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COLLAPSIBLE DUMP BAILER

Filed Sept. 12, 1960

FIG. 1.

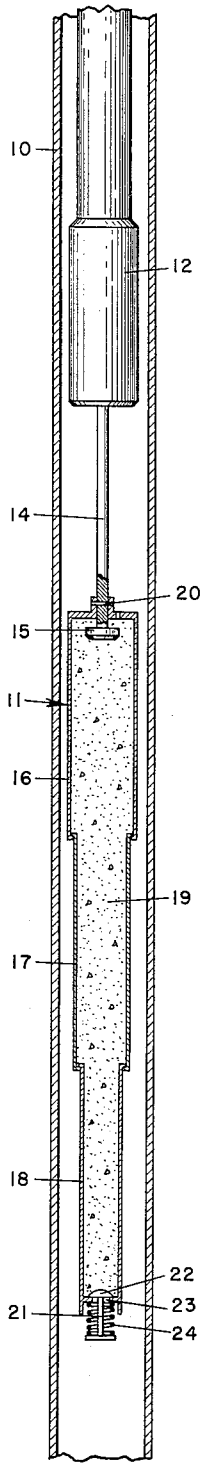


FIG. 2.

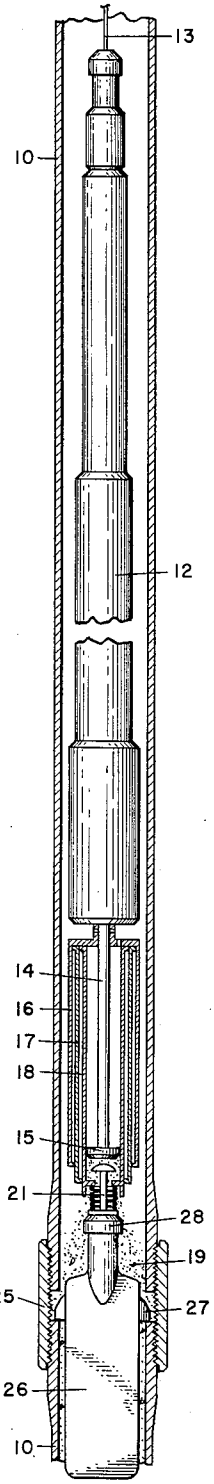


FIG. 3.

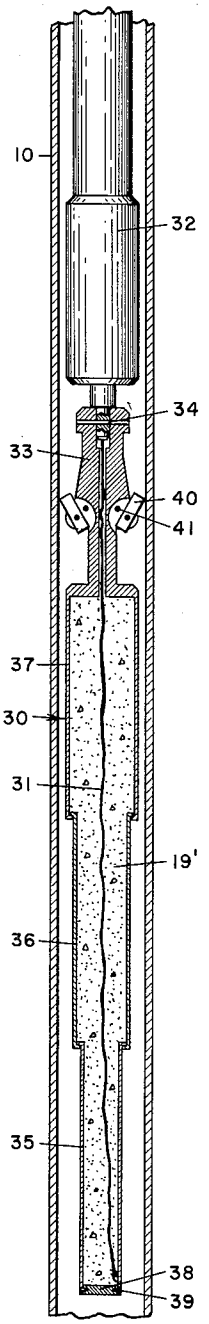
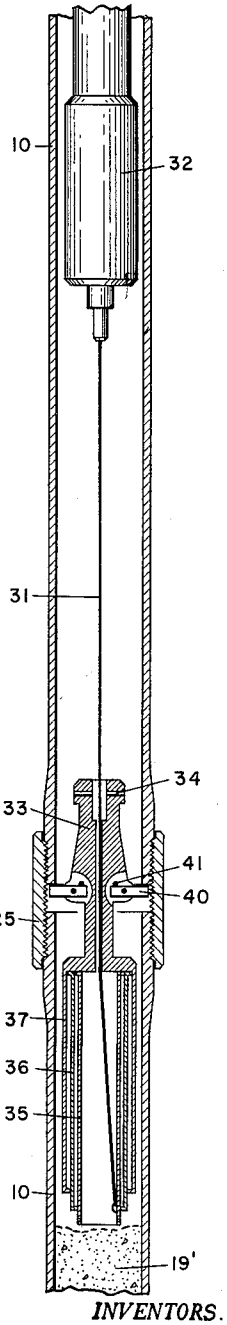


FIG. 4.



