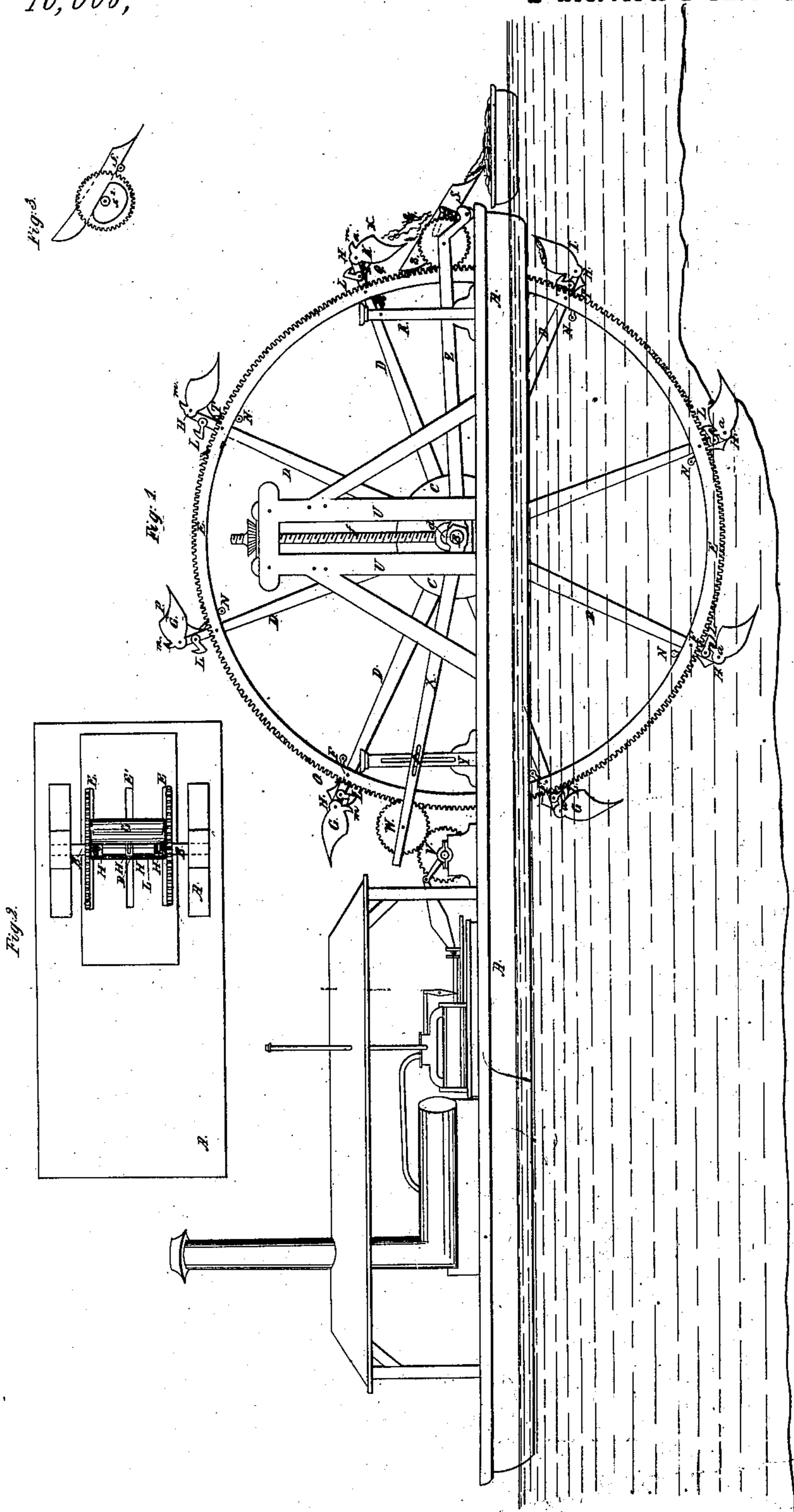


Fonde & Lyons.

Dredger,

N<sup>o</sup> 10,668,

Patented Mar. 21, 1854.



# UNITED STATES PATENT OFFICE.

C. H. FONDÉ AND T. B. LYONS, OF MOBILE, ALABAMA.

## DREDGING-MACHINE.

Specification of Letters Patent No. 10,668, dated March 21, 1854.

