United States Patent [19]

Good

BEST AVAILABLE COPY

[11] **3,910,837**

[45] **Oct. 7, 1975**

[54] **PORTABLE PLACER MINING APPARATUS**

[76] Inventor: **Elmer J. Good,** 14295 El Capitan, Delhi, Calif. 95315

[22] Filed: **Dec. 19, 1973**

[21] Appl. No.: **426,073**

[52] **U.S. Cl.** **209/461;** 209/488; 209/500; 209/506; 299/9; 37/57

[51] **Int. Cl.²** **B03B 5/02**

[58] **Field of Search** ..... 209/461, 155, 497, 500, 209/506, 488, 458, 460; 134/25 R; 299/7, 9

[56] **References Cited**

UNITED STATES PATENTS

727,974	5/1903	Klein	209/461 X
912,766	2/1909	Wood	209/458 X
1,129,351	2/1915	Lake	209/458 X
1,458,234	6/1923	Miller	209/461 X
3,161,438	12/1964	Novak	209/458 X

Primary Examiner—Frank W. Lutter
Assistant Examiner—Ralph J. Hill
Attorney, Agent, or Firm—Clarence A. O'Brien; Harvey B. Jacobson

[57] **ABSTRACT**

A placer mining apparatus is provided and includes a sluice box having riffle bars therein and a water and gravel inlet at one end provided with an adjustable control gate. The other end of the sluice box includes pressurized water inlet nozzles for creating back pressure to the flow of water and gravel entering through the inlet and the end of the sluice box into which the inlet opens is also provided with a removable cover plate for which a downwardly opening hopper box may be substituted. Also, a floatable motor driven pump is provided and includes an outlet connected to the inlet of the sluice box and an inlet having a flexible hose secured thereto at one end, the other inlet end of the hose being provided with a suction bit. There is also provided an upstanding container having an upper inlet to which the outlet of the motorized pump may be connected in lieu of the inlet for the sluice box and the container includes a grizzly screen mounted transversely therein below the inlet of the container.

