Dec. 19, 1961 J. A. GAYLORD 3,013,395

RIVER BOTTOM SAND ACCUMULATION REMOVER

Filed July 28, 1959 2 Sheets-Sheet 1

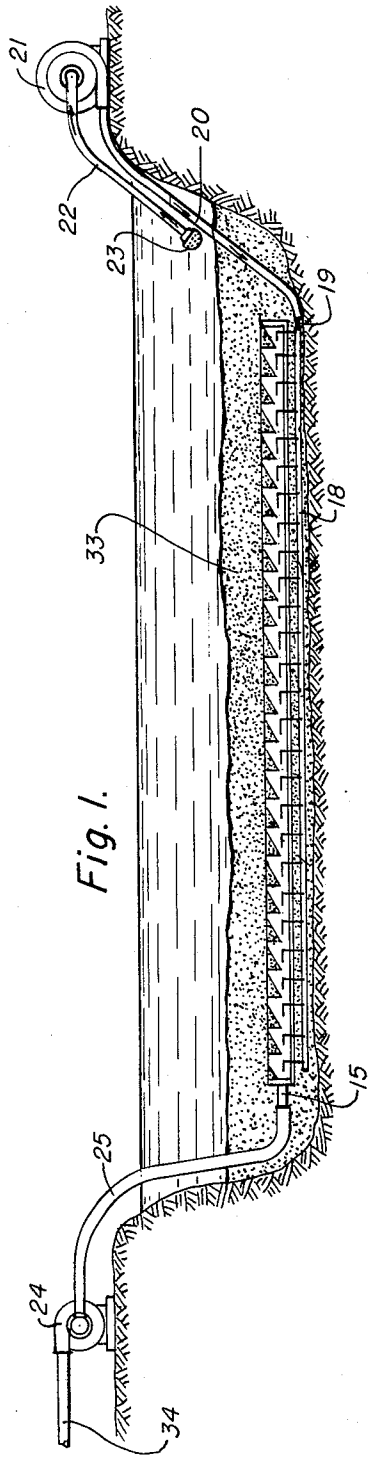



Fig. 1.

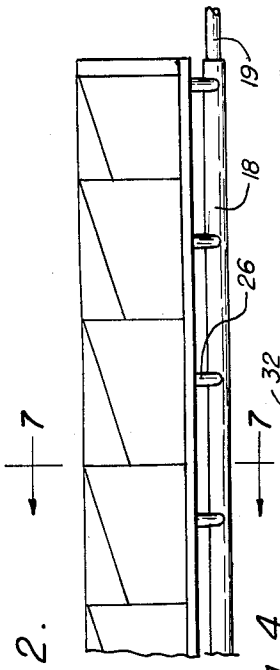
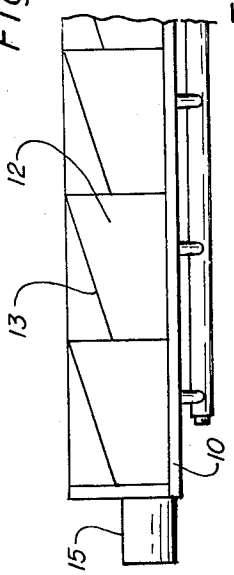



Fig. 2.



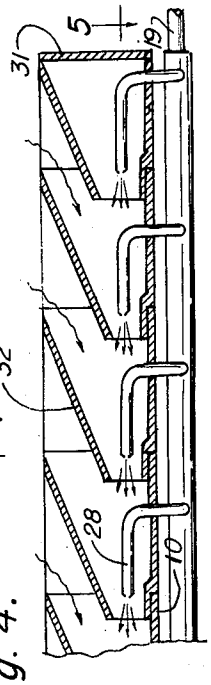
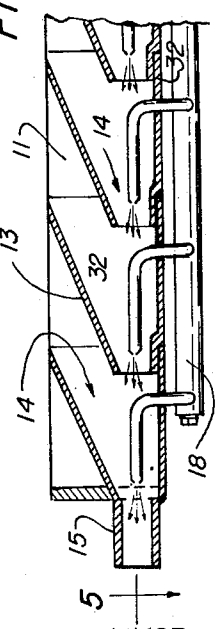




Fig. 4.

