(No Model.) 2 Sheets—Sheet 1.

L. W. BATES.

CUTTER FOR DREDGERS, EXCAVATORS, &c.

No. 526,514. Patented Sept. 25, 1894.

Fig. 1.

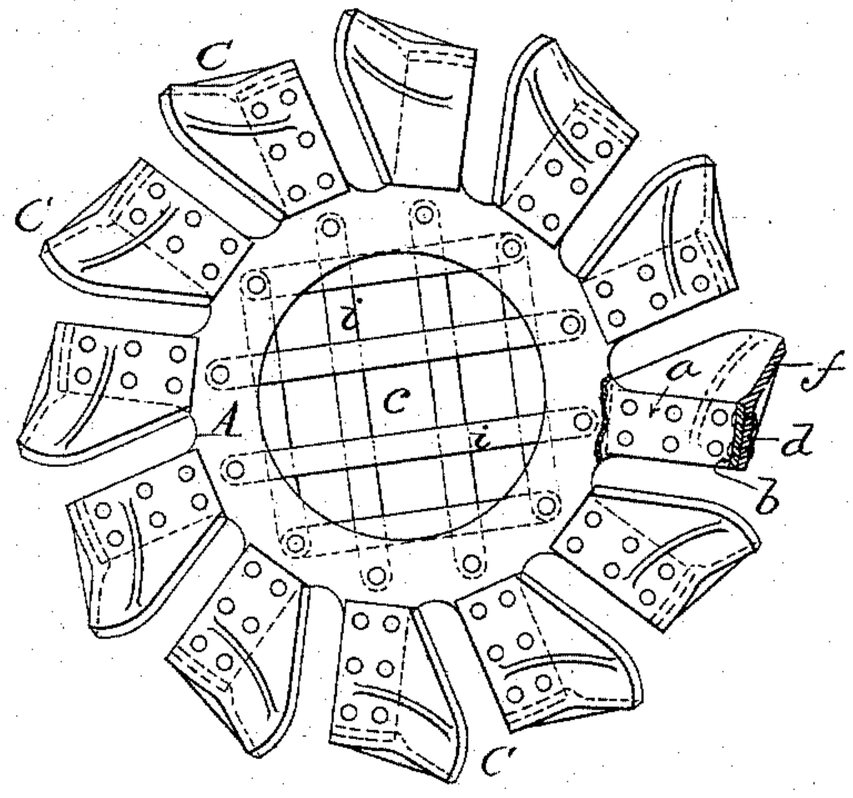


Fig. 2.

