

No. 622,532.

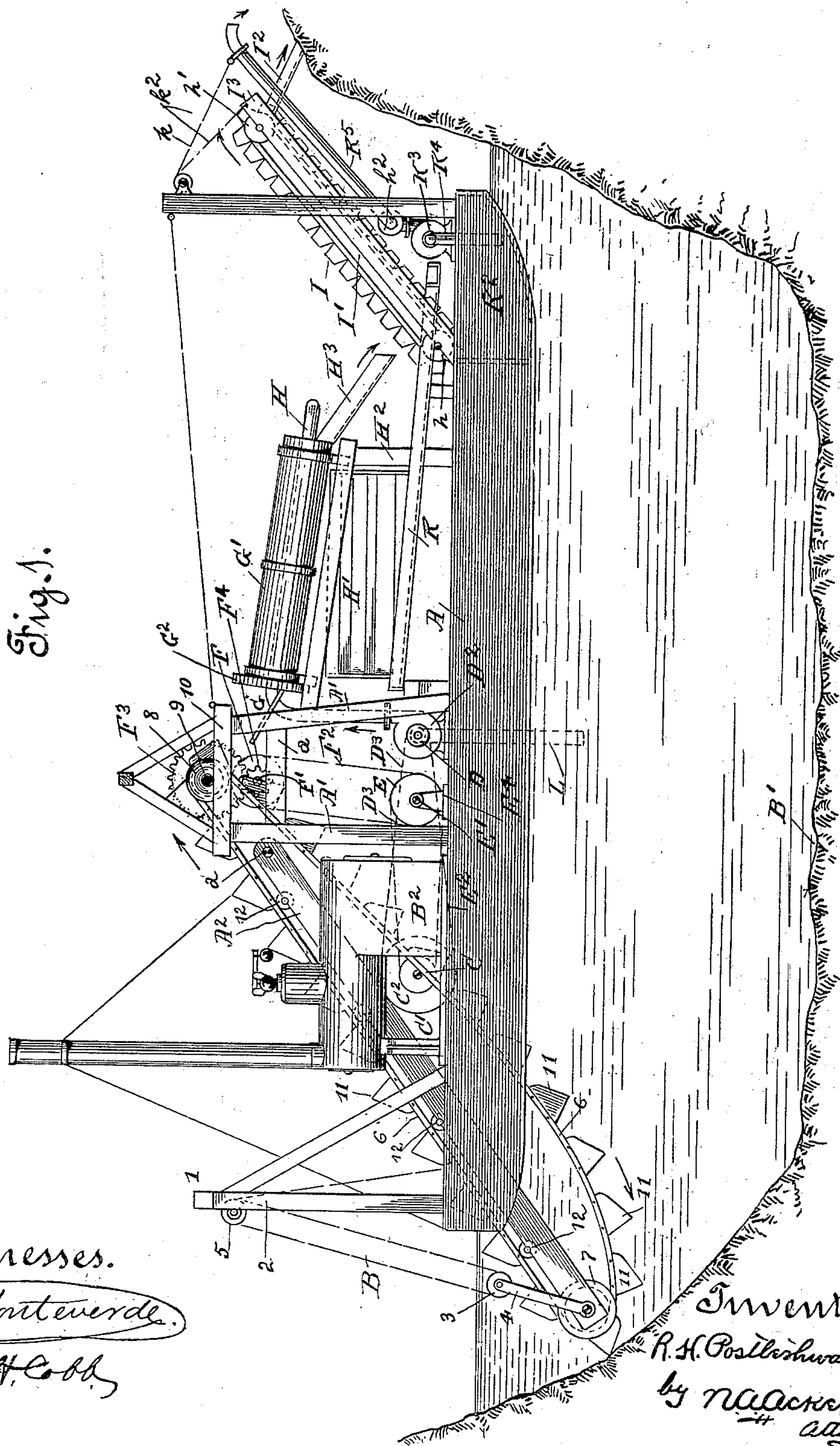
Patented Apr. 4, 1899.

R. H. POSTLETHWAITE.
GOLD DREDGING APPARATUS.

(Application filed July 6, 1897.)

(No Model.)

3 Sheets—Sheet 1.



Witnesses.