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Dec. 19, 1961 J. A. GAYLORD 3,013,395

RIVER BOTTOM SAND ACCUMULATION REMOVER

Filed July 28, 1959 2 Sheets-Sheet 2

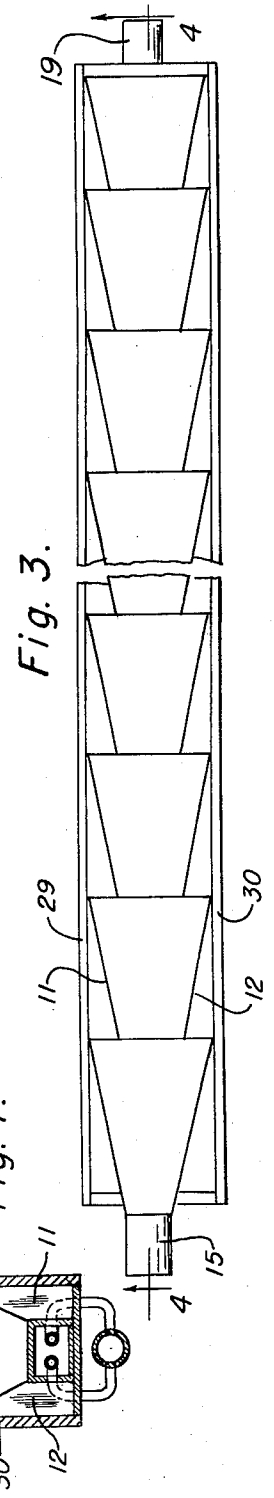


Fig. 3.

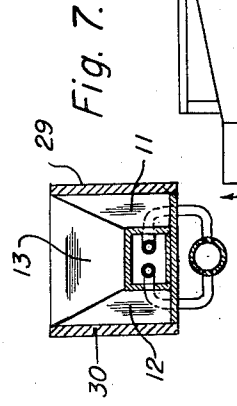


Fig. 7.

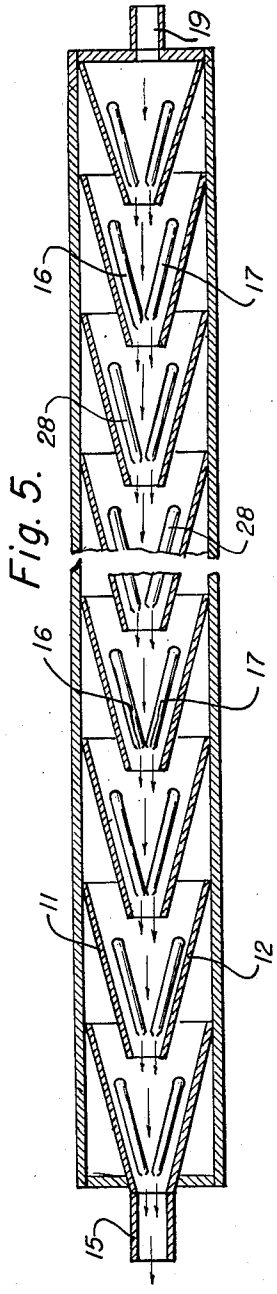


Fig. 5.

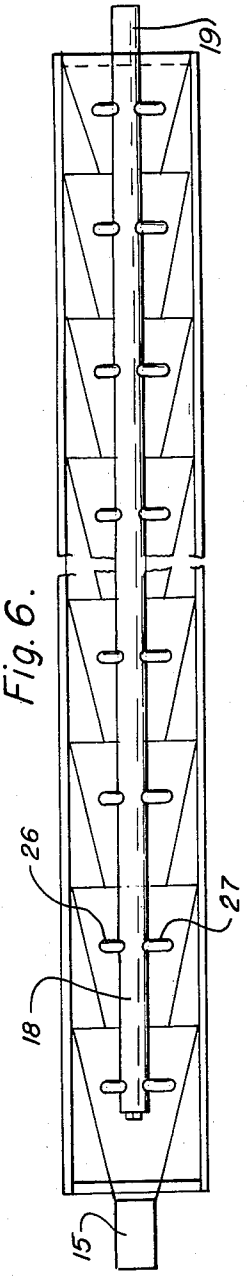


Fig. 6.