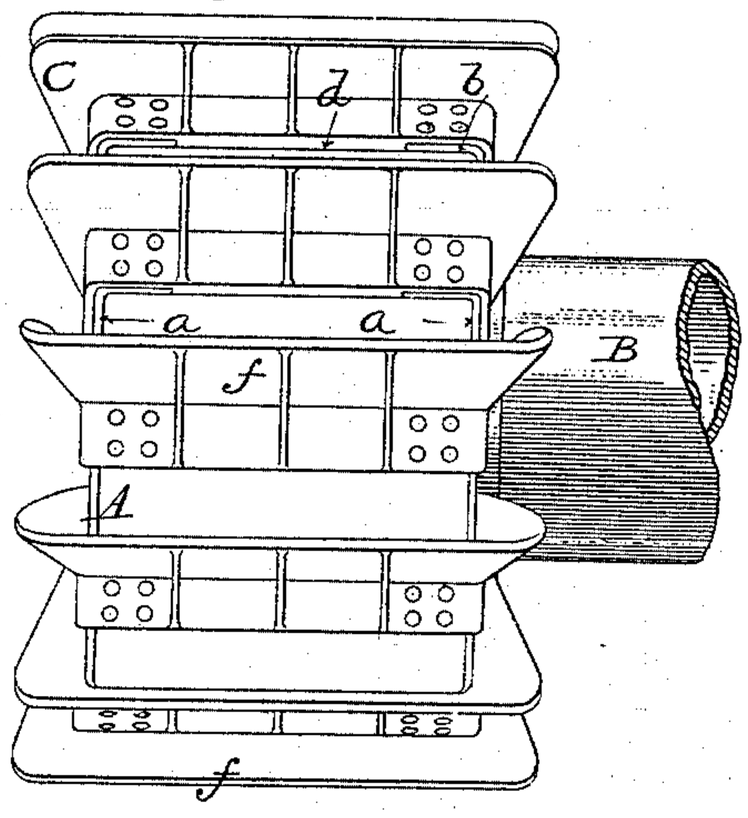
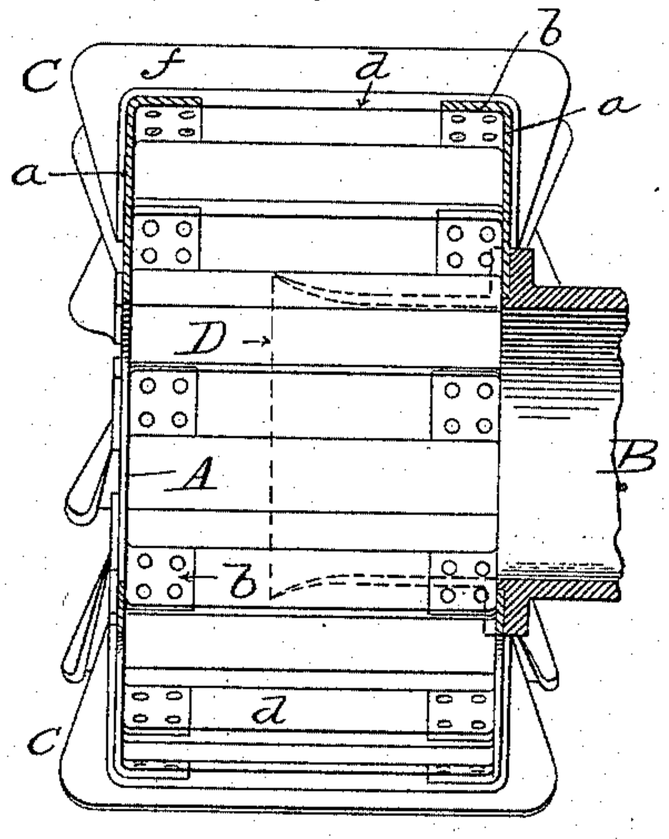


Fig. 3.

Fig. 4.



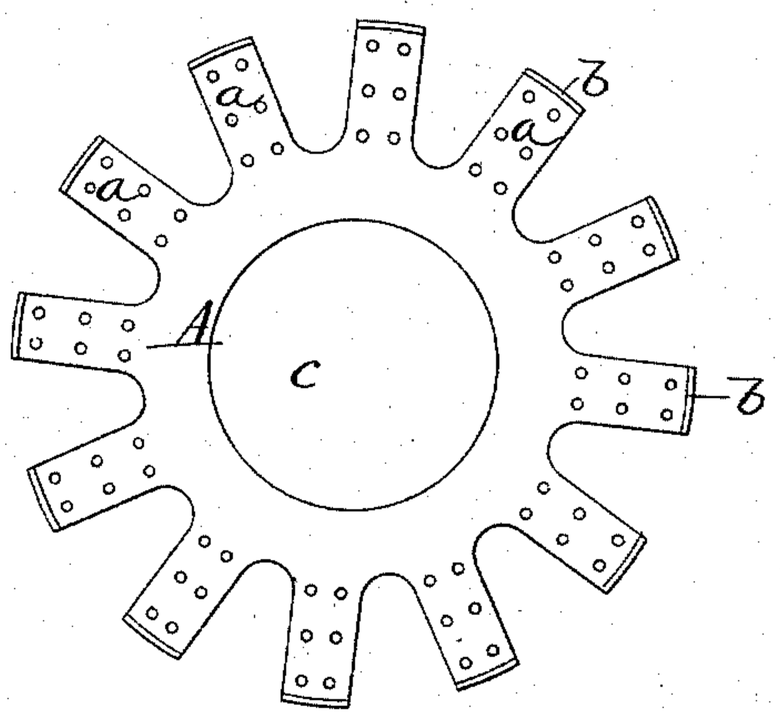


Fig. 5.

