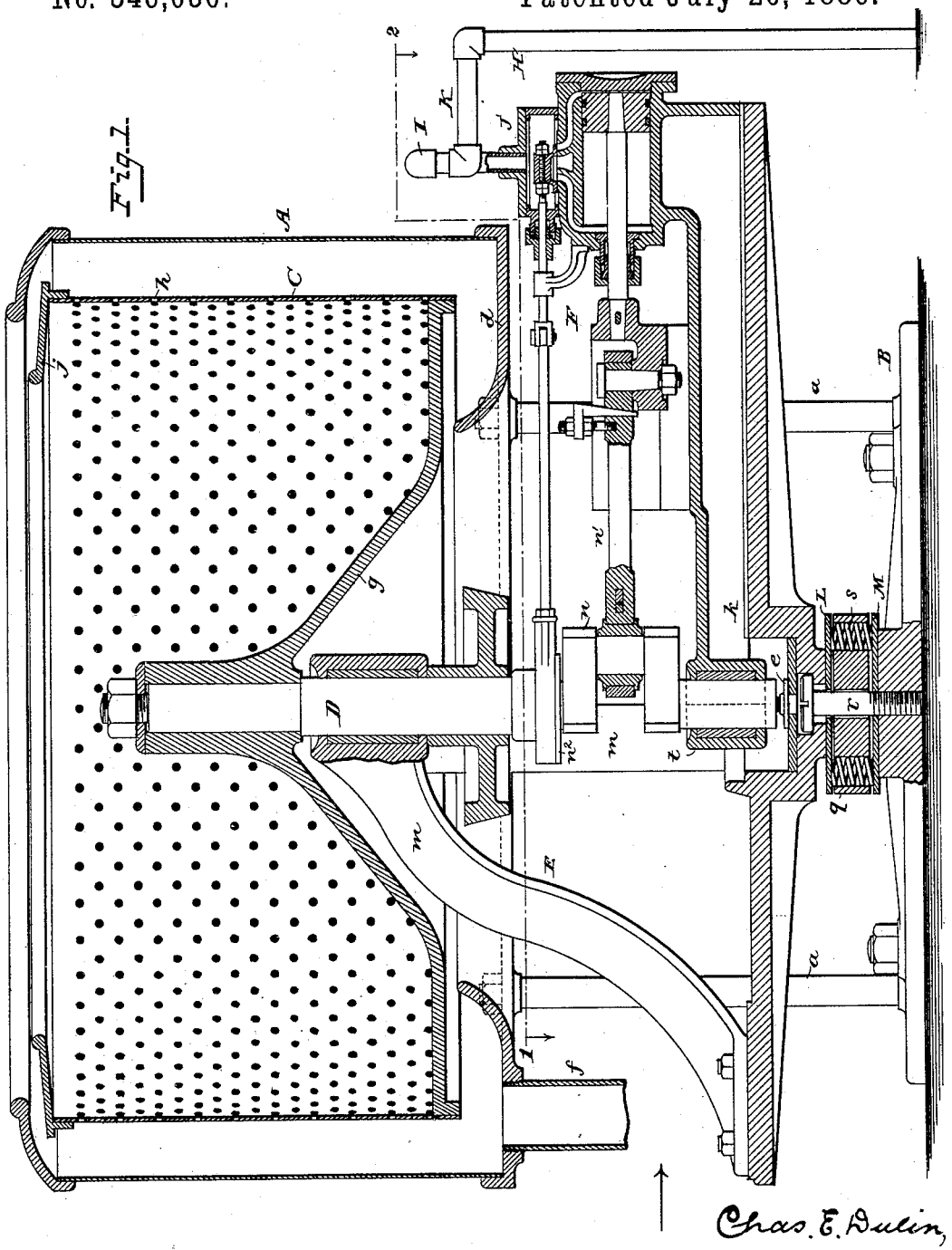
(No Model.) 3 Sheets—Sheet 1.

C. E. DULIN.

CENTRIFUGAL HYDRO-EXTRACTOR.

No. 346,030. Patented July 20, 1886.

Fig. 1.



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Court. a Cooper,
A. C. Fansmann.

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Fig. 2.