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# 3,013,395
# RIVER BOTTOM SAND ACCUMULATION REMOVER

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3 Claims. (Cl. 61—2)

This invention relates to dredging and other methods for removing sand bars, deltas, and other accumulations of materials on river bottoms, inlets, and the like, and in particular an elongated structure having spaced converging baffles providing open cells extended across a river bed with a fluid injecting pump at one side of the river for forcing fluid through jets in openings at one of the ends of cells and with a suction pump on the opposite side of the river for drawing sand and other materials from the baffles or cells.

The purpose of this invention is to provide a sand remover that may readily be positioned in a sand accumulation at the bottom of a river and that is designed to be operated with jet action to remove the sand from the river bed and deposit the said on a bank at one side of the river.

Various types of dredging equipment have been provided for removing accumulations of material on river beds are the like and some of such equipment operates by suction or with jet action. However, for efficient operation of such equipment it has been found desirable to provide sand arresting pockets or cells with fluid discharged through nozzles under pressure for withdrawing sand from said cells and with suction means for receiving the sand and also conveying the sand to a remote point. With this thought in mind this invention contemplates an elongated open casing having a plurality of cells therein with fluid discharging nozzles positioned to create suction in the cells and with one pump for supplying fluid under pressure to the nozzles, and another pump for creating suction around the nozzles to facilitate withdrawing sand from the cells.

The object of this invention is, therefore, to provide an elongated trough with transversely disposed partitions providing cells therein, with a pump at one end for discharging fluid under pressure and with a jet action through ends of the cells and with a pump at the opposite end for drawing fluid from the ends of the cells in which the jet action nozzles are positioned.

Another object of the invention is to provide a sand remover for river and bay bottoms in which the remover is designed to be assembled at the side of a river or bay and readily dropped into position with pumps connected to opposite ends thereof.

Another important object of the invention is to provide a river bottom accumulation remover which is designed to be used for other purposes.

A further object of the invention is to provide a river bottom sand accumulation remover having a pressure pump at one end and a suction pump at the opposite end in which the remover is of a simple and economical construction.

With these and other objects and advantages in view the invention embodies an elongated trough having spaced transversely disposed partitions therein dividing the trough into cells with a pressure header extended below the trough and having branch connections with discharge nozzles at ends thereof extended upwardly and into the cells and with a pressure pump connected to the header and a suction pump connected to the opposite end of the trough.

Other features and advantages of the invention will appear from the following description taken in connection with the drawings, wherein:



FIGURE 1 is a cross-section through a river bed showing a side-elevational view of the river bottom sand removing apparatus.

FIGURE 2 is a side-elevational view of the trough of the apparatus with part of the trough broken away and with the parts shown on an enlarged scale.

FIGURE 3 is a plan view of the trough showing the converging baffles in the sides of the cells.

FIGURE 4 is a longitudinal section through the trough taken on line 4—4 of FIGURE 3 showing the jet action nozzles positioned in throats of the cells and also showing a suction connection at the discharge end of the trough.

FIGURE 5 is a sectional plan taken on line 5—5 of FIGURE 4 showing the converging walls or baffles of the cells and also showing the jet action nozzles in the small ends of the cells.

FIGURE 6 is a view looking upwardly toward the under side of the trough showing the fluid pressure header with the branch connections of the nozzles positioned in the cells.

FIGURE 7 is a cross-section through the trough taken on line 7—7 of FIGURE 2.

Referring now to the drawings wherein like reference characters denote corresponding parts the improved river bottom accumulation remover of this invention includes an elongated trough having a base **10**, a plurality of converging baffles having inclined side walls **11** and **12** and sloping cover panels **13** mounted on the base and positioned with throats **14** thereof aligned with a discharge nipple **15**, pairs of nozzles **16** and **17** positioned in the baffles, a supply header **18** having a nipple **19** connected by a hose **20** through a pressure pump **21**, the intake of which is connected by a hose **22** to a perforated head **23**, and a suction pump **24** connected by a hose **25** to the discharge nipple **15** of the trough.