Fig. 6

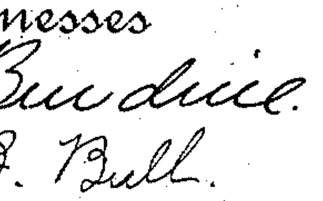


Fig. 7.

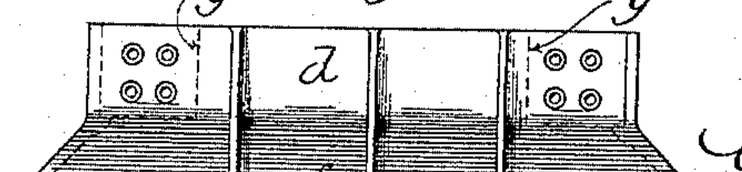


Fig. 8.

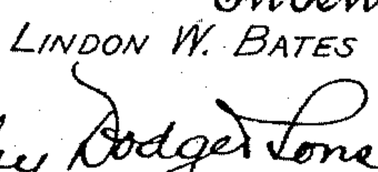


Fig. 9.

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(No Model.) 2 Sheets—Sheet 2.

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No. 526,514. Patented Sept. 25, 1894.

Fig. 10.

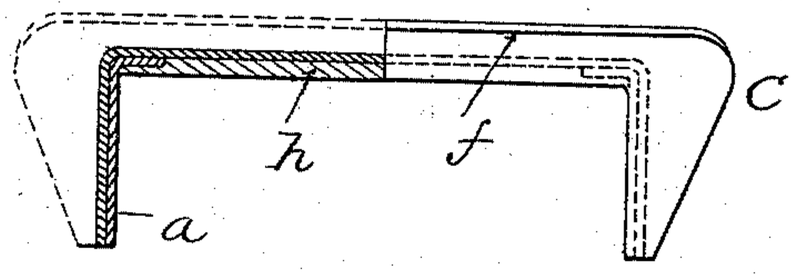


Fig. 11.