*To all whom it may concern:*

Be it known that we, CHARLES H. FONDÉ and THOMAS B. LYONS, of the city and county of Mobile, State of Alabama, have  
5 invented a new and useful Machine for Dredging or Deepening Channels of Rivers, Harbors, Canals, Docks, &c.; and we do declare that the following is a full, clear,  
10 and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1 is a side elevation of the machine. Fig. 2 is a plan of the deck showing  
15 a portion of the excavating wheel and one bucket. Fig. 3 is a side elevation of the tipper arranged for being operated by a cam.

Similar letters of reference in the several  
20 figures indicate the same part of the machine.

To enable others skilled in the art to make and use our invention, we will proceed to describe its construction and operation.  
25

We construct a boat or barge with a flat deck of the requisite dimensions, marked A, A; from the center of the barge extending forward is a large pit or opening, see  
30 Fig. 2. In this opening or pit works our large excavating wheel, the iron shaft B crosses the center of the pit; upon this shaft are three or more iron flanges similar to those used on paddle wheels, marked C;  
35 each flange has eight arms of oak or iron, marked D; near the ends of these arms and on the outer sides of the wheel are two large cog rims or wheels, one of which is shown, marked E E; this wheel or rim is put on  
40 in segments and bolted to the arms as at F; a straddle or strap spanning each on the back, for further security may be added; there are corresponding rings without cogs, to brace the arms of the center flange or  
45 flanges (E<sup>1</sup> Fig. 2), the arms passing through a mortise in the rings, these center rings being broader but not so deep as the outside cog rims, or rings; the ends of all the arms extend out beyond the rings to receive the buckets or scuppers. We are now  
50 describing a wheel with eight buckets or scuppers and three sets of arms, that is three flanges on the main shaft, although a greater number of bucket arms and flanges may be used. The scuppers or buckets are  
55 to be made of boiler-iron; they are of an

irregular half cylindrical form G G; they are first firmly riveted to a cast-iron bed-plate, from which project three sets of lugs or ears, H, H, two on each end and two in  
60 the middle, so placed as to receive arm ends between each pair, the buckets are then secured to the ends of the arms by a round rod of iron (a) passing through the ears and arms secured by a nut on each end;  
65 the buckets must now turn upon this bar as upon a pivot or hinge, so as to set at one time on top of the arm as at I, and again to turn over and hang under the arm at  
70 at K.

We will now describe the latch or dog that holds the scuppers firmly on top of the arms while they are digging, as at L, L; these latches extend the whole length of the  
75 bucket; the drawing only shows the profile of them; they are intended to latch on to a projecting ledge of the bedplate of the bucket *m, m*; these catches or dogs are pivoted on to the arms in the same manner as  
80 the buckets or scuppers, that is by three sets of lugs and a round iron bar upon which they work; on two of these lugs, to the two inner ones of the outside pairs are attached  
85 two small levers with a weight on the end N, N; this weight so adjusted as to be an equal counterpoise to the catches when they reach the point O on the circumference; it  
90 will now be perceived that the bucket, P, when it reaches the point, O, will overset by its own weight passing the center of gravity, the rounded surfaces of the heads  
95 of the catches coming in contact with the rounded under surface of the projecting ledge of the bedplate of the bucket; they will pass each other and become firmly  
latched where it holds while digging and raising, till it gets to the discharging point, 2, where it is discharged in the following  
100 manner. The weights on the ends of the levers N, N, have a small horizontal bar, marked *i*, that projects under the cog rim; now as the full bucket comes up this small  
bar comes in contact with a roller fixed on the permanent post R, (which post is firm  
105 to the deck on the edge of the pit) consequently forcing the weight downward which lifts the latch from the ledge when the bucket immediately overturns throwing its  
110 contents into the tipper S. There is a small hump on the under side of the ends of the arms with a curved face to receive the buckets back when they overturn and

prevents them from going over too far; T, the curved face may have a cushion of vulcanized india rubber or gutta percha, to break the fall of the bucket. This wheel  
 5 when put together will resemble somewhat a large steamer's paddle wheel, the scuppers being placed like the paddle boards; the scuppers may also be made only half the width of the wheel, and placed so as to  
 10 break joints like the paddle wheels now in use; you would then have to have two sets of catches and two tipper, which would load two scows at once, this completes the description of the excavating wheel.