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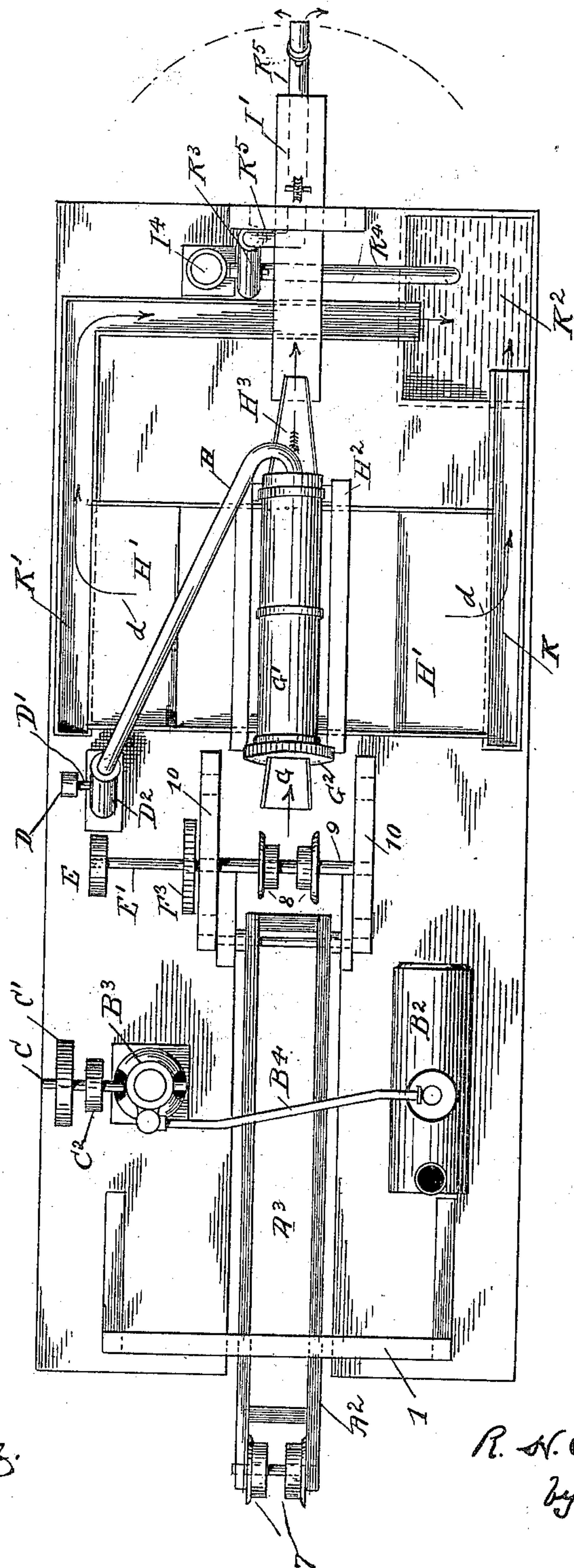
R. H. POSTLETHWAITE.
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(Application filed July 6, 1887.)

(No Model.)

3 Sheets—Sheet 2.

Fig. 2.



Witnesses.

