the drawings is supposed to be engaged in cutting down a bank for the purpose of grading.

A, represents a platform mounted upon carrying wheels or casters B, which may run upon the ground, or if preferred upon a track laid toward the bank to be cut down.

C, represents a turntable provided with a circular spur gear D, mounted in the main platform and designed to rotate thereon. Motion is communicated to the turntable and its gear by means of the pinion 1. Upon the turntable are secured uprights 2 2 having a cross-brace 3, and one or more rearwardly projecting braces 4. These uprights are shown in section in Fig. 5, and in elevation partly broken away in Fig. 1. Journaled in them on a transverse shaft 5, are sprocket wheels 6 6, over which pass chains 7 to which the buckets which excavate the earth are attached. These chains pass along an oblique frame 8 and sprocket pulleys 9, thence up at substantially the angle of the bank and then directly to the main sprocket wheel previously described. By this construction I

carry the buckets positively up the face of the bank; but I can change the angle of the cutting buckets by lengthening the bracing timbers 10, and adding new links to the chains which support the buckets, which will change the angle of the cutting portion.

I have shown in Fig. 2, a cross-section which shows how the buckets are kept in line while they are cutting. The timber 11, to which is bolted the shafts 12, for the guiding sprockets of the pulleys, is provided with blocks 13, in which are journaled rollers 14 as shown. The upper surface of the buckets is provided with guides 15 which, as shown in Fig. 2, bear upon rollers and thus prevent the buckets from getting out of line. I prefer to provide what I term the bottom of the bucket with adjustable guides 27 (best shown in Fig. 4, but also in Fig. 1), which prevent the bucket from moving sidewise, provided that the proper tension is put upon the chains which carry the buckets. This chain of buckets discharges its contents into a hopper E, which is placed as nearly as possible centrally above the turntable and is supported upon some fixed part of the main frame as shown in Fig. 1. The hopper discharges the spoil through a spout 16, upon a carrier or draper 17, which runs transversely across the machine and conveys it to any suitable receptacle such as a car or a wagon brought beneath its end, or upon the ground so as to form a bank.

I now describe the means by which the turntable is operated so as to swing or oscillate the bucket frame from side to side while in the act of cutting and filling. I have shown a boiler F, upon the turntable which generates steam for any engine or all engines that may be required in the operation of the whole apparatus. For convenience I have described it in connection with separate engines, although a single engine with a proper system of shafting may be employed.

The turntable is intended to swing upon its center so as to carry the buckets transversely across the line of the cut to be made and the buckets will therefore make an arc-shaped cut. In order to make the complete swing which is the practical limit of the movement of the buckets, the movement is from the dotted lines shown in Fig. 5, to a position opposite those lines which is as far as it will

ever need to go. I have shown in the drawings two ways of moving the turntable to accomplish this swing. One is by means of a skew-gear 18, acted upon by a lever 19, and gear 20, supposed to be operated by hand. The other is by means of an engine H, the shaft of which through beveled gearing 21, 22, drives pulleys 23, 24, from which a cable G extends and is secured at points 25, 26, upon opposite sides of the turntable as shown.

The turntable projects forward as shown and its front end upon which the frame for the buckets is carried, is supported by caster wheels 28 which travel upon the ground and thus aid in keeping the bucket frame rigid. At the same time these wheels will follow the turntable in its rotary movement, being self adjusting so as to take the proper line or direction.

Having thus described my invention, what I claim is—

1. In an excavating machine, a chain of

buckets having a triangular line of movement so as to cut upward along the face of a bank, in combination with a frame, and guides on said frame and said buckets for holding the chain rigidly in line with said frame while cutting, substantially as described.

2. In an excavator, a dredge bucket having guides secured to one of its surfaces in combination with a frame, and with rollers journaled in said frame, substantially as set forth.

3. A bucket for dredgers carried by endless chains and having secured to it ribs or guides such as 27, substantially as described and shown.

In testimony whereof I have affixed my signature, in presence of two witnesses, this 18th day of August, 1893.

CHARLES A. WARREN.

Witnesses:

L. W. SEELY,
JOHN COFFEE.