

Nov. 21, 1933.

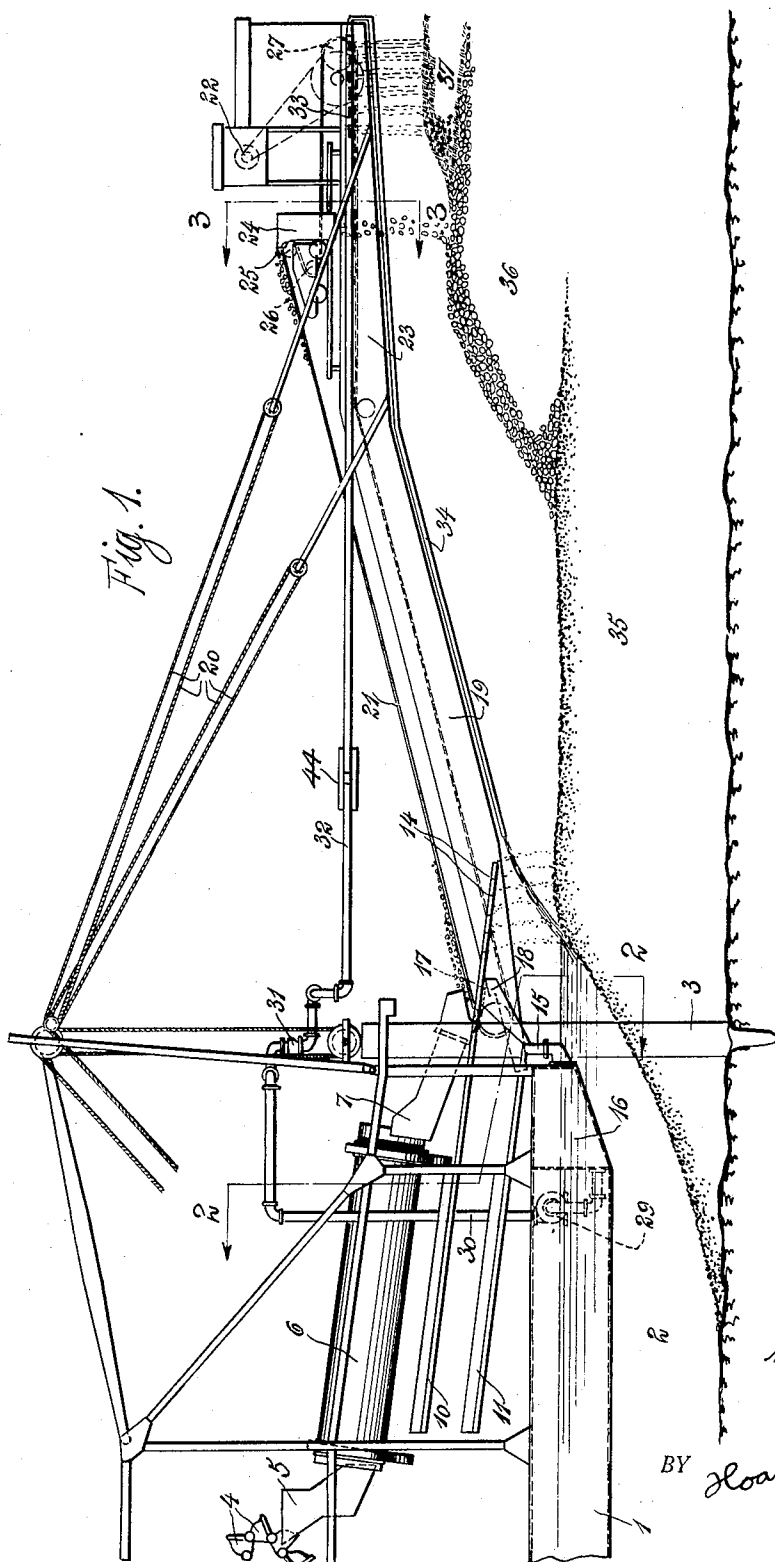
M. F. KEESE

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RESOILING DEVICE

Filed Dec. 22, 1927

2 Sheets-Sheet 1



Matthew F. Keese,
INVENTOR.