15 The pillar blocks which contain the journals of the main shaft are fitted in four large slots bedded in the upright gallows frames U, U; attached to the pillar blocks by a fork *d*, is a large screw *f* running up  
 20 through the plate or cross-beam, on top of of this beam is a large nut with a ratchet wrench so that two men on top of each frame with a ratchet wrench could raise or lower the wheel to the required depth, or  
 25 this could be effected with cog wheels and belts geared to the engine so that the engineer could raise or lower the wheel by a brake, but the most approved plan on large machines would be by hydraulic pumps.

30 We will now describe the manner in which the power is applied to turn this large wheel. The engine turns the cog pinion, V, which is meshed with the intermediate pinion W, which matches with the large cog rim  
 35 (where two engines are used, the same gearing would be on the other side). The shaft of the pinion, W, works on the end of the long arm or lever *x*, which is attached to and works upon the main shaft; this inter-  
 40 mediate pinion, W, rigged in this manner is for the purpose of keeping the large wheel always in gear with the engine; the lever or arm *x* when it has found its position is secured to the permanent post, *y*, by a clamp.

45 Next to be described is the tipper which resembles a cart body, and rests upon an axle whose journals work on the outer ends of two long arms which extend to and work upon the main shaft, Z—Z; on the inner side  
 50 of these are two pinions eight times smaller than the large cog rim and meshed with them. On the inner side of these pinions is a crank and connecting rod *r* and *s* attached to the tipper to keep it up out of the  
 55 way for the full buckets to pass, and then immediately drop it under and receive the discharge, as seen at letter V. This completes the description of the machines construction.

60 We will proceed to describe its operation of deepening water on a bar, in a river, or bay. You lower the large wheel so that it will cut say one foot deep, and then propel the boat or drag over the bar in the direc-  
 65 tion you wish to cut the channel: thus mak-

ing a furrow one foot deep and the whole width of your wheel. If you make two revolutions per minute you would cut, raise, and discharge sixteen scuppers in that time; the  
 70 the mud or sand to be discharged by the tipper into scows, which lie crosswise the bows, and under the tipper. These passages are to be repeated until the required depth of water is obtained. Or, lower the  
 75 wheel gradually till you dig a hole of the required depth and then pull up against the bank; the buckets will then cut up under the bank and the wheel will not require to be raised. When the pillar blocks are high  
 80 up in the slots they should be blocked up underneath.

The boat is propelled or kept up to its work by having paddle wheels on the ends of the shaft of the pinion V, or by a drum winding chains attached to anchors, out  
 85 ahead in the same manner as now used by other dredging machines.

The tipper may be overturned by means of a cam *x''* as shown in Fig. 3 instead of the connecting rod *r* and crank *s*.  
 90

We do not claim the wheel with the buckets or scuppers across its periphery; nor do we claim the means of revolving said wheel, or the means of elevating or depressing the same, with the view of increasing or dimin-  
 95 ishing the depth of earth caught by the scuppers. But

What we do claim as our invention and desire to secure by Letters Patent, is—

1. A tilting tipper applied to a dredging  
 100 wheel, said tipper dropping within the outer circumference of said wheel so as to be in a position to receive the mud discharged from the buckets as herein set forth.

2. Also the arrangement for causing the  
 105 tipper to tilt out of the way for the full buckets to pass, and return again to its position to receive the mud discharged; and for keeping the tipper in gear with the wheel, so that it will always perform its  
 110 duties notwithstanding the difference in their relative positions when raising and lowering the wheel.

3. We further claim the combination of the latch or dog L with the ledge of the  
 115 bed plate *m* of the bucket by means of which the bucket is adjusted and held firm while digging and raising the earth as herein set forth.

In testimony whereof, we have hereunto  
 120 signed our names before two subscribing witnesses.

CHAS. H. FONDÉ.  
 THOS. B. LYONS.

Witnesses to the signature of C. H. Fondé:

WM. P. ELLIOT,  
 JAS. D. CLAY.

Witnesses to the signature of T. B. Lyons:

SIDNEY F. DOUGLAS,  
 WM. BANCROFT.