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PATENTED OCT. 8, 1907.

G. McC. BROWN.
DREDGING MACHINE.
APPLICATION FILED FEB. 8, 1907.

3 SHEETS—SHEET 1.

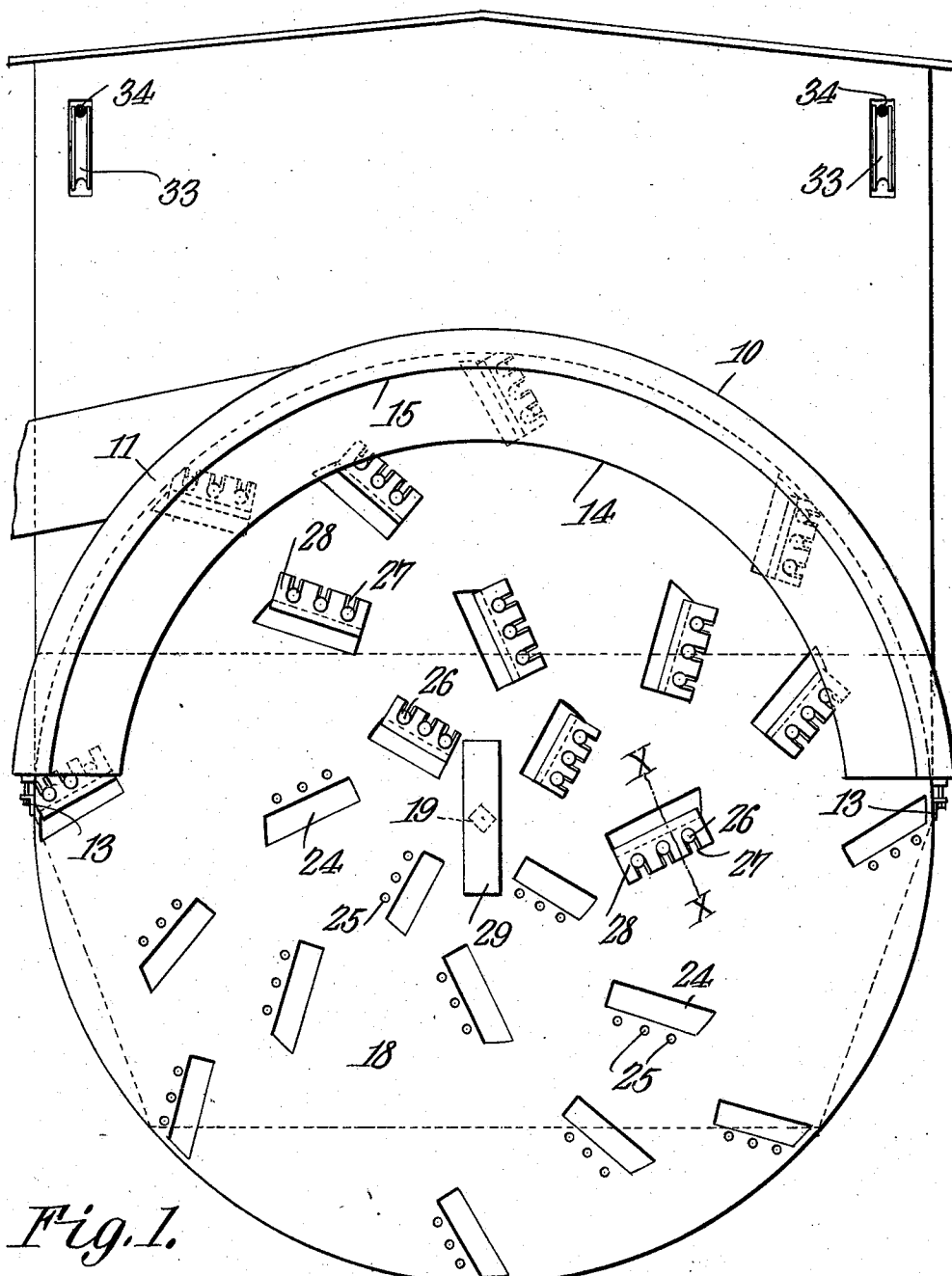


Fig. 1.