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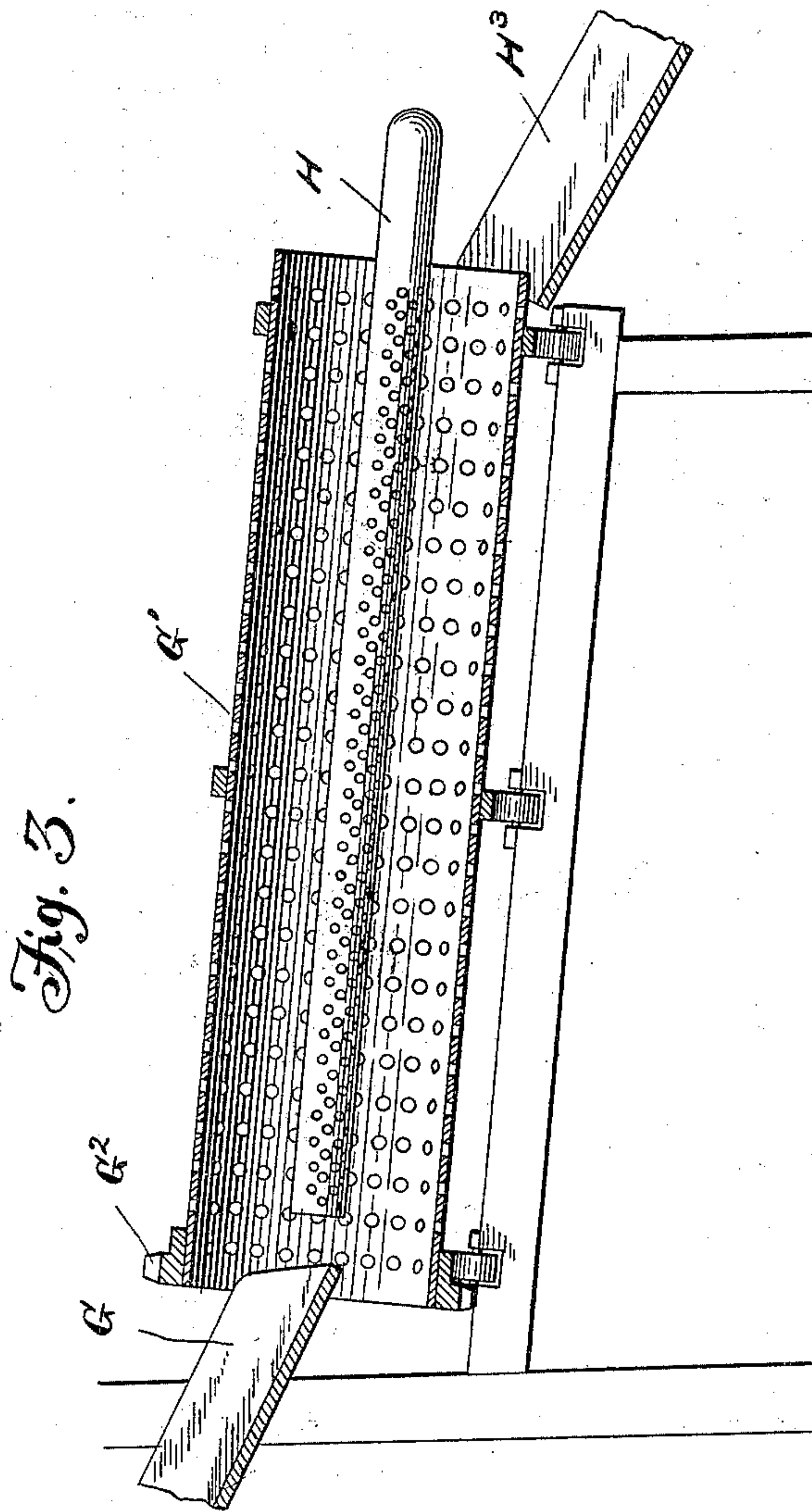
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(No Model.)

3 Sheets—Sheet 3.



Witnesses:

G. A. Pennington
Jas. S. [Signature]

Inventor:
Robert H. Postlethwaite
By R. S. Bacon
Asso. Atty.

UNITED STATES PATENT OFFICE.

ROBERT H. POSTLETHWAITE, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR
TO THE RISDON IRON AND LOCOMOTIVE WORKS, OF SAME PLACE.

GOLD-DREDGING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 622,532, dated April 4, 1899.

Application filed July 6, 1897. Serial No. 643,587. (No model.)

To all whom it may concern:

Be it known that I, ROBERT H. POSTLETHWAITE, a subject of the Queen of Great Britain, residing at San Francisco, in the county of San Francisco and State of California, have invented certain new and useful Improvements in Gold-Dredging Apparatus; and I do hereby declare that the following is a full, clear, and exact description thereof.

This invention relates to certain new and useful improvements in that class of dredgers known as "gold-dredgers," or those used for the recovery of gold or precious metal from the beds of rivers or streams; and the improvements consist in the arrangement of parts and details of construction, as will be hereinafter fully set forth in the drawings and described and pointed out in the specification.

The object of the invention is so to construct the dredge that the working of the river-bottom may be accomplished with the minimum expense in order that river-beds may be successfully and profitably worked where the percentage of gold or precious metal is very small per cubic yard or such beds as cannot be used to advantage with the dredgers now in use, owing to the fact that the expense attached to the working of the machine is greater than the value of the material recovered.