4 Claims, 8 Drawing Figures

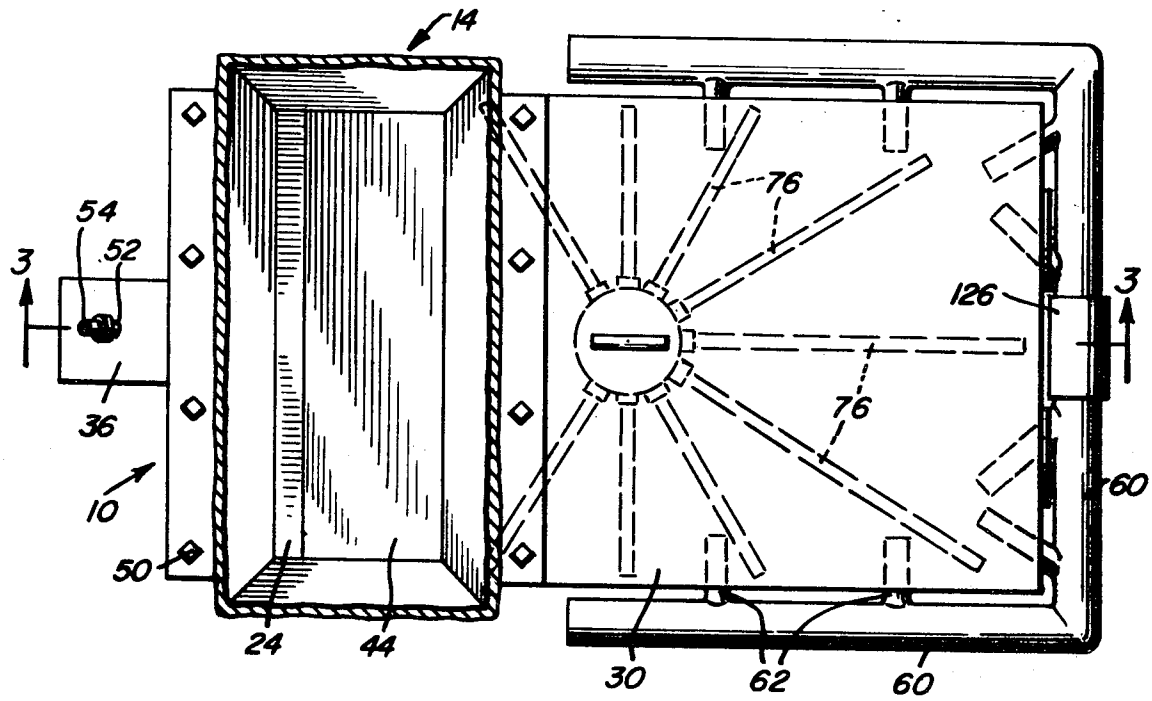


Fig. 1

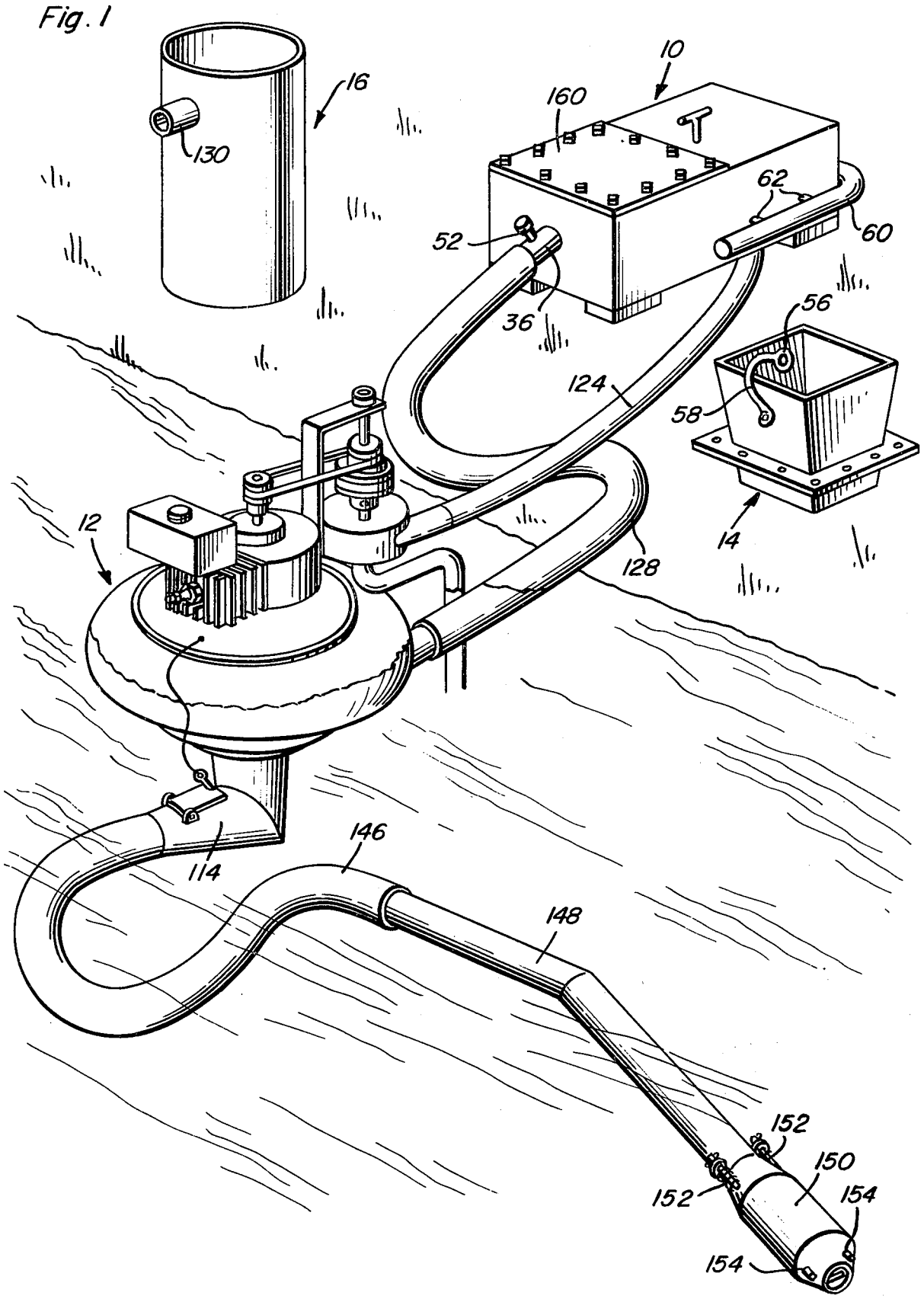

16
130
10
160
62
60
52
36
56
58
124
14
12
128
146
114
148
152
150
154
152
154

Fig . 2

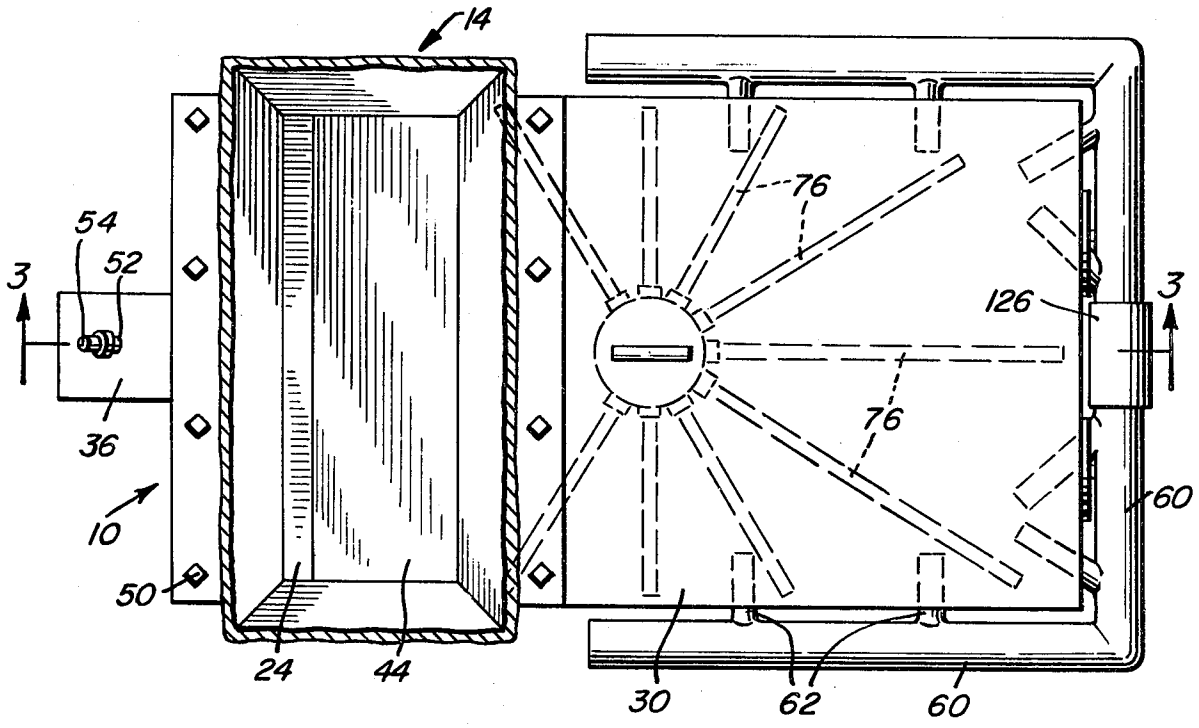


Fig . 3

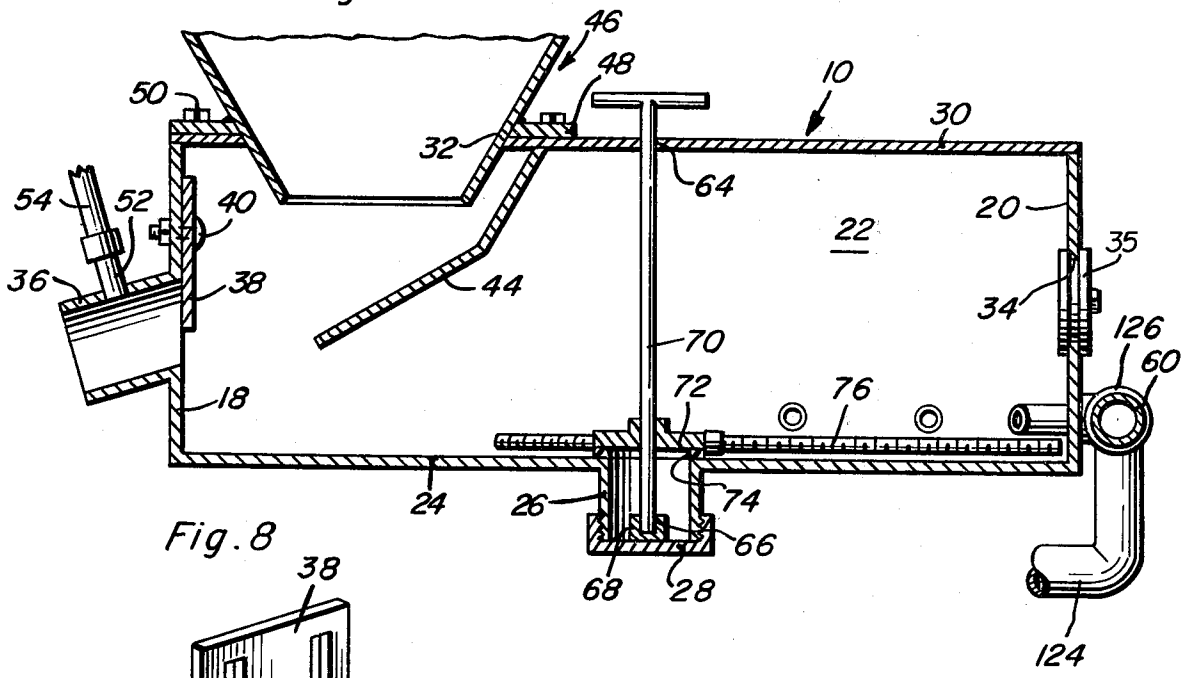


Fig . 8

Fig. 4

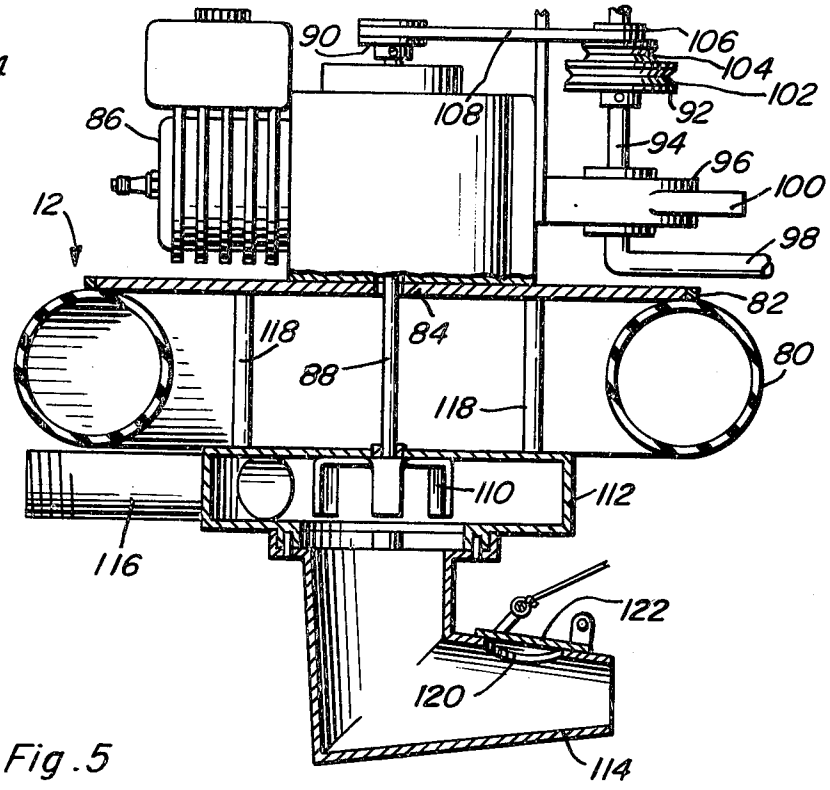


Fig. 5

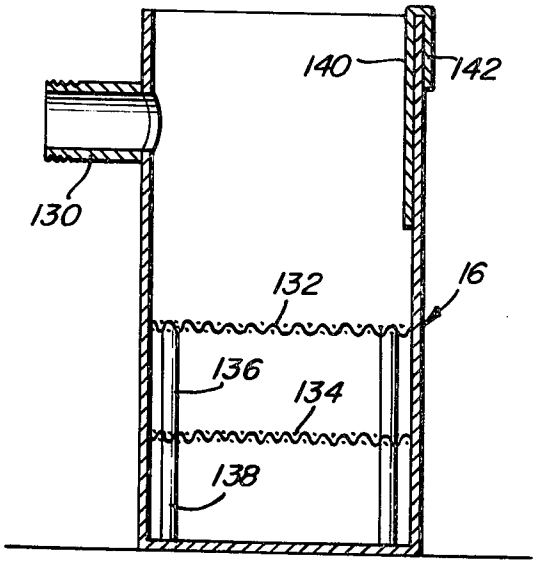


Fig. 7

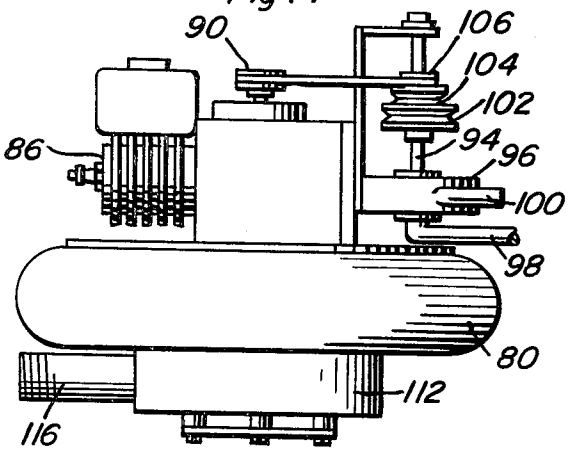
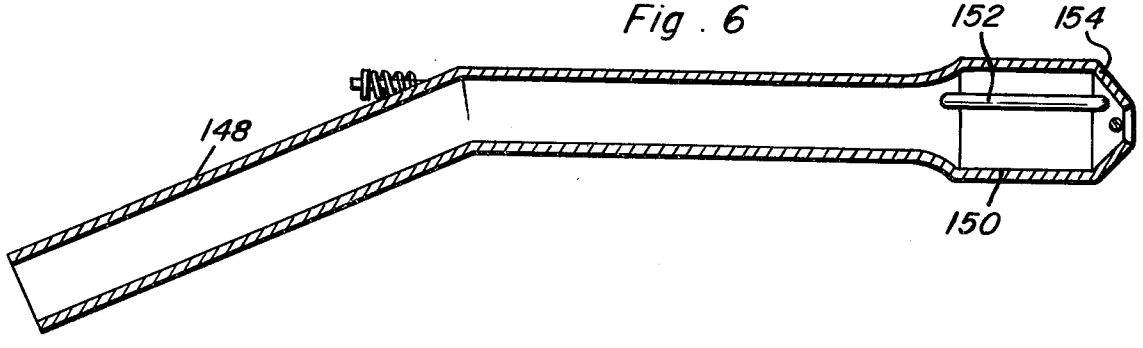


Fig. 6



PORTABLE PLACER MINING APPARATUS

The portable placer mining apparatus of the instant invention has been designed to provide equipment which may be readily utilized for various types of placer mining operations. The apparatus includes several components which may be readily packed to remote locations and which may be handled, if necessary, by one man.

