(No Model.) 2 Sheets—Sheet 1.

H. COMMANDOER.

WAVE POWER.

No. 456,266. Patented July 21, 1891.

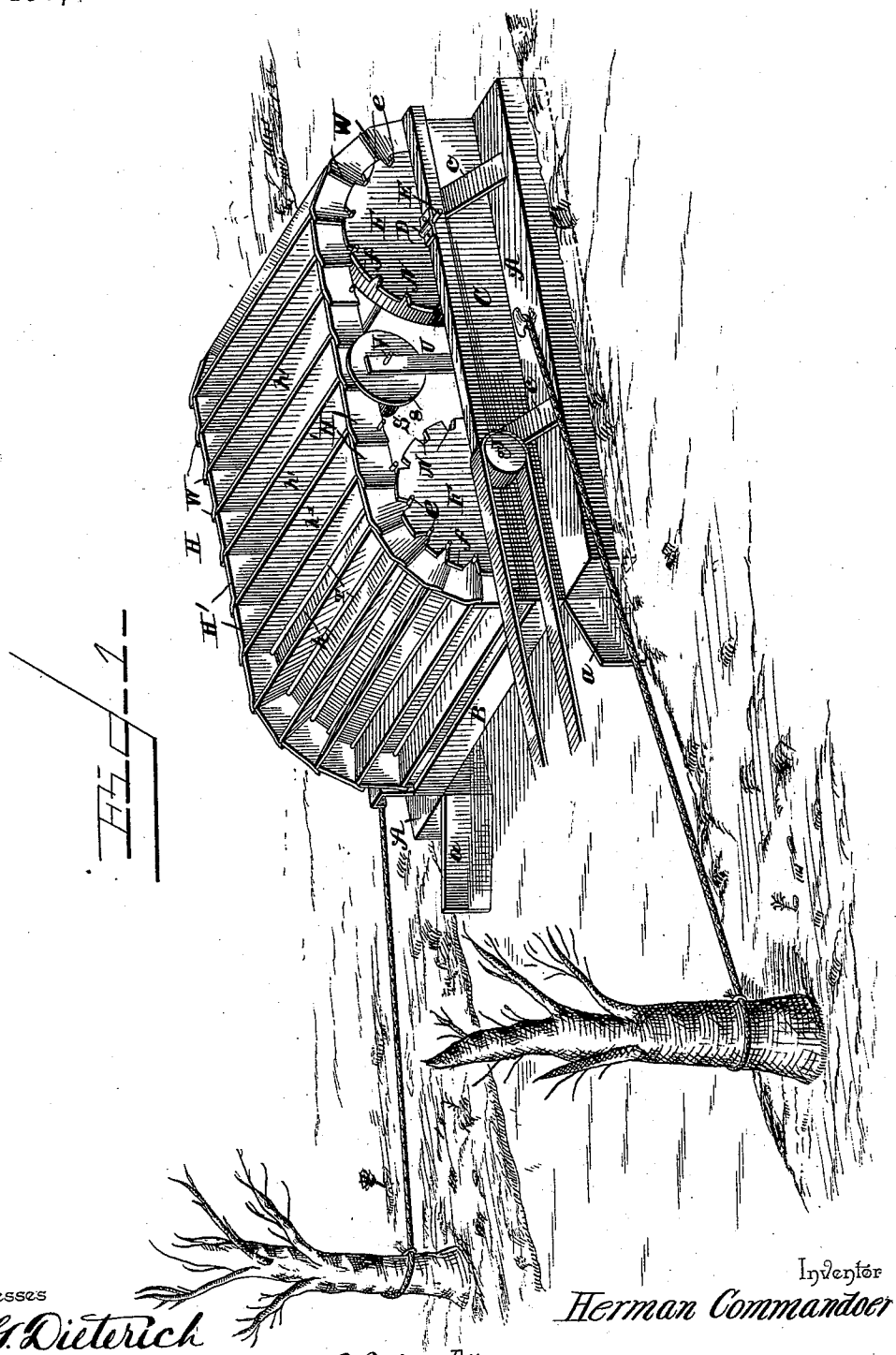


Fig. 1.

Witnesses
H. G. Dieterich

Inventor
Herman Commandoer

By his Attorneys,
N. L. Collamer. C. A. Snow & Co.

