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DEVICES FOR DREDGING GRAVEL OR THE LIKE  
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2 Sheets—Sheet 1

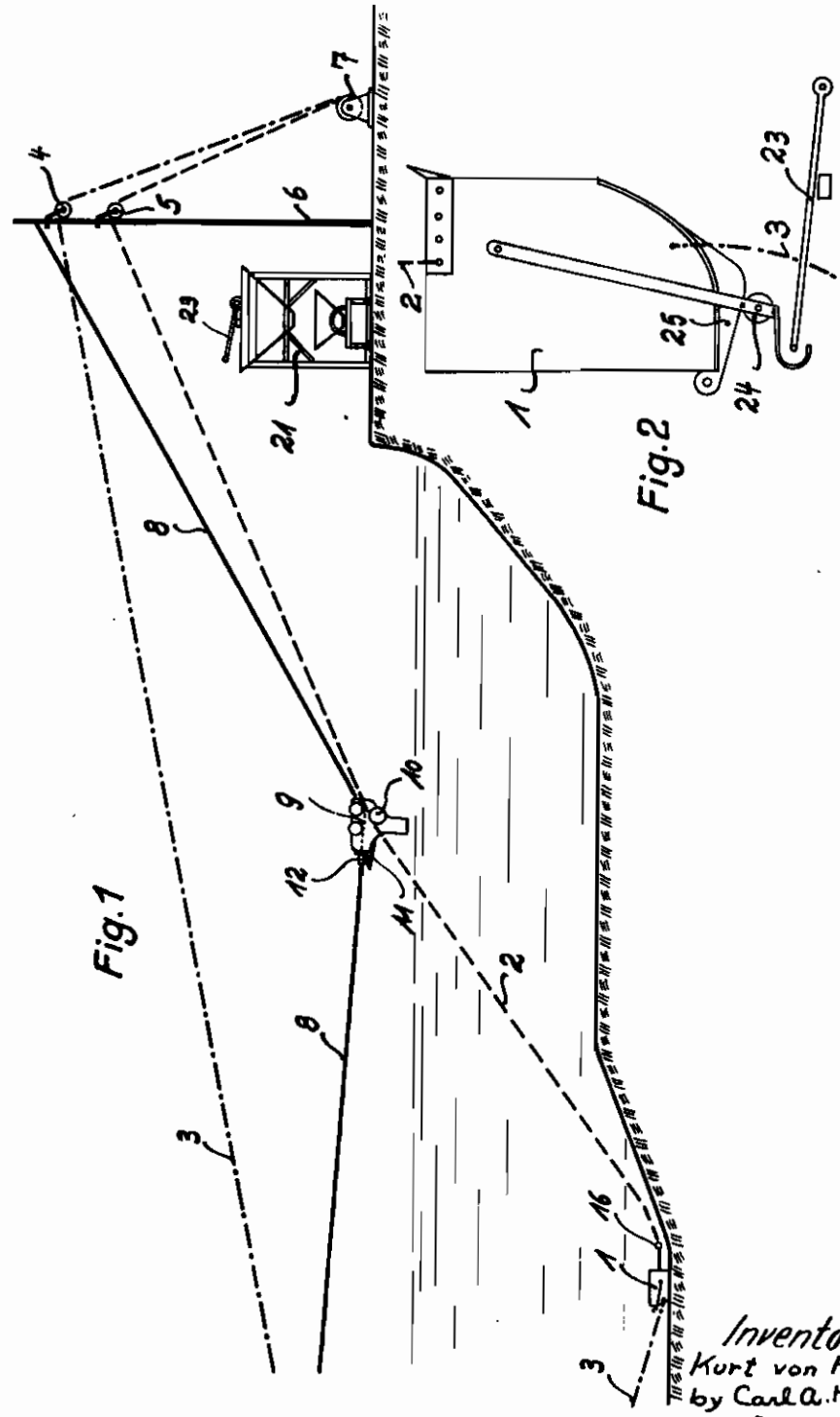


Fig. 1

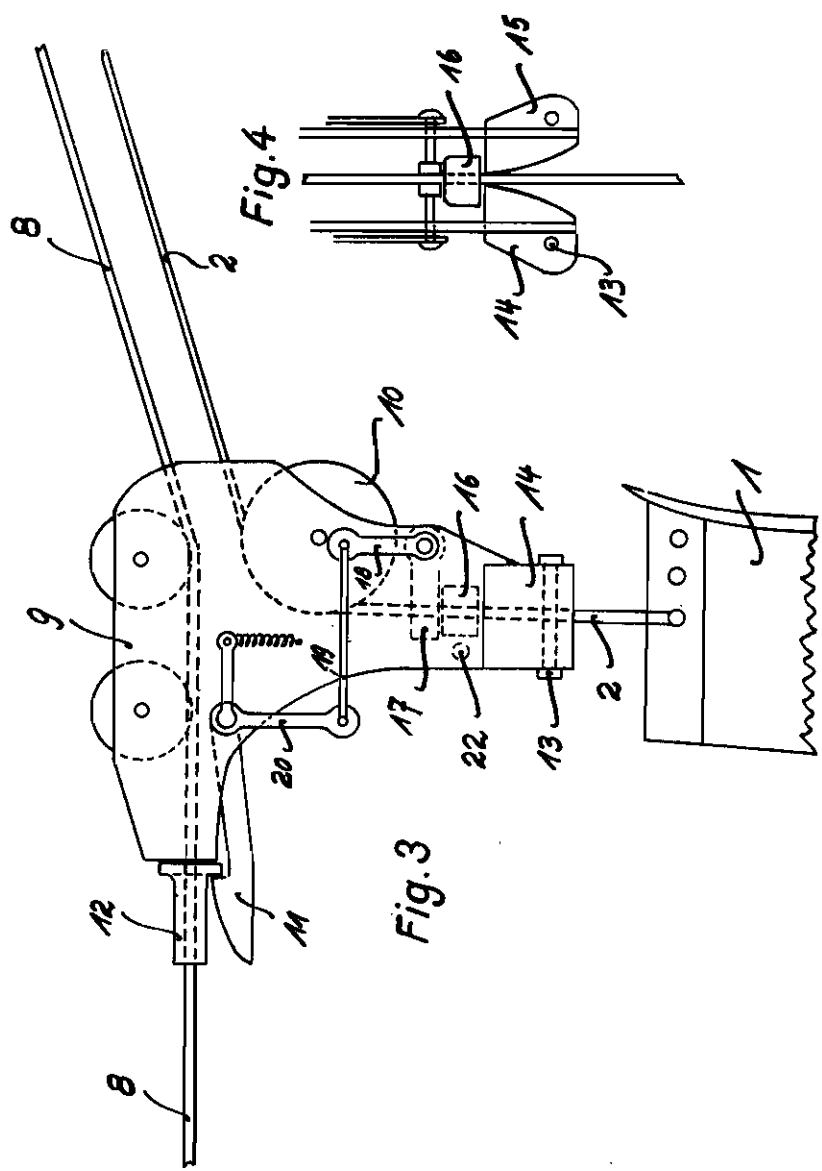
Fig. 2

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# ALIEN PROPERTY CUSTODIAN

## DEVICES FOR DREDGING GRAVEL OR THE LIKE

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vested in the Alien Property Custodian