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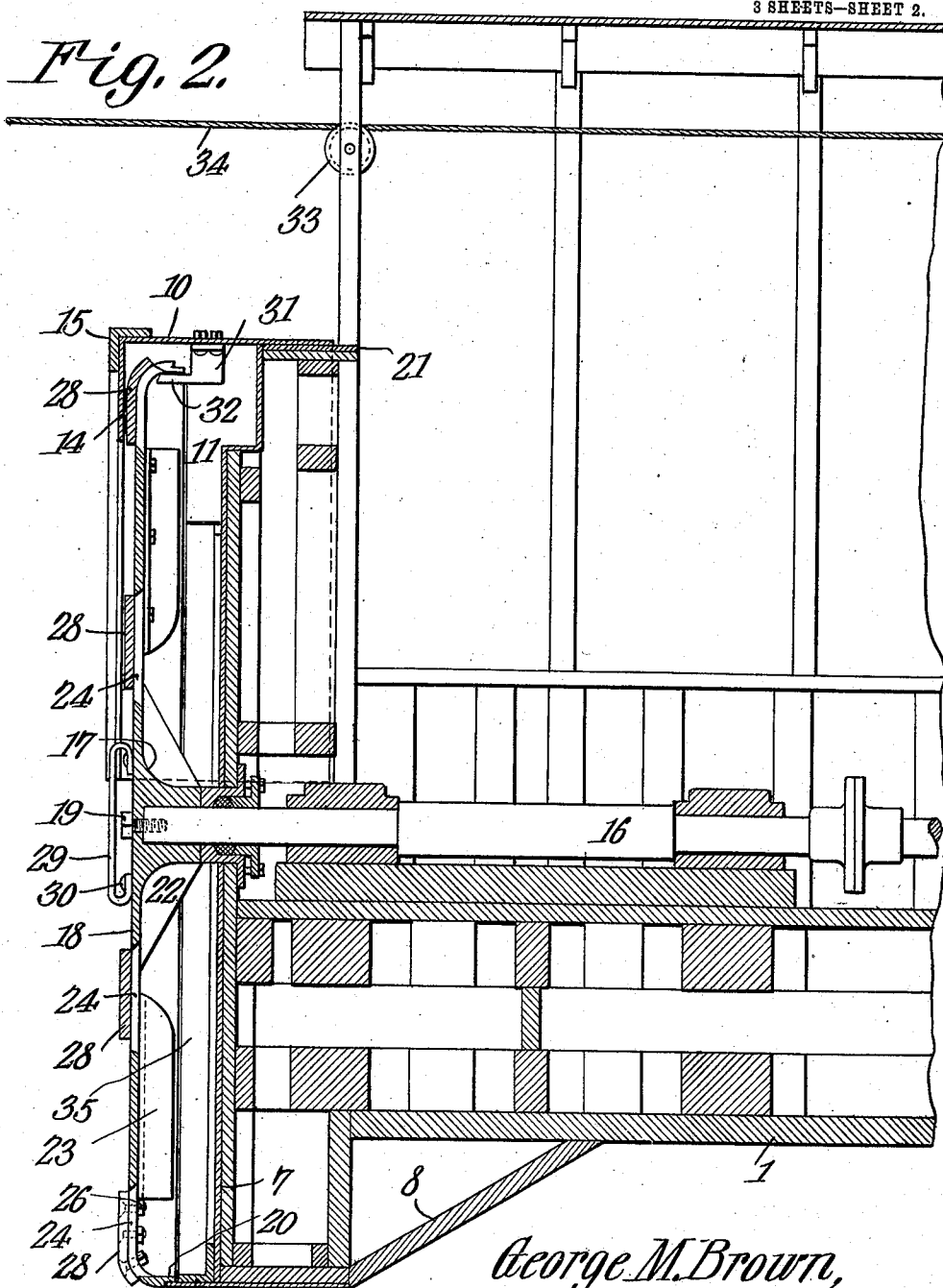
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3 SHEETS—SHEET 2.

Fig. 2.



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3 SHEETS—SHEET 3.