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COLLAPSIBLE DUMP BAILER

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The present invention concerns a dump bailer for use in wells which collapses and expels its content and which is suspendible and run in the well borehole on a solid, nonconducting wireline.

Wireline run dump bailers that discharge their contents by gravity are available, but it is often difficult to dump their contents completely when a viscous fluid is carried; cement carried in this type dump bailer often is impossible to dump because partial dehydration takes place while the bailer is being lowered in the well. To overcome these difficulties in the use of gravity-type dump bailers, attempts have been made to forcibly dispel the contents; e.g., an explosive charge has been used to discharge the bailer. However, this arrangement has disadvantages, because an electrical conductor cable is needed to supply electricity to cause the explosive charge to fire.

A primary purpose of the present invention is to provide a dump bailer that forcibly expels its contents and which can be run in the well on a nonconducting type wireline.

Briefly, the invention comprises a plurality of extensible, collapsible, telescopic members adapted to initially provide chambers to contain material it is desired to place at a preselected position in a well; means arranged on the end of the lowermost member adapted to initially retain the expellable material in the chambers; and means for releasing the material-retaining means to permit the material to be forcibly expelled from the chambers.

The above object and other objects of the invention will be apparent from a more detailed description of the invention taken in conjunction with the drawings wherein:

FIG. 1 is a cross-sectional view of a portion of a well tubing and shows one form of the dump bailer in running-in position;

FIG. 2 is a view similar to that shown in FIG. 1 and illustrating the dump bailer of FIG. 1 in collapsed condition;

FIG. 3 is a cross-sectional view of a portion of a well tubing and shows another embodiment of the dump bailer in running-in position; and

FIG. 4 is a view similar to that shown in FIG. 3 illustrating the dump bailer in collapsed condition.

For a more complete description of the invention, reference to the figures in greater detail will now be made. In FIGS. 1 and 2 is shown a well pipe **10** in which is arranged a dump bailer generally designated **11**, which includes a wireline tool section **12** suspended on a solid, nonconducting wireline **13**. A stem or rod **14** is connected to and extends from the lower end of wireline tool **12**. The lower end of stem **14**, provided with a plunger or piston member **15**, is positioned within the uppermost member **16** of a plurality of extensible, collapsible, telescopic members **16**, **17**, and **18**, which in the extended position, as seen in FIG. 1, provide chambers for the retention of material, such as cement **19**, to be dumped in the well. Stem **14** is initially affixed releasably to the uppermost telescopic member **16** by means of a shear pin **20**. The lowermost telescopic member **18** is provided at its lower end with a check valve **21**, which includes a closure element **22** for closing off an opening **23** formed in the lower end of telescopic member **18** and a spring

24 adapted to urge the closure element **22** to closed position.

In FIG. 2 is shown a pipe collar **25** interconnecting two sections of pipe string **10** and a conventional collar stop apparatus **26**, which includes dogs **27** for engaging the recess in collar **25**, and an upper stop lug **28**, which engages the lower end of check valve **21**.

In the operation of this embodiment of the invention, when it is desired to spot material in pipe string **10** along the length thereof or at the bottom thereof, dump bailer **11** in extended position, as seen in FIG. 1 is lowered in pipe string **10** on wireline **13**. Check valve **21** retains the cement or other material **19** in the chambers of the telescopic members, sections **16**, **17**, and **18** during running-in, the spring **24** being just strong enough to keep closure element **22** in position to keep opening **23** closed. If it is desired to dump the contents on the bottom of the hole, the tool may be run to the bottom and collapsed. As illustrated in FIG. 2, if it is desired to dump the cement somewhere along the length of pipe string **10**, then collar stop apparatus **26** is run in pipe string **10** first, and dogs **27** are latched in the pipe collar at the depth it is desired to dump the contents of the dump bailer. In the event it is desired to dump the contents of the bailer somewhere close to the bottom of the hole a bar in place of collar stop apparatus **26** may first be dropped in pipe string **10**, the upper end of which would engage the lower end of check valve **21** to permit the tool to collapse and dump. In any event, whether the bottom of the hole, lug **28**, or a bar is used to force open closure member **22** against the bias of spring **24**, the members **16**, **17**, and **18** are collapsed, and cement **19** is forcibly expelled from the chambers formed by these members by raising up and jarring down of the tool **12** by means of wireline **13**. Jarring down on tool **12** also causes shear pin **20** to shear, which releases the connection between stem **14** and upper members **16** and permits plunger **15** to force the last of the cement contained in the chamber formed by member **18** from this member, as clearly illustrated in FIG. 2. To remove the dump bailer from pipe string **10**, it is only necessary to pick up on wireline **13**, for all of the parts are interconnected, stem **14** being connected to the telescopic members through plunger **15**.