In order fully to comprehend the invention, reference must be had to the accompanying sheets of drawings, wherein—

Figure 1 is a side view in elevation showing the machine or dredge in working position within a river. Fig. 2 is a top plan view of the dredge. Fig. 3 is a vertical sectional view of the rotary grizzly, showing the water-pipe in elevation.

The letter A is used to indicate the dredge-boat, which carries the hereinafter-described mechanism. To the lower cross-pieces a of the uprights A' , placed somewhat to the rear of the dredge-boat center, is fulcrumed by rod a' the ladder A^2 , which ladder works vertically in the ladder-way A^3 , formed in the forward end of the boat. This ladder is raised and lowered by means of the cable B, connected to a cross-beam 1, supported by uprights 2. This cable runs under sheave 3,

connected to the lower end of the ladder A^2 by the arm 4, and over sheave 5, suspended from the cross-beam 1, and the free end thereof is connected to a suitable winding-drum, which is driven by suitable connections from the engine of the boat. As the cable is wound upon or slackened from the drum the ladder A^2 is raised or lowered.

The ladder A^2 supports the endless chains 6, which work over the rolls 7 and over rolls or drums 8, secured upon the cross-shaft 9, working in bearings of cross-pieces 10. These chains carry the cutting, scooping, or excavating buckets 11, which cut into the bottom B' of the river or stream and carry the cut soil upward to the dredger. The chains carrying the buckets with their load are prevented from sagging by means of the supporting-rolls 12, journaled at given intervals along the ladder A^2 .

At any given point on the boat or dredger is located the boiler B^2 , the steam of which is conveyed to the engine B^3 by the pipe B^4 . On the shaft C of the engine are mounted the belt-wheels C' C^2 . The larger belt-wheel C' transmits its motion to the belt-wheel D, mounted upon the shaft D' of the force-pump D^2 , by means of the belt D^3 , while the belt-wheel C^2 has its motion transmitted to the belt-wheel E, mounted upon a cross-shaft E' , by belt E^2 . The cross-shaft E' works in bearings of the standards E^4 , secured to the boat, (only one being shown,) and upon said cross-shaft is also mounted directly behind the belt-wheel E a second belt-wheel, (not shown,) which is connected with belt-wheel F, mounted upon the cross-shaft F' by the belt F^2 . Consequently the motion of shaft E' is transmitted to the shaft F' . Upon the cross-shaft F' is mounted the pinion F^4 , which meshes with the gear-wheel F^3 , secured upon the cross-shaft 9. By means of the mechanism just described the movement of the engine-shaft is transmitted to the cross-shaft 9, so as to impart travel to the endless chains A^2 , carrying the excavating-buckets 11.

As the buckets 11 are carried by the travel of the endless-chain carriers over the drums or rolls 8, the contents thereof are emptied upon a runway or trough G, which leads the

material into the rotary "grizzly" G' through the forward open end thereof. This grizzly is set at a slight incline, and it is formed of meshed or reticulated material, being cylindrical in cross-section. To the upper end thereof preferably is formed the cog-ring G^2 , which through suitable connections (not shown) is driven from the cross-shaft 9, so as to rotate the grizzly. Into the lower open end of said grizzly projects or extends the upper end of the water-supply pipe H , which leads from the suction-pump D^2 . This pipe extends, preferably, the entire length of the grizzly and is run near the top thereof, being perforated throughout its length within the grizzly, so as to spray its water onto the material entering the grizzly. The water flowing from this pipe into the grizzly serves to thoroughly wash and separate the material entering therein from the trough or runway G and to force the finer material from the grizzly onto the separating tables or platforms H' , arranged below the grizzly. The said grizzly is held in position by the supporting-frame H^2 , and as the same is arranged at an incline it is obvious that as the same is rotated the heavier particles, such as stones and foreign substance too large to pass through the openings of the same, will escape from the lower open end thereof onto an inclined platform or chute H^3 , arranged at that end of the grizzly.