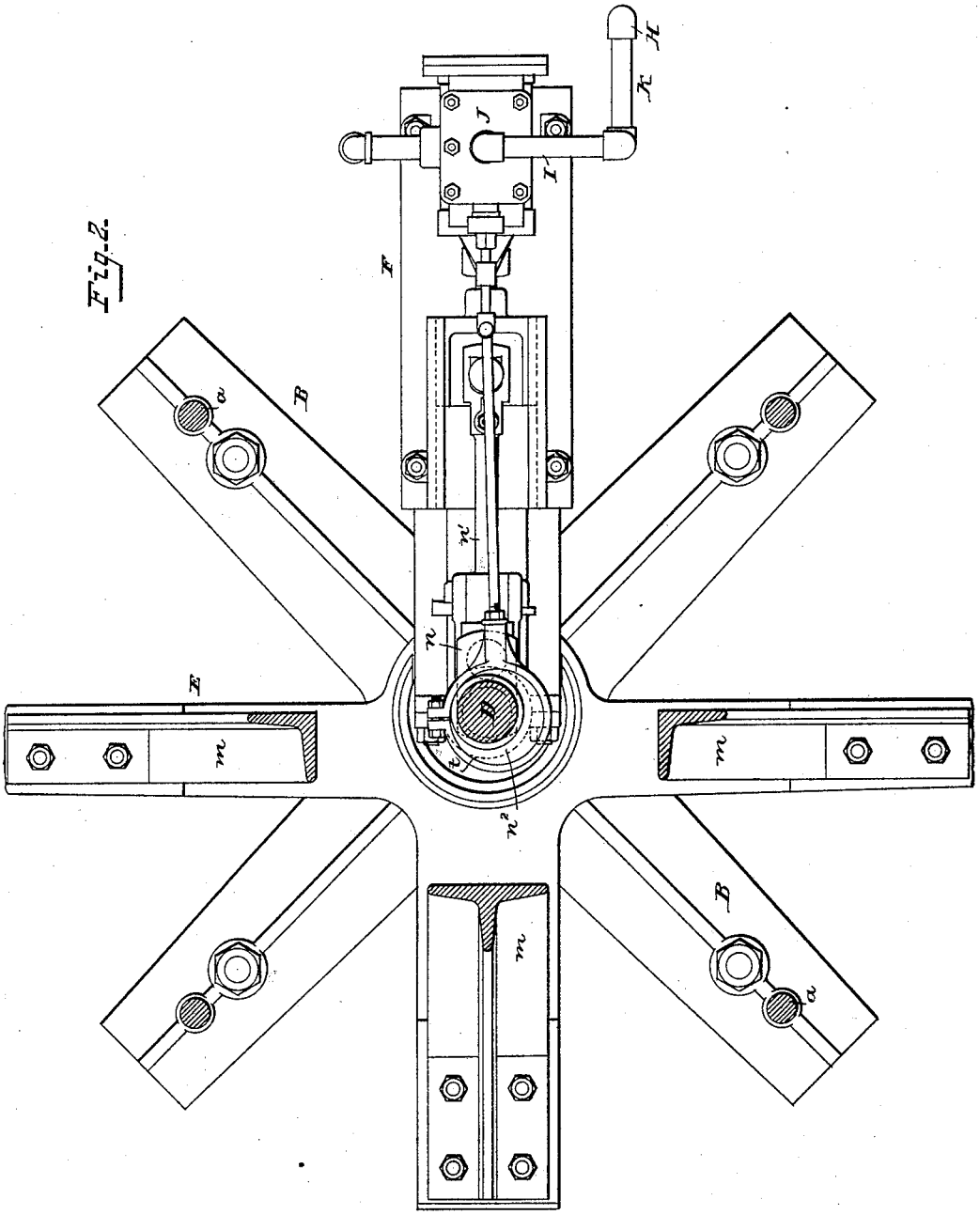

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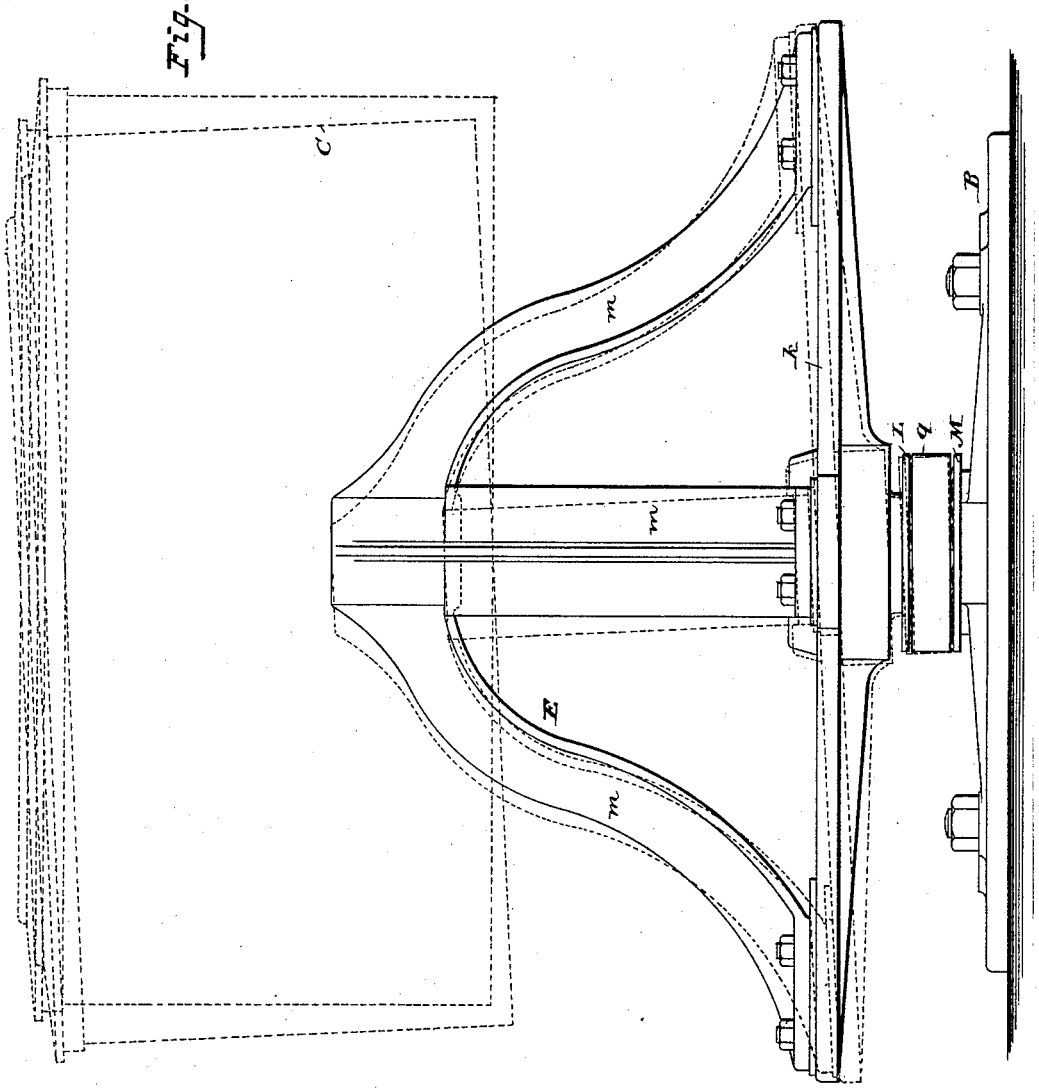
Fig. 3.



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UNITED STATES PATENT OFFICE.

CHARLES E. DULIN, OF PHILADELPHIA, PENNSYLVANIA.

CENTRIFUGAL HYDRO-EXTRACTOR.

SPECIFICATION forming part of Letters Patent No. 346,030, dated July 20, 1886.

Application filed December 8, 1885. Serial No. 185,200. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. DULIN, a citizen of the United States, and a resident of the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Centrifugal Hydro-Extractors, of which the following is a specification.

In centrifugal machines as ordinarily constructed and used the unequal loading of the basket or the shifting of the load tends to shift the position of the axis of rotation, and to cause lateral strains upon the shaft-bearings, which speedily wear the latter and otherwise rack and deteriorate the apparatus. Attempts have been made to overcome this difficulty by so supporting the shaft and constructing its bearings as to permit a slight oscillation or gyration of the shaft, which thereby absorbs the shocks; but this arrangement is attended with constant changes in the relative positions of the basket-shaft and the driving-shaft, so that the driving-belt is alternately tightened and loosened, causing the rapid wearing and deterioration of the belt or its displacement and breaking. I overcome these difficulties by providing the basket-shaft with fixed bearings relatively immovable, and mounting the bearings upon a rocking frame, which supports the driver or motor, whereby rotation is imparted to the shaft, so as to permit the axis of rotation to change from time to time without altering the relative position of the shaft and its motor.

In carrying my invention into operation I use rocking frames differently constructed and mounted according to the purpose for which the apparatus is used, its construction, and the character of the motor, and I use such motor as may be most advantageous, and connect it with the shaft in the most effective manner, these details varying according to circumstances, and the particular constructions not being essential to the effective embodiment of my invention.

In the accompanying drawings, forming part of this specification, I have shown a centrifugal apparatus in which a steam-engine constitutes the motor, Figure 1 being a longitudinal sectional elevation of the apparatus; Fig. 2, a sectional plan on the line 1 2, Fig. 1; Fig. 3, an end view of the rocking frame and its support, looking in the direction of the arrow, Fig. 1.