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This invention relates to devices for dredging gravel or the like from rivers or from so-called dredge holes and the like. Up to the present time there had been used for this purpose dredging buckets operated by ropes or cables or also ordinary dredgers. Such dredging buckets are ordinarily operated in such a manner that the material to be removed by dredging is drawn by means of a bucket in upward direction along an inclined surface, whereupon said material is discharged at the end of said surface from said bucket. Thereupon the empty bucket is again brought back to the place at which the dredging is to be done. This is accomplished by means of a system of ropes or cables adapted to move said empty bucket in downward direction along said inclined surface so that said bucket will slide along said surface on the ground until it has arrived at the place at which dredging is commenced with. In this manner of operation of the bucket the useful path of motion of the bucket forms only a relatively small part of the total path of motion of the bucket with the result that the latter will be subject to considerable wear and require a relatively large power for its operation. Moreover, the known plants using dredging buckets of this kind which are drawn along an inclined plane are connected with the further disadvantage that the bucket during being moved downward along said inclined plane and over the material to be subsequently dredged will carry with it a considerable part of the latter. In case dredging is to be done under water there will in addition be the possibility that at the end of said inclined surface scored or underwashed places are likely to occur. These places evidently will have to be again filled up during the upward or working motion of the bucket, such filling up greatly impairing the efficiency of the dredging plant.

In order to attain a satisfactory relation between the total path of motion and the working path of motion of the bucket it had been proposed to transfer the latter at the end of its working stroke onto a guide band by means of some kind of switching device, in such a manner that said bucket will be carried back to the place at which dredging is again to be commenced along a path of motion above the material to be dredged. Such arrangements, however, are extremely complicated and not at all adaptable and for these reasons have not found application in practice.

My invention has for its object to provide a device for dredging gravel or other material by

means of which the bucket is lifted from the ground at the end of the working stroke with the aid of a carrying rope and a displaceable pulley block and thereupon carried freely suspending from the carrying rope to the place at which the material is discharged from the bucket. When carrying back the bucket to the place at which dredging is again to be commenced, said bucket will arrive at the ground not sooner than shortly before commencing its working stroke.

This is accomplished by my invention in an extremely simple way solely with the aid of a carrying rope which may at any time easily be fixed and of a pulley block through which the rope pulling the bucket is conducted.

In the drawings which form part of this specification I have represented an example of a construction of my new device for dredging gravel or the like from rivers, dredge holes and the like. In the drawings Fig. 1 is a diagrammatic view of an assembled device constructed according to my invention, Fig. 2 a detail view of the bucket forming part of said device, and Figs. 3 and 4 detail views of the aforesaid pulley block. Referring more particularly to the drawings, the bucket 1 is drawn in known manner by means of the pull rope 2 for forward motion of the bucket and the pull rope 3 associated with the former for backward motion of the bucket, both of said ropes being carried over rollers 4 and 5, which are fixed to a mast 6, and wound onto the drum of a winch 7.

In order to impart a positive motion to the bucket, that is in order to lift the bucket at the end of its working stroke as quickly and smoothly as possible from the ground and in order to thereupon further move the bucket in freely suspended condition, the device is equipped according to my invention with a so-called carrying rope 8 which is secured at one of its ends to the mast 6 and at the other of its ends to a point at the other side of the river or the like or on the river itself, for instance at a point of support floating on the latter. A pulley block 9 is arranged movably on said carrying rope 8, while the pull rope 2 runs over the roller 10 of said pulley block 9. The latter may be fixed on the carrying rope 8 by means of a stop 12 mounted adjustably thereon, a resilient hook or nose 11 engaging with said stop 12.

At the under part of the pulley block 9 are provided two holding members 14, 15 as shown in Figs. 3 and 4, said holding members being mounted swingably about a bolt 13. A stop 16 is provided on the pull rope 2 shortly above the

bucket 1. Said holding members 14, 15 will be moved apart when said stop 16 is moved upward by the pull rope 2. On further upward motion of the stop 16 on the pull rope 2 the former will hit against the arm 17 of a bell crank lever and disengage the hook or nose 11 from the stop 12 by way of the other arm 18 of said bell crank lever, the rod 19 and the lever 20, thus disengaging the pulley block 9 from the rope 8. The pulley block 9 now moves together with the bucket 1 suspended therefrom along the carrying rope 8 in upward direction towards the place of discharge.