The main object of this invention is to provide a placer mining apparatus including various components which may be utilized in different combinations for carrying out different placer mining operations.

Another object of this invention is to provide a placer mining apparatus including a plurality of components which are each capable of being packed to remote locations.

Another object of this invention is to provide a portable placer mining apparatus which may be utilized in placer mining for various materials including gem stones and heavier metal ores.

A final object of this invention to be specifically enumerated herein is to provide a portable placer mining apparatus in accordance with the preceding objects which will conform to conventional forms of manufacture, be of simple construction and easy to use so as to provide a device that will be economically feasible, long lasting and relatively trouble free in operation.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout.

FIG. 1 is a perspective view illustrating the various individual components of the placer mining apparatus, which components include a floating motorized pump, a sluice box with a removable cover and a hopper box for use as a substitute for the sluice box cover as well as an upstanding container having an upper inlet and a lower transverse grizzly screen disposed therein;

FIG. 2 is a top plan view of the sluice box with the closure cover thereof removed and the hopper box secured in place of the closure cover;

FIG. 3 is a fragmentary vertical sectional view taken substantially upon the plane indicated by the section line 3—3 of FIG. 2;

FIG. 4 is an enlarged vertical sectional view taken substantially upon a plane passing through the center of the motorized floating pump unit;

FIG. 5 is an enlarged vertical sectional view taken substantially upon a plane passing through the center of the upright container;

FIG. 6 is an enlarged longitudinal vertical sectional view taken substantially upon a plane passing through the longitudinal center of the suction nozzle;

FIG. 7 is a side elevational view of the floating motorized pump unit with the inlet nozzle thereof removed; and

FIG. 8 is an enlarged perspective view of the adjustable flow gate utilized to control the flow of water through the inlet for the sluice box.