The separating tables or platforms H' are arranged at a gradual incline and extend from beneath the grizzly to each side thereof. Of the tables or platforms there are a series arranged one above the other. Consequently the water and the finer material flowing from the grizzly fall upon the first of the inclined tables or platforms, passing thereover flow onto the next, and so on until they pass off of the lower set of tables or platforms. As the fine gold or precious metal is contained in the material flowing from the grizzly, the same will be gathered or collected as the material is passed over the separating tables or platforms. The water and the base material passing from the last set of tables or platforms enter the sluiceways $K K'$, as indicated by arrows d , and finally discharge into the sump or well K^2 , formed in the boat or dredge, (preferably at its stem end.) From this well the base material and the water are raised into the pump K^3 through the stand-pipe K^4 and forced through the discharge-pipe K^5 onto the embankment, thus being prevented from flowing back into that portion of claim bottom being dredged, while the heavier material flowing from the trough H^3 is emptied into buckets I , secured to the elevator I' , and elevated and discharged by the buckets into a runway I^2 , which conveys the same onto the embankment. The elevator I' works over the rolls or wheels $h h'$, secured within the upper and lower ends of the ladder I^3 , which ladder is fulcrumed at its lower end to the boat, so as to permit of being raised or lowered. Mo-

tion is imparted to the endless elevator by any suitable mechanism driven from the engine I^4 of the pump K^3 .

The discharge-pipe K^5 is connected to the pump K^3 by a swivel-joint h^2 , so as to be free to move in any direction, and it is raised and lowered by means of the cable k , attached thereto, while the ladder I^3 is raised and lowered by the cable k^2 .

The water for washing the material flowing into the grizzly is drawn from the river into the suction-pump through the pipe L .

As thus constructed the entire operation of dredging and recovering the gold or precious metal from the river's bottom may be conducted with very little help, as the entire working of the machine is automatic, and as the worked material is carried and deposited upon the river's bank there is no danger of the working material flowing back into the pocket or hole being dredged and reworked, which would be a useless loss of time and expense.

Having thus described my invention, what I claim as new, and desire to secure protection in by Letters Patent, is—

1. In a gold-dredging apparatus, the combination with the dredge-boat, of a swinging ladder mounted at one end thereof, the endless carriers supported by said ladder, cutting or excavating buckets secured to or carried by said endless carrier, devices for raising and lowering the elevator, mechanism for driving the endless carriers, the inclined rotary grizzly, a trough or runway for conveying the excavated material from the excavating-buckets to the grizzly, a force-pump for supplying water into the grizzly to wash and separate the material fed therein, a series of separating plates or platforms arranged at an incline below the rotary grizzly, a sump or well formed in the dredge-boat, the sluiceway leading from the platforms or tables to the sump or well, the discharge-pipe for conveying the said material from the sump, a bucket elevator, mounted upon a movable ladder, for removing the heavier material, a runway for conveying the heavier material from the rotary grizzly to the bucket elevator, and of devices for raising and lowering the elevator and the discharge-pipe.

2. In a gold-dredging apparatus, the combination with the dredge-boat, of an inclined rotary grizzly for separating the excavated material, a series of separating tables or platforms arranged at an incline beneath the grizzly, the sump or well formed in the dredge-boat, the sluiceways leading from the separating tables or platforms to said sump or well, a pump and connections for emptying said well, a discharge-pipe connected to said pump by a universal joint, the bucket elevator working over a movable ladder, a runway for conveying the heavier material from the grizzly to the bucket elevator, and of devices for raising and lowering the said ladder and discharge-pipe.

3. In an apparatus for dredging and separating the dredged material, the combination with a boat or platform, of a rotary grizzly or separator mounted thereon, devices for
5 imparting rotation thereto, means for excavating and elevating the excavative material and discharging the same directly into the rotary grizzly or separator, a perforated spray-pipe leading into the separator or grizzly from
10 the lower end thereof, a pump for forcing water into said pipe and through its perforations and under disintegrating pressure onto

the material fed into the grizzly or separator, collecting-tables arranged below the separator or grizzly and by means of which the separated metal from the dredged material is recovered. 15

In testimony whereof I affix my signature, in presence of two witnesses, this 19th day of June, 1897.

ROBERT H. POSTLETHWAITE.

Witnesses:

N. A. ACKER,
LEE D. CRAIG.