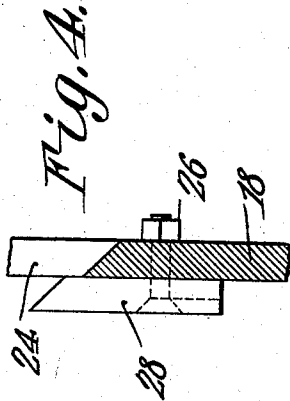
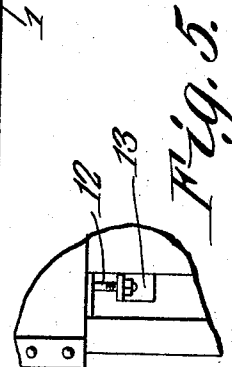
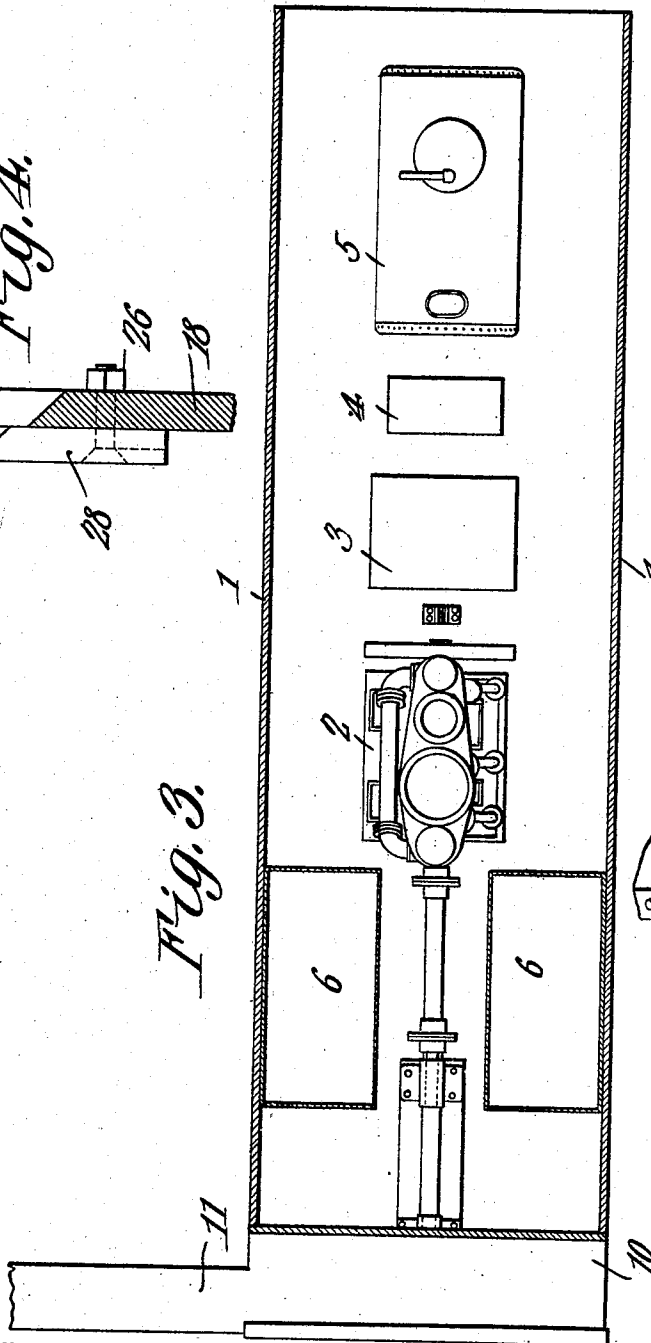


Fig. 3.



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UNITED STATES PATENT OFFICE.

GEORGE McCLELLAN BROWN, OF TACOMA, WASHINGTON.

DREDGING-MACHINE.

No. 867,788.

Specification of Letters Patent.

Patented Oct. 8, 1907.

Application filed February 8, 1907. Serial No. 356,421.

To all whom it may concern:

Be it known that I, GEORGE McCLELLAN BROWN, a citizen of the United States, residing at Tacoma, in the county of Pierce and State of Washington, have invented a new and useful Dredging-Machine, of which the following is a specification.

This invention relates to dredging machines, and is more particularly designed for cutting drainage channels in marshy soil.

10 The object of the invention is to provide a floating structure having a cutter at one end thereof of sufficient size to produce a channel through which said structure can move.

A still further object is to provide a cutter having 15 detachable cutting elements all of which are readily accessible and can be easily changed.

A still further object is to provide means whereby the loosened soil can be withdrawn from the cutter and discharged at the side of the formed channel.

20 With these and other objects in view, the invention consists of certain novel features of construction and combination of parts which will be hereinafter more fully described and pointed out in the claims.