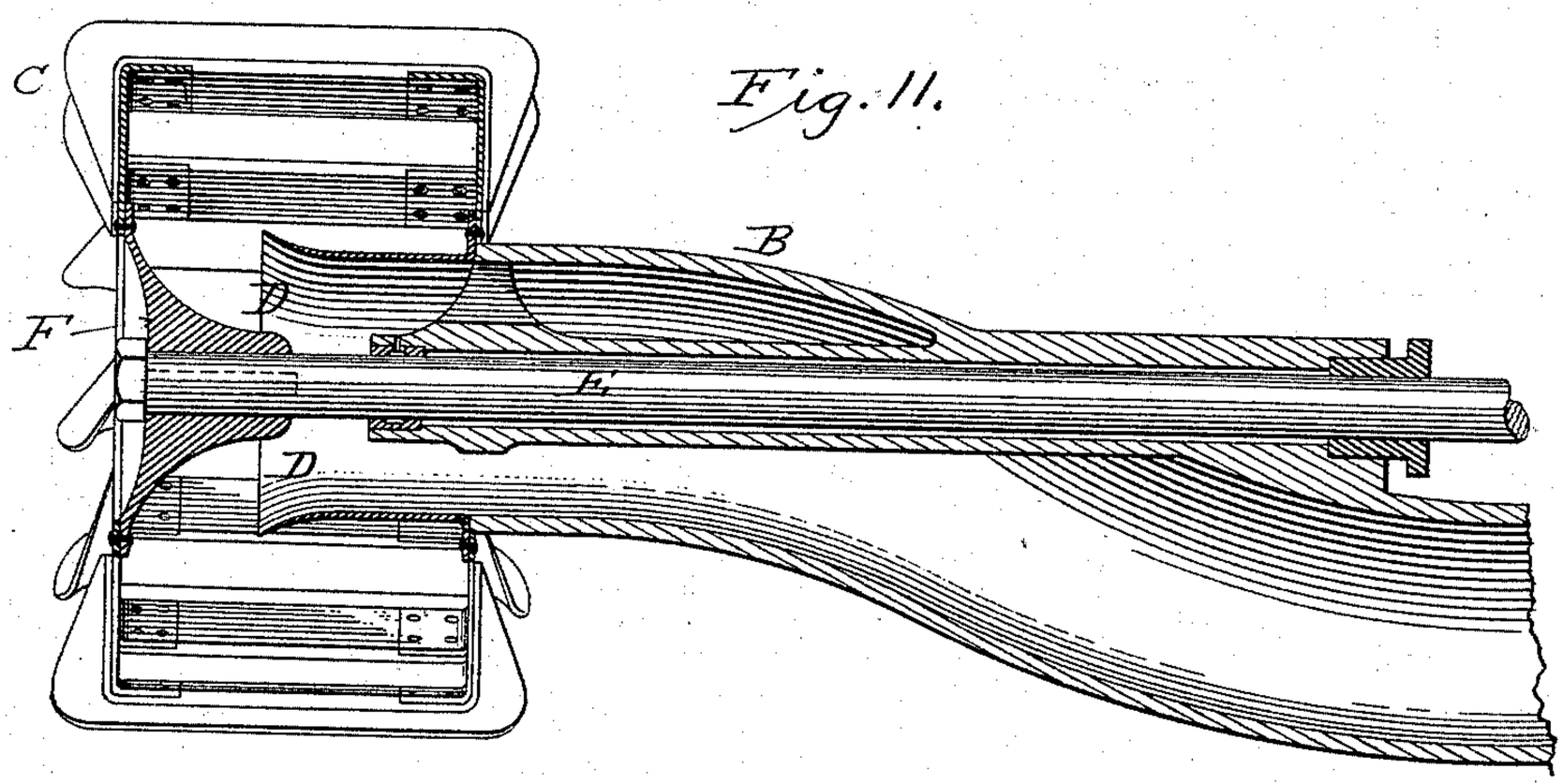
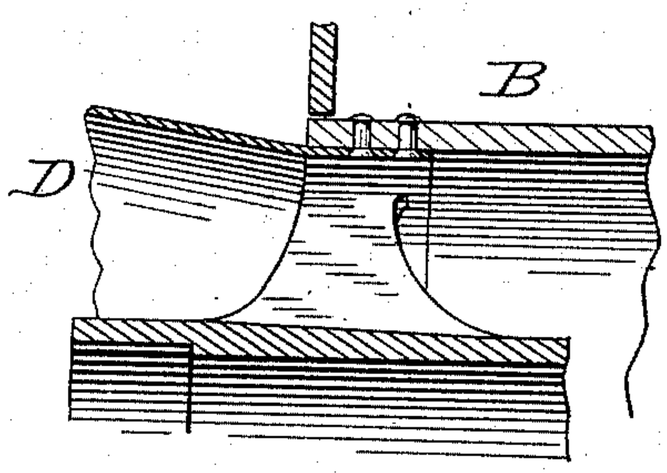


Fig. 12.



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UNITED STATES PATENT OFFICE.

LINDON W. BATES, OF CHICAGO, ILLINOIS.

CUTTER FOR DREDGERS, EXCAVATORS, &c.

SPECIFICATION forming part of Letters Patent No. 526,514, dated September 25, 1894.

Application filed March 13, 1894. Serial No. 503,435. (No model.)

To all whom it may concern:

Be it known that I, LINDON W. BATES, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Cutters for Dredgers, Excavators, &c., of which the following is a specification.

My invention relates to excavators, hydraulic dredging machines, and like machines, and has reference more particularly to the cutter thereof.

In the drawings,—Figure 1 is an end elevation of my improved cutter; Fig. 2, a side view; Fig. 3, a longitudinal sectional view; Figs. 4 and 5, face and edge views of the head or disks; Figs. 6, 7, 8 and 9, detail views of the knives, and Figs. 10, 11 and 12, views illustrating certain details.

A A represent two circular heads or disks, made from a single piece of steel, with substantially radial arms or spokes *a*, whose outer ends are bent laterally to form a series of peripheral flanges *b;* and also formed with a central hole or orifice *c* to fit upon the end of the rotatable pipe-section B. These heads are connected by means of longitudinal knives C of the form shown in Figs. 1, 2, 3, 6, 7, 8 and 9. The knives comprise a straight and flat main body portion *d*, from which projects upwardly and forwardly the cutting edge *f*,—the said main body and the cutting edges or surfaces being carried downward at the ends so as to embrace between such ends, the arms or spokes *a'* of the heads to which they are riveted or bolted.