The apparatus consists, essentially, of the usual curb or casing, A, supported by pillars *a*, resting on the foundation or bed plate B, the usual perforated basket, C, carried by a shaft, D, a frame, E, supporting the shaft D, and supported upon a rocking bearing, and an engine, F, supported upon the frame E, and connected to rotate the shaft D.

The curb A is open at the top, and is provided with the usual annular flanged or dished bottom, *d*, constituting a trough or receptacle for the matter discharged from the rotating basket, a discharge-pipe conducting such matter to any suitable receptacle.

The basket C has a conical bottom, *g*, supporting the perforated thin-metal casing *h*, stiffened at the upper side by a heavy metal rim, *j*.

The frame E consists of a bed-plate, K, and converging overhanging arms *m m m*, and in the bed-plate is a recess containing a step, *e*, for the shaft, and the arms *m m* and a projection, *t*, of the bed-plate carry bearings, through which the shaft extends.

When an electric motor is used, the armature is mounted directly on the shaft D, the field-magnets being supported by the bed-plate *k*, and when a water-motor is used the blades may be secured to the shaft, the shell surrounding the shaft and supported by the bed-plate; but in the construction shown, where a steam-engine is the motor, the shaft has preferably a crank, *n*, to which the connecting-rod *n'* of the engine is connected, the valve of the engine being operated from an eccentric, n^2, on the shaft D.

As the frame E oscillates, the connection between the valve-chest J and steam-pipe H must be flexible or jointed. I have shown a jointed connection consisting of two pipes, I K, jointed to each other and to the valve-chest and to the steam-pipe, so as to allow the engine to swing in any direction independently of the pipe H.

The rocking bearing or support for the frame E, as shown, consists of a series of springs, *s*, of rubber, metal, or other material, placed between a flat plate or bearing-face, L, on the frame,

and a similar plate or face, M, on the base-plate. The springs, as shown, are spiral springs, arranged in a circle in openings *q* in a central block, *p*, and a bolt, *r*, extending loosely through openings in the bed-plate *k*, plates L M, and block *p* into the foundation, and holds the parts together without interfering with the oscillation of the frame E upon its spring-bearings.

The cage is loaded, as usual, and steam being admitted to the engine puts the cage in rapid rotation within the stationary cope. So long as the cage is evenly loaded and meets with no obstruction, it will rotate with its axis central with that of the cope; but should the shifting of the load or any other cause tend to shift the axis of rotation, tilting the cage to either side, as shown in dotted lines, Fig. 3, the entire supporting-frame, with the shaft and motor-engine, will vibrate so as to permit the change of position without shock or strains, and, as the shifting of the relative positions of the basket-shaft and motor are thus always preserved, no injury can result, nor can the apparatus be in any way injuriously affected by the movements which have hitherto proved so detrimental to all centrifugal apparatus.

While I have shown and described a spring-bearing for the frame E, it may rock in a ball-and-socket bearing, or be mounted upon gimbals.

Without limiting myself to the precise construction and arrangement of parts shown, I claim—

1. A centrifugal machine provided with a rocking frame supporting the basket-shaft, and a motor-engine supported by said frame and connected with the shaft, substantially as described.

2. The combination, in a centrifugal machine, of a fixed curb, and a frame supported upon rocking bearings and carrying a shaft, basket connected to the shaft, and engine connected with the shaft in fixed relation thereto, substantially as described.

3. The combination of the curb supported in a fixed position, a frame supported on a rocking bearing below the curb, a shaft rotating in fixed bearings on the frame, and an engine connected to the shaft and secured to the frame, substantially as described.

4. The rocking frame having bearings for a shaft carrying a basket, and an engine supported by the frame, and having flexible connections with a supply-pipe, and connected to drive the shaft, substantially as described.

5. The combination of the frame E, having a bed-plate and overhanging arms, a crank-shaft turning in bearings of the frame, and an engine supported by the bed-plate and connected to the crank, and a rocking bearing for the frame, substantially as described.

6. The combination of the frame supporting the basket-shaft and driving-engine, and a bearing consisting of springs arranged below a bearing plate or face of the frame, to permit the latter to be tilted in any direction, substantially as described.

7. The combination of the bed B, frame supporting the basket-shaft and engine, plates L M, springs *s*, and bolt *r*, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CHAS. E. DULIN.

Witnesses:
GEORGE F. EISENHARDT,
WM. H. DOERING.