In the accompanying drawings is shown the preferred 25 form of the invention. In said drawings—Figure 1 is a front elevation of the apparatus, some of the knives of the cutter being removed; Fig. 2 is a central longitudinal section through the front end of the apparatus; Fig. 3 is a horizontal section through the apparatus, the 30 cutter and its casing being shown in plan and the relative positions of the various parts of the mechanism upon the floating structure being disclosed diametrically; Fig. 4 is a section on the line $x-x$ of Fig. 1, and Fig. 5 is a side elevation of a portion of the head and 35 showing the hood-adjusting means.

Referring to the figures by characters of reference, 1 is a floating structure of any suitable form, preferably similar to a barge, and arranged on this structure is a cutter-driving engine indicated generally by the numeral 2, a hoisting engine 3, a pump 4 and a boiler 5. 40 These various mechanisms are disposed along the longitudinal center of the structure so that the weight thereof will be evenly distributed and said structure caused to ride properly. Tanks 6 are also preferably located upon the structure for holding oil. The entire 45 barge is preferably formed with a housing so that the mechanism thereon may be protected from the elements.

Secured upon the front end of the structure is a head 50 7, preferably circular in form and having suitable reinforcing braces 8 between the lower portion thereof and the bottom of the barge. This head is of the same diameter as the width of the barge and is so positioned as to project below the hull thereof. An annular flange 55 9 extends forward from the periphery of the head 7 and terminates adjacent the top of the head. An arcuate

hood 10 is arranged above the upper portion of the head and has an outlet spout 11 integral therewith and extending therefrom at a tangent, and this hood is adjustably connected to the sides of the head, preferably by means of bolts 12 adjustably mounted within brackets 13. The hood has an inwardly-extending flange 14 at the outer edge thereof, and the connection between this flange and the hood is preferably reinforced by means of an angle iron 15. 60 65

The engine 2 is adapted to drive a shaft 16 mounted in suitable bearings and extending through the center of the head 7. This shaft projects into a boss 17 extending inwardly from the center of the cutter-head 18, said head being secured to the end of the shaft, preferably by means of a bolt 19 extending through the head and into the shaft. If preferred, the end of the shaft can be squared and the socket in which it is seated similarly shaped so as to prevent independent rotation of the shaft and cutter head. The cutter head is positioned to rotate beneath the hood 10 and has its edge turned inward and formed with an annular groove 20 adapted to receive a sheathing 21 surrounding the head 7 and its flange 9 and formed of heavy sheet material or any other suitable material. The edge of the cutter-head is normally disposed close to the flange 9 and its sheathing 21 serves to close the space formed between the flange and said cutter-head. Webs 22 are preferably cast integral with the cutter-head and its boss and serve to strengthen said cutter-head. These webs also act as fan blades and cooperate with angular blades 23 which are bolted or otherwise fastened upon the inner face of the cutter-head at desired intervals. These blades and the webs are designed, when the cutter-head is rotated at a high speed, to throw any material which may accumulate between the cutter-head and the head 7 out through the tangentially-disposed spout 11. Formed within the cutter-head at desired intervals are elongated apertures 24 disposed at angles to the radii. These apertures are also preferably disposed in circular series, the circles described about the outer ends of the apertures of each series intersecting the inner ends of the apertures of the next adjacent series. It will be noted by referring particularly to Fig. 1 that five of these series are utilized, there being four apertures in each series except the 5th or outer series, in which eight apertures are utilized. This outer series is formed within the concavo-convex portion of the cutter-head, and said apertures are formed close to the periphery of the head, as disclosed in Fig. 2. A series of perforations 25 is formed adjacent one wall of each of the apertures 24, and these perforations are adapted to receive bolts 26 which are seated within slots 27 formed in a blade 28, the cutting edge of which is beveled and is disposed in front of the adjoining aperture 24. By tightening these bolts the blades can be securely 100 105 110

clamped upon the cutter-head, and inasmuch as the ends of the bolts are readily accessible any one of the blades can be easily removed for the purpose of sharpening it or substituting a new one therefor. It will be noted that the blades of the outer series are curved so as to conform to the contour of the cutter-head. Secured upon the central portion of the cutter-head is a central cutter 29, the edge of which is disposed in a plane parallel with the head while its ends are intumed, as shown at 30, and bolted or otherwise detachably secured to the head. It will be noted that the end portions of the center cutter intersect the path described by the inner series of cutters 28. Secured within the hood 10 is a scraper 31 having an arm 32 which projects into the cutter-head and is adapted to contact with the downwardly-extending edge portion thereof.