Referring now more specifically to the drawings, the portable placer mining apparatus is illustrated in FIG. 1 and includes a sluice box referred to in general by the reference numeral **10**, a floating motorized pump assembly referred to in general by the reference numeral **12**, a hopper box assembly referred to in general by the reference numeral **14** and an upstanding container referred to in general by the reference numeral **16**. With attention now invited more specifically to FIGS. **2** and **3** of the drawings it may be seen that the sluice box **10** includes a pair of opposite end walls **18** and **20** as well as a pair of opposite side walls **22**. The lower marginal edge portions of the end walls **18** and **20** and the side walls **22** are interconnected by means of a bottom wall **24** having a central depending outlet neck **26** closed by means of a removable cap **28** threadedly engaged with the exterior of the lower end of the outlet neck **26**. The top of the sluice box **10** includes a top wall **30** having an opening **32** in one end thereof. Also, the end wall **20** includes a pair of outlet openings **34** spaced above the bottom wall **24** and the end wall **18** includes an inlet neck **36** opening therethrough above the bottom wall **24**. Each opening **34** is provided with a removable closure **35** therefor.

A slotted flow controlling gate **38** is provided and a pair of carriage bolts **40** are secured through the slots **42** formed in the gate **38** and the end wall **18** above the inlet **36** and are utilized to releasably secure the flow control gate **38** in adjusted position. Also, the interior of the sluice box **10** includes an angled baffle plate **44** which extends between the side walls **22** and downwardly from the top wall **30** beneath the opening **32** and toward the inlet **36**.

An open top hopper box referred to in general by the reference numeral **14** is provided and includes peripherally extending lower marginal mounting flanges **48** which are secured to the top wall **30** by means of bolts **50** about the opening **32** in which the open lower end of the hopper box **14** is seatingly received.

The inlet **36** includes a liquid by-pass neck **52** opening outwardly of the inlet neck **36** on the exterior of the sluice box and a flexible hose **54** has its inlet end secured to the outlet end of the neck **52** and its outlet end releasably supportable from a support ring **56** carried by the upper end of the support bracket **58** secured to the hopper box **14**.

A generally U-shaped pressure manifold **60** is horizontally disposed and embraces the end of the sluice box **10** remote from the inlet neck **36**. Longitudinally spaced portions of the pressure manifold include nozzle outlets **62** which open through the end wall **34** and adjacent portions of the side walls **22** into the lower portion of the interior for the sluice box **10**. Also, the top wall **30** of the sluice box **10** includes a small diameter opening **64** in vertical registry with an upwardly opening blind bore **66** formed in a fitting **68** secured to the center of the cap **28** and a support rod **70** is slidably and rotatably received through the opening **64** and has its lower end slidably and rotatably received in the blind bore **66**. A lower portion of the support rod **70** includes an annular mounting plate **72** through which the rod **70** extends and the undersurface of the outer periphery of the mounting plate **72** is provided with an annular seal member **74** engaged with the upper surface of the bottom wall **24** about the upper end of the outlet neck **26**. The mounting plate **72** includes generally radially outwardly extending riffle bars **76** which closely overlie but are spaced from the bottom wall **24**.

With attention now invited more specifically to FIG. **4** of the drawings, it may be seen that the floating motor driven pump assembly **12** includes an annular inflated float member **80** on which there is supported a circular

mounting plate **82** having a central opening **84** formed therethrough. A gasoline motor **86** including a vertical output shaft **88** is mounted on the plate **82** and the upper end of the output shaft **88** includes a pulley **90** horizontally aligned with a three groove pulley **92** carried by the upstanding rotary input shaft **94** of a high pressure pump **96** including an inlet **98** and an outlet **100.**

The three groove pulley is vertically adjustable on the shaft **94** and accordingly, each of the grooves **102, 104** and **106** may be aligned with the pulley **90.** In FIG. **4** of the drawings the groove **106** is in line with the pulley **90** and an endless flexible belt **108** drivingly connects the pulley **90** to the pulley **92.** The lower end of the output shaft **88** extends downwardly through the opening or bore **84** and has an impeller **110** of a larger capacity pump **112** mounted thereon. The pump **112** includes a rotatable inlet neck **114** and an outlet neck **116** and the pump **112** is supported from the plate or panel **82** by means of a plurality of depending supports **118** carried by the plate **82.** Also, the inlet neck **114** includes an opening **120** formed therein provided with a swingable closure **122** which may be opened so as to prime the pump **112** which is disposed below the level of water on which the annular float **80** is disposed and restore suction.