It will be noticed by reference to Figs. 3, 7, 8, and 9, that at the inner corners of the knives they are recessed, as at *g*, to afford a good seat for the flanged or bent ends *b* of the arms *a*, and that the main body of the knives projects downward between the inner ends of the flanges *b*, thereby effectually preventing the outer disk or head from being forced toward the inner head or disk when the cutter is doing end-work. The knives shown in these figures are made of cast steel, but where they are made of forged boiler-plate, the heads or disks will first be connected by plates or strips *h*, Fig. 10, and the knives riveted to said strips as well as to the flanged spokes.

When the knives are applied to the heads or disks, the cutting edge of one should be about five inches (in a cutter of a diameter of five feet) in rear of the back edge of the knife next in front, so as to afford ample space for the loosened material to enter the interior of the cutter. If the cutting edge or flange were of the same width, from front to rear throughout its length, the spaces or openings between the arms *a* would be covered or closed too much, so, in order to avoid this, and leave as much space as possible for the material to enter, the cutting edges of the knives taper or incline backward at the ends so that when looking at the end of the cutter (Fig. 2), the forward edge of the ends of the knives appears parallel with the rear edge of the knife next in front. In order to increase the suction and the delivery of the material to the suction pipe, I provide said pipe or the cutter with a funnel D,—shown in dotted lines in Fig. 3 and in full lines in Figs. 11 and 12,—which has its outer end flared slightly.

This reversible cutter may, if desired, be applied to or mounted upon a fixed suction pipe, as in Fig. 11, in which case the pipe will be provided with a longitudinal bearing for the cutter-rotating shaft E. By employing this rotating shaft I am enabled to use in connection with the funnel D, a conical directing head F which, in the present instance, forms the connection between the shaft and the cutter. The apex of this casting extends into or toward the funnel, and thereby effectually increases the suction and proper discharge of the material. The funnel and the casting do do not interfere with the reversibility of the cutter,—it being only necessary in reversing the cutter to place the casting in the place of the funnel, and the funnel in the place of the casting. If desired, the funnel may be secured to and carried by the fixed suction pipe, as in Fig. 12, instead of being carried by the cutter as in Figs. 3 and 11.

As the knives are formed alike at opposite ends, and as the heads or disks are similar in all respects, the cutter as a whole may be taken off the suction pipe and reversed end for end, and thus bring into action a new set of end-cutters.

The central opening in the outer disk or head will be grated or screened by bars *i*, or

in any equivalent manner, to prevent stones or large clods from getting into the suction pipe.

Having thus described my invention, what I claim is—

1. A cutter for excavators, dredging machines, &c., having knives with cutting edges at both ends, whereby it may be reversed end for end.

2. In combination with suitable cutter heads or disks, the knives extending longitudinally and also over the heads.

3. In combination with a suction pipe; a reversible cutter; an open ended funnel; and a conical casting separate from the cutter and axially in line with the funnel, substantially as shown and described.

4. In combination with a fixed suction pipe; a reversible cutter; a cutter-operating shaft having a separate conical casting thereon; and an open ended funnel axially in line with the casting and the suction pipe.

5. In combination with the flanged heads or disks, the knives extending from one head to the other, and recessed where they fit upon the flanges.

6. In combination with the flanged heads or disks, the knives extending from one head to the other and partially over the outer faces of said heads.

7. In combination with heads A A having the separated flanged arms *a*, the knives extending from one head to the other, and having their ends applied to the outer faces of said arms.

8. In combination with heads A having arms *a*, the knives having the forwardly-projecting cutting edges,—the said cutting edges receding or inclining backward at the ends of the knives.

9. In combination with two heads A A, having arms *a* whose outer ends are flanged or bent; the knives extending from one head to the other with a portion of the main body of said knives between the opposing ends of the arms.

In witness whereof I hereunto set my hand in the presence of two witnesses.

LINDON W. BATES.

Witnesses:

CHAS. H. WHITE,

R. N. FOWLER.