Sheaves 33 are mounted within the sides of the front of the barge and are adapted to support cables 34 which may be driven by the engine 3.

In using this device the cables 34 are anchored at points beyond the front of the apparatus and the pump 4 and the cutter-head 18 are set in motion. By pulling in on the cables 34 the entire apparatus will be forced against the bank to be cut and this movement may be increased or diminished at the will of the operator. The rapidly rotating head 18 will cause the cutters 28 and 29 to cut away the bank in concentric circles, the path of each series of cutters extending into the path of the next adjoining series so that a smooth cut will be produced by all of the blades. The pump 4 is connected in any suitable manner with the cavity 35 formed between the cutter-head and the head 7, and when the cutter-head is not rotating at a high speed the suction created by this pump will be sufficient to withdraw from the cavity any of the mud which may have been cut. It is of course understood that this mud enters the cavity through the openings 24 adjacent the blades 28. When the cutter-head rotates at a high speed the blades 23 and webs 22 will act as fans to throw the mud outward through the spout 11. It will be seen that the diameter of the cutter-head is greater than the width or draft of the hull and, therefore, the channel produced by the rotation of this cutter-head will be of sufficient size to permit the scow to be moved forward therein. The depth of the cut can be regulated in any desired manner, as by pumping water into or out of the scow so as to lower or raise the same within the water.

Having thus described the invention, what is claimed is:—

1. In an apparatus of the character described, the combination with a floating structure, of a rotary cutter-head at one end of said structure, the diameter of said cutter-head being greater than the width or draft of the structure, and an adjustable hood supported above the cutter head.

2. In an apparatus of the character described, a cutter-head comprising a disk having an intumed peripheral portion, said disk being provided with concentric series of apertures, the apertures of each series projecting between the apertures of the next adjoining series, and a cutting

blade detachably secured to the head adjacent each of said apertures.

3. In an apparatus of the character described, a cutter-head comprising a disk having a concentric series of apertures therein, the apertures of each series projecting between the apertures of the next adjoining series, each aperture being disposed at an angle to the radius of the disk, and a cutting blade adjacent each aperture.

4. In an apparatus of the character described, the combination with a cutting disk having a plurality of apertures therein, said apertures being arranged in concentric series and the apertures of each series projecting between the apertures of the next adjoining series; of a cutting blade secured to the head adjacent each aperture, and a central cutter having intumed ends secured to the head adjacent to the center thereof, said center cutter extending between the apertures of the inner series.

5. In an apparatus of the character described, the combination with a floating structure having a head at one end and a sheathing adjacent the head of the structure and overlapped by said sheathing, said cutter-head having a plurality of apertures, there being a cavity between the two heads, a hood adjustably mounted above the heads, an outlet spout extending therefrom, cutting blades upon the head adjacent the apertures, and means for directing the material from the cavity and through the spout.

6. In an apparatus of the character described the combination with a floating structure; of a rotary cutter head at one end of said structure, the diameter of said cutter head being equal to or greater than the width and draft of the structure, there being a continuous cavity between the head and the end of the structure, adjustable means upon the head for cutting material and directing it into the cavity, and revoluble means within the cavity for expelling said material therefrom.

7. In an apparatus of the character described the combination with a floating structure; of a revoluble cutter head at one end thereof, the diameter of said head being equal to and greater than the width and draft of said structure, said head having concentric series of apertures, the apertures of each series projecting between the apertures of the next adjoining series, there being a continuous cavity between the cutter head and the end of the structure, said cavity having an outlet, and a cutting blade detachably secured to the cutter head adjacent each of said apertures.

8. In an apparatus of the character described the combination with a floating structure; of a revoluble cutter head at one end thereof, the diameter of said head being equal to or greater than the width and draft of said structure, said head having concentric series of apertures, the apertures of each series projecting between the apertures of the next adjoining series, there being a continuous cavity between the cutter head and the end of the structure, said cavity having an outlet, a cutting blade detachably secured to the cutter head adjacent each of said apertures, and revoluble means within the cavity for expelling material through the outlet.

9. In an apparatus of the character described the combination with a floating structure; of a rotary cutter head at one end of said structure having a plurality of apertures, a cutting blade detachably secured to the head adjacent each aperture, said blades being disposed to cut along intersecting paths, and a central cutter upon the head having end portions secured to the head adjacent the center thereof.

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

GEORGE McCLELLAN BROWN.

Witnesses:

HARRY H. BROWN,
A. A. KNIGHT.