The length of the trough is such that the trough extends from one side of a river bed to the other and the number and size of the baffles is depended upon the size of the river.

As illustrated in FIGURES 6 and 7 the header **18** is provided with branch connections **26** and **27** that extend upwardly through the base **10** and, as illustrated in FIGURES 4 and 5 upper sections **28** of the branch connections extend toward the discharge end of the trough and the ends of the sections **28** are formed to provide the nozzles **16** and **17**.

The trough is provided with side walls **29** and **30** from which the inclined side walls **11** and **12** of the baffles extend and the intake end of the trough may be provided with an end plate **31**, as shown in FIGURE 4.

Also as shown in FIGURE 4, the trough may be formed in sections, with sections **32** of the base extended upwardly overlapping adjoining ends of the base portions of the sections.

With the units assembled to form a trough, as illustrated in FIGURE 1, the intake nipple **19** of the fluid pressure supply header **18** is connected by the hose **20** to the pump **21** and the discharge nipple **15** is connected by hose **25** to the suction side of the pump **24** whereby the discharge of fluid under pressure through the nozzles **16** and **17** is accentuated by the fact that the nozzles are discharging into vacuum or suction whereby a jet action is produced so that sand sliding down the cover panels **13** drops into a suction area and is discharged through the hose **25** and pump **24**. By this means, sand, as indicated by the numeral **33**, in FIGURE 1 is removed by jet action from a river bed and deposited on the bank at the side of a river bed. The discharge of the pump **24** may be provided with a tube **34** by which the sand may be carried to a suitable point.

Although the trough is provided with pairs of jets or nozzles it will be understood that any suitable number of nozzles may be used and the baffle units may also be arranged in different designs.

It will be understood that modifications, within the scope of the appended claims, may be made in the design and arrangement of the parts without departing from the spirit of the invention.

What is claimed is:

1. A jet action sand remover comprising an elongated trough, aligned baffles comprising chambers having converging side and upper walls positioned in the trough, said baffles being spaced along the length of said trough with the small ends of said baffles all extending in the same direction, so that the small end of each baffle is adjacent the larger end of a succeeding baffle, aligned nozzles providing jets in small ends of the baffles, a header extended longitudinally of the trough, branch connections extended from the header to the nozzles, a pump positioned with the discharge thereof connected to the header at one end of the trough, and a pump positioned with the suction thereof connected to the end of the trough opposite to the end at which the header is connected to a pump, and at a point aligned with the nozzles and small ends of the baffles.

2. In a river bottom accumulation remover, the combination which comprises an elongated trough, baffles comprising chambers having converging side walls and upper walls positioned in the trough, said baffles being spaced along the length of said trough with the small ends of said baffles all extending in the same direction, so that the small end of each baffle is adjacent the larger end of a succeeding baffle, pairs of nozzles positioned in small ends of the baffles, the last baffle having a nipple extended from one small end thereof and said nipple being aligned with the pairs of nozzles and small ends of



the other baffles, a pump arranged with the suction side thereof connected to said nipple, a fluid pressure header extended longitudinally of the trough, branch connections from said header to the pairs of nozzles, and a pump arranged with the discharge side thereof connected to said header.

3. In a river bed sand accumulation remover, the combination which comprises an elongated trough designed to be positioned in a river bed, baffles comprising chambers having converging side walls and upper walls positioned in the trough, said baffles being spaced along the length of said trough with the small ends of said baffles all extending in the same direction, so that the small end of each baffle is adjacent the larger end of a succeeding baffle, one of said baffles having a nipple extended therefrom and said nipple being aligned with small ends of the baffles, pairs of nozzles in the small ends of the baffles and positioned to discharge toward said nipple, a suction pump arranged with the suction side thereof connected to said nipple, a header positioned below the trough, branch connections extended from sides of the header and connected to the nozzles, and a pressure pump arranged with the discharge side thereof connected to said header.

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