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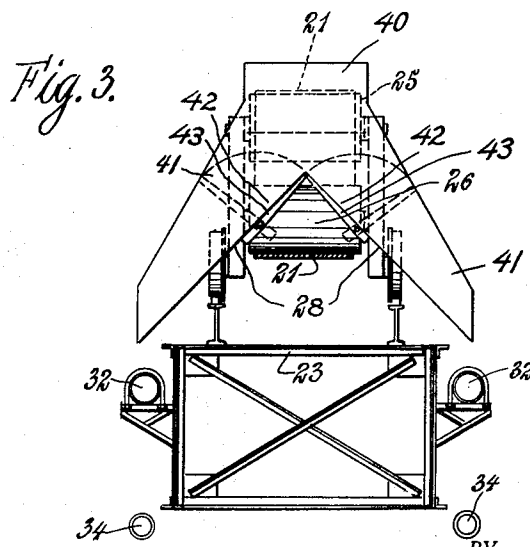
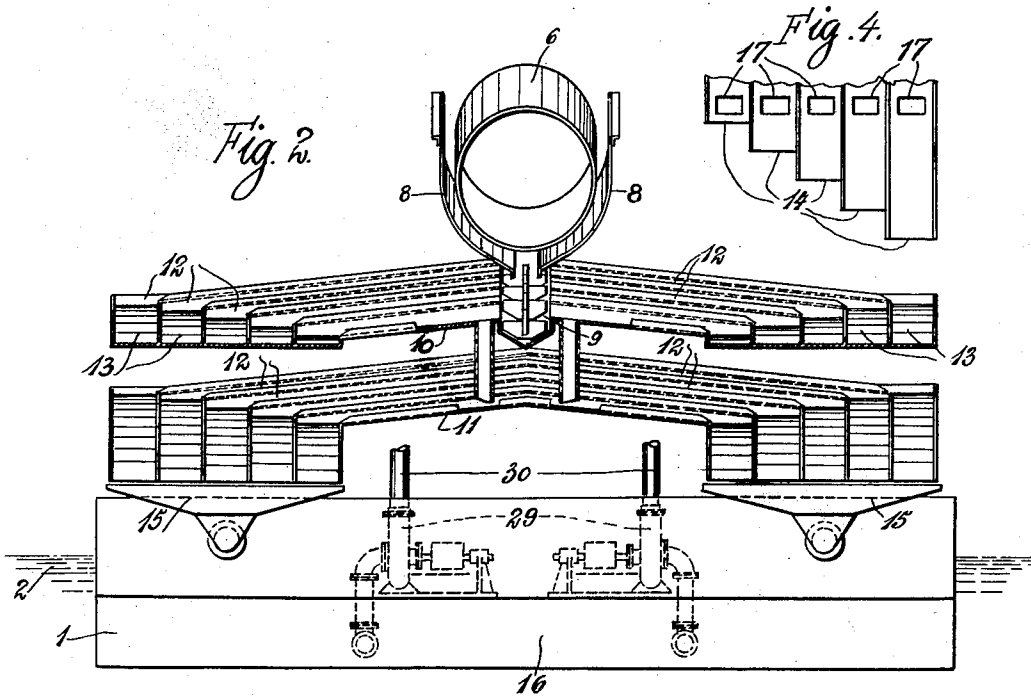
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UNITED STATES PATENT OFFICE

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RESSOILING DEVICE

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Application December 22, 1927
Serial No. 241,984

5 Claims. (Cl. 209—44)

This invention relates to placer dredges, and in particular to dredges which are required to replace the excavated material in a prescribed manner.

5 In many places the law requires that all material excavated for such purposes as placer mining or coal stripping shall be replaced with the larger stones at the bottom, then the smaller stones and coarse gravel, and finally the finer soil, suitable for tilling, on top.