The inlet **98** of the pump **96** extends downwardly into the water illustrated in FIG. **1** of the drawings and the outlet **100** of the pump **96** is connected by means of a flexible hose **124** to the inlet fitting **126** of the pressure manifold **60.** Also, a flexible hose **128** connects the outlet **116** of the pump **112** to the inlet **36** of the sluice box **10.**

The upstanding container **16** includes an inlet neck **130** opening through an upper side wall portion thereof to which the outlet neck of the flexible hose **128** may be connected in lieu of the inlet **36** of the sluice box **10.** In addition, the interior of the container **16** includes a pair of vertically spaced grizzly screens **132** and **134** provided with support legs **136** and **138,** respectively. Still further, the side wall of the container **16** remote from the inlet neck **130** is provided with a readily removable abutment plate **140** whose upper end is bent outwardly and downwardly as at **142** for ready support from the upper marginal edge portion of the container **16.**

A flexible inlet hose **146** is provided and the outlet end of the hose **146** is connected to the inlet **114.** The inlet end of the hose **146** is connected to the outlet end **148** of a vacuum nozzle **149** whose inlet end is somewhat diametrically enlarged as at **150** and includes a pair of internal longitudinally reciprocal and spring retracted rock ejection rods **152,** a pair of opposite side inlet openings **154** being formed in the inlet end of the vacuum nozzle to slidingly received the rods **152.**

In operation, when it is desired to draw pebbles and silt from the bottom of a stream bed the floating motorized pump assembly **12** is floated on the stream and the suction nozzle is utilized to draw the pebbles and silt from the bottom of the stream upon operation of the motor **86.** The water, pebbles and silt drawn from the bottom of the stream are discharged from the pump **112** through the holes **128** and into the sluice box through the inlet **36.** At the same time, the discharge from the pump **96** is conveyed to the pressure manifold **60** through the hose **124** and jets of water are discharged from the nozzles **62** toward the end of the sluice box **10** into which the discharge from the pump **112** is delivered. If a person is mining for gemstones, the groove **106** of the pulley **92** is aligned with the pulley **90.** However, if heavier materials are being mined either the groove **102** or the groove **104** is aligned with the pulley **90** so that the discharge of water from the nozzles **62** will be less and there will be less resistance to the ingress of water through the inlet **36.**

In addition, the discharge from the hose **128** may be directed to the inlet neck **130** of the container **16** so that heavier stones and pebbles may be caught by the grizzly screens **132** and **134.** Also, it is to be understood that the flow gate **38** will not be used when the cover plate **160** illustrated in FIG. **1** is used in lieu of the hopper box **14.** However, when the cover **160** is removed and the hopper box **14** is mounted on the top wall **30** in lieu of the cover **160,** the flow control gate **38** is used.

Of course, the rods **152** may be actuated to dislodge any large rocks that become wedged in the openings **154** and it is to be noted that the swingable closure **122** for the opening **120** may be temporarily swung to the open position whenever it is necessary to restore vacuum.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention.

What is claimed as new is as follows:

1. A portable placer mining apparatus including a sluice box having a generally flat bottom and upstanding peripheral walls, an inlet for water under pressure opening through one upstanding wall of the box toward the remote marginal portion of the box, said remote marginal portion including a water outlet formed in the corresponding upstanding wall elevated above the bottom wall of the box, generally horizontal and radially arranged riffle rods spaced about and extending outward from a central zone of said box intermediate said inlet and outlet and spaced slightly above said bottom wall and, a plurality of water jet outlets spaced about the periphery of said remote marginal portion of said box, said water jet outlets being disposed to direct generally horizontal jets of water therefrom inwardly at an elevation above said rods and towards a central area of said box disposed to the side of said central zone toward said remote marginal portion.

2. The combination of claim **1** including a center support for said riffle rods supported within said box for vertical shifting therein.

3. The combination of claim **1** wherein said bottom wall includes a removably closable outlet opening therein beneath said central zone.

4. The combination of claim **3** including a central support for said riffle rods supported within said box for vertical shifting therein.

* * * * *