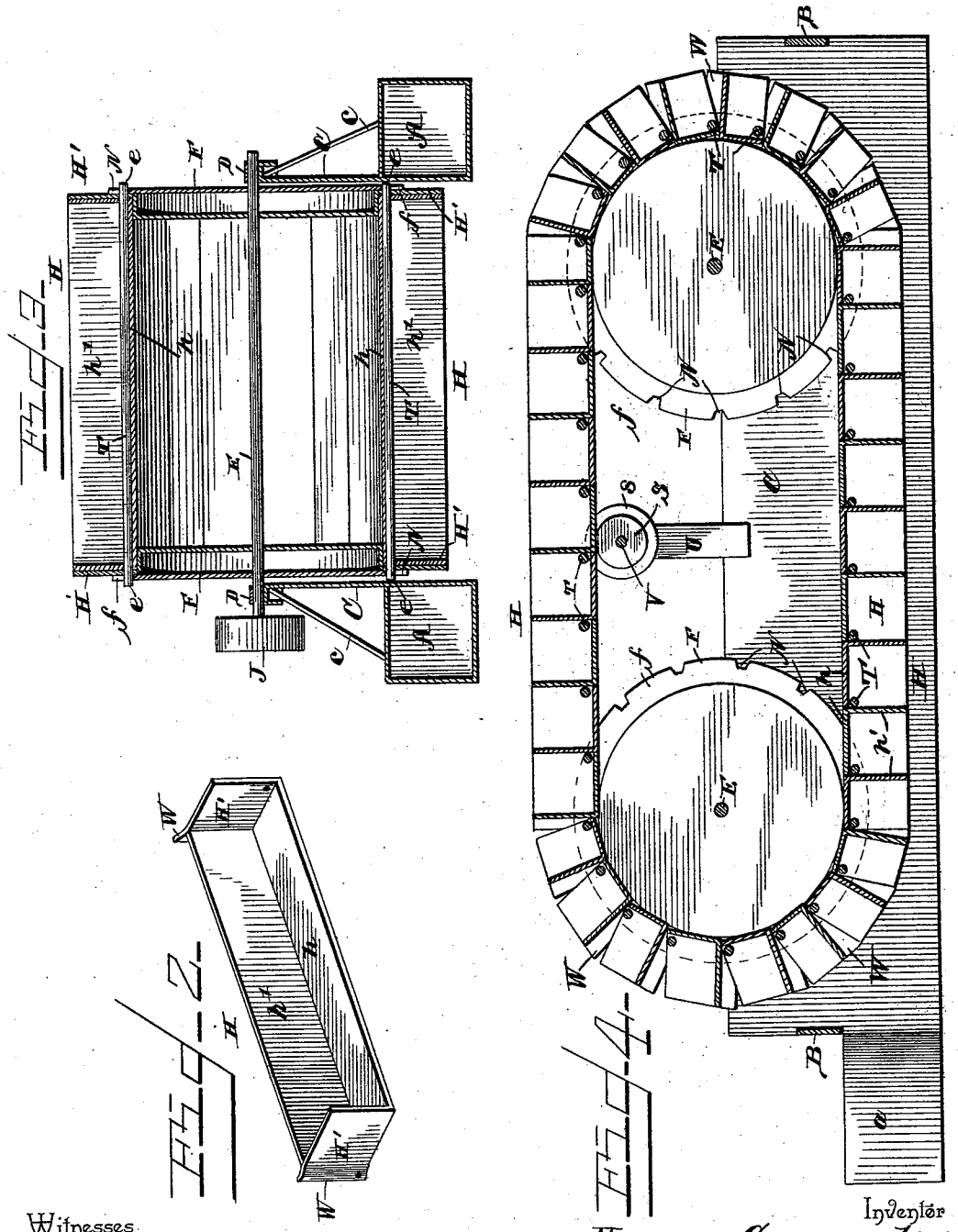
THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 2 Sheets—Sheet 2.

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UNITED STATES PATENT OFFICE.

HERMAN COMMANDOER, OF MILWAUKEE, WISCONSIN.

WAVE-POWER.

SPECIFICATION forming part of Letters Patent No. 456,266, dated July 21, 1891.

Application filed January 15, 1891. Serial No. 377,883. (No model.)

To all whom it may concern:

Be it known that I, HERMAN COMMANDOER, a citizen of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented a new and useful Wave-Power, of which the following is a specification.

This invention relates to hydraulic motors adapted more especially for use in streams having a certain current, in small water-falls, in rapids, or in artificial chutes; and the object of the same is to effect certain improvements upon a device of similar nature for which Letters Patent No. 440,397 were granted to me November 11, 1890.