My invention provides an improved mechanism fitted with various new and simple devices to accomplish such a separation and distribution of the excavated material.

15 I purpose to separate the material as to size by first running it into the usual inclined cylindrical revolving screen, which allows only the finer material to pass through the perforations, the coarser material being passed on to a conveyor belt carried on a stacker ladder, from which it is distributed upon the ground already dredged.

My stacker ladder is supported on brackets which overhang the hull of the dredge. Hence in my dredge, the ladder is not so much limited as in former constructions by the position of the spuds, but is capable of a wider swing, independent of the swing of the dredge as a whole; thus ensuring a more even distribution of the material.

25 The finer material which passes through the screen and which contains the material, such as gold, to be saved, is received on the usual distributor, whence it is delivered to the usual ore-saving tables, which consist of riffled sluices.

In order to assist in the more even distribution of the material discharged upon the ground from the ends of these tables, I have staggered the discharge ends of the upper tables. It results from this staggering combined with the swing of the dredge that, even if the dredge be moved forward a relatively large distance at each step, the material discharged from the tables is not left in transverse ridges, as in former constructions.

As another new feature of my invention, I have placed on the stacker a conveyor tripper, which is easily shiftable along the stacker a relatively large distance, so that the operator has at his command the ability to discharge the material from the conveyor over a considerable longitudinal space. My tripper hopper may also be provided with a central spout, by which the material discharged into the hopper by the belt may be dumped back on the belt and discharged

over the end of the stacker. This feature would be used in case the overburden is good soil.

Other novel and useful features of my invention will be manifest in the following.

In the accompanying drawings I have illustrated a gold-saving dredge embodying the features of my invention.

Figure 1 shows in elevation, and more or less schematically, the rear end of a dredge with my invention.

Figure 2 shows, partly in section, a view taken as indicated in Figure 1 by the line 2—2.

Figure 3 shows a vertical section taken along the line 3—3 of Figure 1.

Figure 4 is a plan view of the discharge ends of one set of the gold-saving sluices, showing the staggering.

Throughout, the same reference numbers indicate the same or similar members.

The hull 1 of the dredge is shown as floating in the pond 2, being anchored by the spud 3. The hull carries the necessary machinery (not shown) for actuating the moving parts.

The forward end of the hull (not shown) carries the usual digging ladder, upon which travels a chain of buckets, a few of which, at the upper end of the digging ladder, are shown at 4, at which place they discharge their contents into the hopper 5. The hopper pours the material into the interior of the cylindrical revolving screen 6, which allows fine material to pass through it, and discharges the coarser material into the trough 7.

The screen 6 is partially surrounded, as shown in Figure 2, by a screen casing 8, open at the bottom, so that the fine material that passes through the screen may be guided into the distributor 9. From the distributor the material is fed to the upper and lower tables, 10 and 11 respectively. These tables consist of the usual transverse and longitudinal riffled sluices 12.

The rear, or discharge ends of the longitudinal sluices 13 of the upper tables 10 are staggered, as shown at 14, Figure 4, and indicated in Figure 1, in order to ensure a sufficient spread of the discharged material in the direction longitudinal of the dredge; as otherwise the material would be heaped up in ridges whose crests are spaced apart by a distance equal to the forward "step" of the dredge.

The material discharged over the ends of the lower tables is collected by hoppers 15, and conveyed into a sump 16, in the hull 1. The purpose of this sump will be later explained.

Near the discharge ends of the longitudinal

sluices 13 of the upper tables 10, there are closable gates 17, which when opened, allow some of the material carried along the sluices to drop into a hopper 18, which also empties into the sump 16.

Water is continuously supplied, in any well-known conventional manner, to the material in the hopper 5, the screen 6, and the sluices on both sets of tables, in order to aid the disintegration of the material, and to cause the lighter portions to be carried along the sluices, while heavier material, such as gold particles, sink to the bottom of the riffles, and remain there.

The stacker ladder 19, whose construction is well known, is partially supported by the usual ropes 20. The inner end of the stacker ladder is pivoted in any convenient and conventional manner, at a point well outboard of the hull, for both vertical and horizontal swinging.