On emptying of the bucket 1 the pulley block 9 together with the empty bucket suspended therefrom will again be pulled downward on the carrying rope 8 by means of the pull rope 3 which serves for the backward motion of the bucket 1. This backward motion of the bucket may evidently also be effected by means of a special rope provided for this purpose or also by action of the own weight of the pulley block 9 and the bucket 1. In order to prevent in this case the pulley block 9 against being prematurely disconnected from the bucket, a resilient lock 22 is provided at the under part of said pulley block. The lock 22, however, will release the stop 16 on the pull rope 2 by action of the rope 3, as soon as the pulley block has again engaged with the stop 11 on the rope 8 or when the pull rope has been braked by the winch 7. Now the bucket is still drawn backward a short distance on the ground as far as to the starting point for the operation of dredging.

Emptying of the dredging bucket proper is effected at the place 21 at which the material is discharged from the bucket by means of a stop lever 23 or the like provided at said place. This stop lever will lift a closing and clamping roller 24 or the like from the drop-door 25 of the bucket 1 so that said door may be opened. By pulling the bucket backward the latter will again assume its horizontal position in which position the drop-door at the bottom of the bucket will again be closed by action of its own weight, the roller 24 now again locking said drop-door.

The device which forms part of my invention is connected with a number of advantages as compared with known devices of this kind. In the first place an advantage consists therein that my new device requires only a small amount of power for being operated, this being due to the fact that the working stroke of the bucket is only of such a length as is required to fill the bucket with the material to be removed by dredging. Backward motion, that is the idle stroke of the bucket, is carried on for the greatest part in freely suspended condition of the bucket above the ground so that the total path of motion of the bucket will be free of friction on the ground and in particular there will be no impediment due to material accumulating in front of the bucket which is the case with known devices of the present kind. In case of dredging under water furthermore the weight of the filled bucket will be diminished by the weight of the water which is displaced thereby. With the device forming part of my invention there is fur-

thermore no need of having the bucket climb along slopes or the like. In consequence of this, the wear of the bucket as well as of the ropes will be greatly reduced. In connection with this it is also of especial importance that all moving parts are outside of the material to be removed by dredging. My new device also is essentially superior to known devices of this kind, inasmuch as the bucket may be moved with far greater velocity as is possible with known devices. In addition to this, with the device forming part of my invention there will be no difficulties in connection with work that has to be done at slopes, such as filling up scored or underwashed places; furthermore, by my invention there will be avoided any kind of undesirable backward dredging which is the case when sliding the bucket along the ground as is done in known constructions. My new device is especially well adapted for dredging at great depth under water. The costs of construction and maintenance of the device according to my invention are relatively small as compared with the costs of known constructions.

A further advantage of my invention consists therein that the device for dredging may easily be applied in every case and will permit the greatest possible utilisation of the ground. My new construction will also dispense with the high mast which is necessary with the known constructions of cable buckets or cable dredges in which the bucket is carried back by action of its own weight. By my invention it will be possible to attain practically unlimited widths over which the rope which serves for carrying back the bucket may be retracted. The carrying cable furthermore does not need to be anchored on the opposite side of the water surface, as according to my invention it will also be possible to use a short carrying cable which may be fixed at its other end at a point of support positioned at a definite distance from the slope.

Finally, the device forming part of my invention has the further advantage that it can be operated from all directions radially with respect to the adjustable pulley block 9. For this purpose it will only be necessary to properly displace the deflecting rollers around which the rope for pulling back the bucket is carried.

My new dredging device may also be mounted as a whole on a vehicle which floats on the water or on a vehicle on the ground.

In addition to this, my new construction of dredger will also permit to perform the operation of dredging not only in direction towards the mast but also in direction away from the latter by fixing the stop 12 on the carrying cable 8 at some greater distance from the mast. In this case it will only be necessary to provide a device for carrying back the pulley block 9 towards the stop 12. Eventually such carrying back of the pulley block may also be effected by action of gravity. It will further be possible to provide a third winch with a rope or also a counterpoise with a rope by means of which the pulley block may be carried back towards the stop 12.

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