To this end the invention consists of the specific details of improvement hereinafter more fully described and claimed, and as illustrated on the two sheets of drawings, wherein—

Figure 1 is a perspective view showing this improved device floating in a stream, moored to trees upon the bank, and having its driving-pulley connected by a belt with machinery. (Not shown.) Fig. 2 is a perspective detail of one of the buckets. Fig. 3 is a vertical cross-section of the machine, taken through the center of the driving-pulley. Fig. 4 is a central longitudinal section.

Referring to the said drawings, the letter A represents parallel floats united by end beams B, which are arranged above the top of the floats and connect side walls C, which rise some distance from the inner edges of the floats and are braced by diagonal braces *c*. At the front end of the floats—that is to say, that end which is upstream or opposed to the current—are arranged divergent wings *a*, which gather and direct the water through the space between the floats. Although I have not illustrated it, it will be obvious that these wings may be omitted if the stream be too narrow or may be lengthened if the stream be broad or the current gentle, and by a slight change in the construction of parts the device is adapted for use under falls, rapids, or at the mouth of artificial chutes, the passage-way between the floats being in that instance preferably closed across the bottom, all as will be clearly understood by a hydraulic engineer, and hence not necessary of more elaborate illustration and description in this connection.

Upon the upper edge of each side wall and near each end thereof is a bearing D of any suitable construction, and journaled in said bearings across each end of the device is a transverse shaft E, one of which carries upon its outer extremity a driving-pulley J, from which a belt may be led to the machinery which is to be driven by this device. Upon each of said shafts and near each end thereof just inside the bearing D is keyed a large wheel F, which wheels are constructed as best seen in Fig. 3, and have flanges *f* projecting from their outer edges and provided with notches N, arranged at regular intervals.

The letter H designates buckets, Fig. 2, and each bucket comprises a bottom *h*, a back *h'*, rectangular end pieces H', connected along two edges to the ends of the bottom and back, and wings W, extending rearwardly from the end pieces slightly beyond the back *h'* and projecting slightly outward. The buckets when arranged for use in the device are so placed that the front edge of the end pieces H' of one bucket will come just inside the wings W of the bucket next in front, and passing transversely across each bucket is a shaft T, each of whose ends extends through the lower front corner of an end piece H' and through the lower portion of the wing W outside the same, its extremity *e* extending outwardly for a sufficient distance to engage one of the notches N above mentioned.

Several of the above-described buckets are connected in the manner set forth, so as to form an endless chain, and this chain passes at each end of the device over a pair of the large wheels F, where the ends of the bottoms *h* of the buckets bear upon the peripheries of the wheels. The flanges *f* prevent the longitudinal displacement of the buckets, and the extremities *e* of the shafts T rest in the notches N. Between these large wheels the lower side of this endless chain passes longitudinally between the floats A and sinks sufficiently below the water-level to receive the water which is flowing between the floats, and the upper side of said endless chain passes over a pair of supporting-wheels S, (which may also be provided with flanges *s*,) mounted on a shaft V, journaled at its ends in uprights U, rising from the centers of the side walls C.

The function of these supporting-wheels is to keep the upper side of the endless belt from sagging.

In operation, the device having been placed in a stream, as shown, or in suitable position to receive the water in the proper direction, a band or belt is connected to the pulley J and the operation commences. The advantages in the details of construction above described over the machine heretofore patented to me are as follows: The wings *a* serve to direct the water between the floats without impeding the force of the current. The side pieces C serve to confine between the floats what water may splash up above the buckets and would otherwise run over the floats and become unavailable for further use. The notched flanges on the large wheels F, engaged by the extremities *e* of the shafts T, cause said large wheels and their shafts E to be positively rotated by the movement of the endless chain of buckets. The supporting-wheels S prevent the sagging of the upper side of said chain, and the specific construction and arrangement of the buckets adapts them to receive every available pound of water which passes between the floats, whereby the greatest amount of power possible is secured from a current of given force.

What is claimed as new is—

In a hydraulic motor, the combination, with two shafts carrying supporting-wheels, of a series of buckets connected so as to form an endless chain extending around said wheels, each bucket comprising a bottom, a back, rectangular ends connected to said bottom and back and normally resting against the back of the bucket next in front, rearwardly-extending and outwardly-diverging wings continuing the ends to the rear of said back, and a transverse shaft extending across the bottom inside the bucket through the ends near their lower front corners and through the lower ends of the wings of the bucket next in front, as and for the purpose set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

HERMAN COMMANDOER.

Witnesses:
HENRY C. RUNKEL,
THOS. SHANNON.