The stacker carries an endless conveyor belt 21, which carries up the stacker the material discharged upon it by the trough 7, the belt being actuated by an electric motor shown diagrammatically at 22.

The upper section 23 of the conveyor ladder 19, which normally slopes at an angle of about 15 degrees, is made horizontal to bear a track for an automatic conveyor load-tripper 24, which can be made to operate from the power of the conveyor belt, and is used to distribute the load over a considerable fore and aft range. The belt 21 passes over and around a drum 25, thence around and under a second drum 26, and thence horizontally, back to the driving drum 27 at the extreme rear end of the stacker.

The tripper 24 is arranged so that the material carried over the upper drum 25 may, if desired, be redeposited upon the belt to the rear of the tripper, and discharged at the extreme end of the stacker. This is accomplished as follows. The tripper (see Figure 3) consists in a hopper 40 and two chutes 41. The upper end of the lower side 28 of each chute is provided with an opening 42, leading onto that reach of the belt 21 which runs from drum 26 to drum 27 (see Figure 1). In Figure 3, these openings are shown closed by gates 43. Accordingly material dumped into the hopper by the belt, as the belt passes around drum 25, will be carried off laterally by the two chutes. But if the gates be swung to the position shown by dotted lines in Figure 3, they will thereby close the two chutes, and consequently all material dumped into the hopper will pass through the openings 42 onto the belt again, and thus be carried to the extreme end of the stacker. This arrangement is used when the dredge is digging barren material. Such material being mostly soil, it is desirable that it shall be distributed on top of all other material. During such use, the tripper is held stationary on the stacker.

The material deposited in the sump 16 will contain, mixed with the relatively very fine solid material, a sufficient quantity of water to allow it to be very easily pumped out of the sump by a pair of pumps 29, one at each side, as shown in Figure 2. These pumps drive the material up the pipes 30, of which one is shown in Figure 1. This pipe proceeds to the rear, and then in to the center line of the dredge, having a ball and socket joint 31 vertically above the pivot of the stacker ladder 19. From this point it proceeds a short distance rearward and thence outward to a pipe 32 which lies at one side of the ladder. This pipe 32 runs back to the horizontal portion 23 of the stacker where it opens into a dewatering box, lo-

cated at 33 quite near the extreme end of the stacker. The cross section of the dewatering box being much larger than that of the pipe 32, the velocity of the water in it will be materially decreased, the solid material being deposited on the bottom of the box and passing through holes in said bottom. Thus the solid matter will be deposited on the ground as the top layer, while the water is carried off by the pipe 34, to be restored to the pond as shown. By far the more important reason for dewatering and carrying this water away is not merely to restore the water to the pond so that it may be used over again, but is rather to prevent the water from washing the fine soil back into the pond. Thus the dewatering device becomes a very important element to insure that the fine soil will remain where it is deposited on top of the gravel.

As I have described the course of only one of the two pipes 30, of which both are shown in Figure 2, it must be understood that the other one of these pipes pursues a course exactly symmetrical with the one described, except that, as its ball and socket joint must also be exactly vertically above the pivot point of the ladder, said joint must be at a different level than the joint 31, shown. Each of the two pipes, 32 and the similar one on the other side, has its own proper dewatering box and return pipe 34.

The ball and socket joints, 31 and the similar one for the pipe on the other side, are provided to allow for both the horizontal and vertical swing of the ladder. In addition, it is necessary to provide a slip joint 44, preferably in the pipe 32 and its correlative on the other side, to allow for the slippage necessary when the stacker is raised or lowered.

The order of deposit of the material is thus seen to be as follows: The lowest layer 35 is that which is discharged from the staggered ends 14 of the longitudinal sluices of the upper table. The next layer 36 contains the material discharged on both sides of the tripper 24. The final, or top, layer 37 consists of the material brought by the pipes 31, 33 from the sump.