In the operation of the embodiment of the invention shown in FIGS. 1 and 2, telescopic members **16** to **18** are collapsed from top to bottom. In the embodiment of the dump bailer shown in FIGS. 3 and 4, telescopic sections containing cement are collapsed from bottom to top. This dump bailer, generally designated **30**, is suspended in well pipe **10** on a wireline **31** and on a shear pin **34**, mounted in an anchoring section **33**. Wireline **31** is suspended from a wireline tool string **32**, which in turn is connected to a wireline (not shown). Thus, as seen in FIG. 3, wireline **31** extends from wireline tool string **32** through anchoring section **33**, to which it is pinned by shear pin **34** to the lower end of the lowermost member **35** of a plurality of telescoping, extensible, retractable members **35**, **36**, and **37**. Wireline **31** is not in tension when dump bailer **30** is in the running-in position as shown in FIG. 3. The telescopic members **35**, **36**, and **37**, when extended, provide chambers for the material, such as cement **19'**, to be dumped. The lowermost end of member **35** is closed by a retainer disc **38**, which may be aluminum, and which is connected by means of a shear pin connection **39**, to member **35**.

The anchoring section **33** includes a plurality of pivotal dogs **40** adapted to lodge in the recess of a pipe collar **25** interconnecting sections of pipe string **10**. The inner ends of dogs **40** are restrained from moving upwardly by shear pin **41**. Thus, the dogs do not prevent downward movement of the bailer, but prevent upward movement

of the bailer once dogs **40** latch in a recess of a pipe collar until shear pins **41** are sheared upon application of sufficient upward force.

In the operation of the embodiment of FIGS. 3 and 4, dump bailer **30** is run in tubing string **10** on wireline **31** and on wireline tool string **32** (by means of shear pin **34**) until the depth is reached at which it is desired to dump cement **19'**. Then, wireline tool string **32** and dump bailer **30** are picked up until dogs **40** engage in the recess of collar **25**. Then, continued upward pull on wireline tool string **32** shears shear pin **34** interconnecting the tool string and anchoring section **33** and causes tension to be applied to the wireline **31**, which moves member **35** upwardly and causes shear pin **39** to fracture, which releases retainer disc **38**. Members **35**, **36**, and **37** then are forced into telescoped positions by continued upward movement of wireline **31**, and tool string **32** and cement **19'** is forcibly dumped from the chambers. If necessary, to dislodge cement **19'** members **35**, **36**, and **37** may be jarred by joggling wireline tool string **32** and wireline **31**.

When it is desired to remove this bailer, continued upward movement of wireline tool string **32** and wireline **31** causes shear pin **41** to shear to release anchoring dogs **40**.

Having fully described the elements, operation, and objects of our invention, we claim:

1. A dump bailer adapted to be lowered in a well bore on a wireline comprising a plurality of vertically extensible, collapsible, telescopically connected members forming chambers for initially containing material to be expelled therefrom and dumped in said well bore; releasable means arranged on the lower end of the lowermost telescopic member adapted to initially retain said expellable material in said chambers; and means for releasing said releasable material retaining means to permit said material to be expelled from at least all but one of said chambers upon collapse of said telescopic members.

2. Apparatus as recited in claim 1 wherein said means for releasing said releasable material retaining means includes a check valve adapted to open upon engagement with an obstruction in said well bore.

3. Apparatus as recited in claim 2 including a slidable stem initially connected to the uppermost of said telescopic members and extending into the chamber formed by the uppermost telescopic member, the lower interior end of said stem being provided with a plunger for aiding in expelling said material from all of said chambers upon collapse of said telescopic members.

4. Apparatus as recited in claim 1 wherein said releasable material retaining means includes a releasable disc arranged in the lower end of said lowermost telescopic member and wherein said means for releasing said material retaining means includes a wireline initially not in tension connected to the lower end of the lowermost telescopic member and first shear pin means releasably connecting said wireline to said uppermost telescopic member and anchoring means connected to said telescopic member adapted to prevent upward movement of said dump bailer in said well bore and second shear pin means releasably connecting said retainer disc to said lowermost telescopic member.

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