As the sump 16 can be supplied with all the material from the lower tables, and in addition some of the remainder of the material from the upper table can be shunted into the sump by means of the gates located at 18, near the discharge ends 13 of the upper longitudinal sluices, it is evident that there need be no lack of top soil 37.

The extra wide swing of the stacker, allowed by the fact that it is pivoted well aft of the stern, combined with the fact that the tripper 24 is shiftable along the horizontal part 23 of the stacker, permits an even distribution of the material discharged from the stacker. At the tables, a similarly even distribution is obtained by the swing combined with the staggering of the discharge ends 13 of the upper tables.

In order to avoid complicating the drawings, the usual sheds or coverings over the screen, conveyor, etc., have been omitted.

Having now completely described and illustrated one form of my invention, it is obvious that I have invented an improved form of re-soiling device that is simple and rugged; one that is capable of even distribution, in the manner prescribed by law, of the constituents of the soil dug, with a minimum of time and expense.

I purpose, however, not to limit myself to the particular form or arrangement of parts herein

described, except in so far as such limitations are specified in the appended claims.

I claim:

1. In a placer dredge for excavating the bed of a body of water, the combination of: a hull, and carried thereon: means for screening the excavated material; a conveyor for conveying the larger particles thereof beyond the hull; means for unloading said conveyor; means for liquefying the excavated material; a sump; means for separating the valuable matter from the finer excavated material, and depositing the less liquid residue overboard, short of the unloading point of the conveyor, and the more liquid residue into the sump; and means for conveying the contents of the sump overboard at a point beyond the unloading point of the conveyor; whereby the excavated material will be deposited in the following order: the less liquid residue from the separating means, then the larger particles carried by the conveying means, and then the more liquid residue from the sump.

2. In a placer dredge for excavating the bed of a body of water, the combination of: a hull, and carried thereon: means for screening the excavated material; means for conveying the larger particles thereof beyond the hull; means for unloading said conveyor; means for liquefying the finer screened material; a sump; two levels of ore saving tables, the upper rejecting its residue directly overboard, short of the unloading point of the conveyor, and the lower discharging its entire residue into the sump; and means for conveying the contents of the sump overboard at a point beyond the unloading point of the conveyor.

3. In a placer dredge for excavating the bed of a body of water, the combination of: a hull, and carried thereon: means for screening the excavated material; means for conveying the larger particles thereof beyond the hull; means for unloading said conveyor; means for liquefying the finer screened material; a sump; two levels of ore saving tables, the upper rejecting its residue overboard, short of the unloading point of the conveyor, and the lower discharging its entire

residue into the sump, the discharge-ends of the upper tables being staggered so as to sweep distinct paths when the hull is swung, and being unobstructed; and means for conveying the contents of the sump overboard at a point beyond the unloading point of the conveyor.

4. In a placer dredge for excavating the bed of a body of water, the combination of: a hull, and carried thereon: means for screening the excavated material; means for conveying the larger particles thereof beyond the hull; means for unloading said conveyor; means for liquefying the finer screened material; a sump; means for separating the valuable matter from the finer screened material, and depositing the less liquid residue directly overboard, short of the unloading point of the conveyor, and the more liquid residue of this finer screened material into the sump; and means for conveying the contents of the sump to a point beyond the unloading point of the conveyor; means for dewatering it; means for depositing it there; and means for conveying the water to a substantial distance away from the dewatered material.

5. In a placer dredge for excavating the bed of a body of water, the combination of: a hull, and carried thereon: means for screening the excavated material; means for conveying the larger particles thereof beyond the hull; means for unloading said conveyor; means for liquefying the finer screened material; a sump; two levels of ore saving tables, the upper rejecting its residue directly overboard, short of the unloading point of the conveyor, and the lower discharging its entire residue into the sump, the discharge-ends of the upper tables being staggered so as to sweep distinct paths when the hull is swung, and being unobstructed; and means for conveying the contents of the sump to a point beyond the unloading point of the conveyor; means for dewatering it; means for depositing it there; and means for conveying the water to a substantial distance away from the deposited material.

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