This invention relates to a tool employable in
the drilling of earth bores and more particularly to
a fishing tool for collecting and removing to
the surface all kinds of small objects that may
be at the bottom of an earth bore, such as an
oil well, the tool being commonly referred to as
a "junk basket."

One of the objects of my invention is to pro-
duce an improved junk basket fishing tool which
will be simple in construction, economical to
manufacture and efficient in operation as to
ability to collect both heavy and light objects.

A further object is to construct an improved
junk basket tool which will function to collect
objects by the reverse fluid circulation principle.

Still a further object is to so construct a junk
basket tool that a greater volume of circulated
fluid acting with greater velocity will be effective
at desired places to pick up and deposit objects
into the tool.

Yet a further object is to produce a junk basket
tool which will be less likely to become in-
operative by clogging than prior designed tools.

Another object is to produce a junk basket
tool in which circulated fluid will so pass there-
through that large and small objects can be
collected in different places and maintained
therein until the tool is removed from the well
bore.

Yet another object is to so construct a junk
basket tool that the pick-up fluid will be dis-
charged through an opening of considerable area,
but so designed and associated with parts of the
tool that it will have flow from the opening with
great force.

Still another object is to produce an improved
manner of mounting and supporting an inner
object receiving barrel in an outer barrel of a
junk basket tool.

Other objects of my invention will become
apparent from the following description taken in
connection with the drawings showing a pre-
ferred embodiment.

In the drawings:
Figures 1 and 2 are longitudinal sectional views
of the lower and upper portions, respectively, of
the improved junk basket tool;
Figure 3 is a bottom view of the tool; and
Figure 4 is a top view of the support ring for
the inner barrel showing its machined shape
accomplished before welding onto the outer bar-
rel.

Referring to the drawings in detail, my im-
proved junk basket tool, as disclosed, has at its
upper end a collar 18 whereby it can be attached
to the lower end of a drill pipe 11 by the usual
threaded connections. The collar 16 is threaded
to the upper end of a short pipe section 12 and
connected to this pipe section at its lower end
is a second collar structure 15 of special con-
struction, having reduced ends 14 and 15 with
external threads. Mounted on the upper reduced
end of this collar 15 is a cylindrical member
12 which will be of greater diameter than the
pipe 12 so as to be in spaced surrounding relation
to the said pipe. The annular space defined be-
tween the pipe and the cylindrical member pro-
vides a pocket P into which small or light objects
or articles will be collected. One side of the
cylindrical member 16, indicated by the number
17, is of greater length than the opposite side,
for a purpose which will be later described.

On the lower end 15 of the special collar 15
there is connected, to be suspended therefrom,
an outer hollow body member or barrel 18 of con-
siderable length having on the bottom thereof
teeth 18, as shown. These teeth are on a special
section 28 welded to the lower part of the barrel
and constituting a part of the barrel. Within
this outer barrel is an inner hollow body or bar-
rel 21 which is of less diameter than the outer
barrel. This inner barrel is secured to the wall of
the outer barrel, thus making the inner and
outer barrels eccentrically related, that is, their
longitudinal axes are offset with respect to each
other.

The lower end of the inner barrel is arranged
to be supported on a specially machined annular
ring 22 which is welded to the lower end of the
outer barrel 18 at some distance above the teeth
18. This ring will not only support the inner
barrel, but will provide a wall for the lower
end of the space, crescent shaped in cross sec-
tion, which is between the inner and outer bar-
rels. The ring, at one side, will be supported
by a chord member 23 extending across one side
of the lower part of the outer barrel and bring
beneath the ring and to which the ring will be
welded. The ring above the chord member will
be so cut as to be flush with the edge of the chord
member. The shape of the ring, before being
mounted, is as shown in Figure 4. The ring and
the chord member will thus establish an orifice
24 at the lower end of the space between the
inner and outer barrels and this orifice and the
shape thereof will be as shown in Figure 3. The
supporting ring 22 is also so machined that there
will be upwardly extending flanges 25 and 26
for receiving the lower end of the inner barrel
and causing it to properly set on the support
The upper end of the barrel will be attached to the outer barrel by screws 27, these screws also passing through a support cleat 28 placed on the inner surface of the inner barrel. The inner and outer barrels, and also the cleat, are provided with aligned slots to establish an elongated port or passage 29 which will permit fluid to flow out of the upper end of the inner barrel to the exterior of the outer barrel. At the lower end of the barrel there will be a catcher C of some suitable type. As shown, this catcher comprises a ring 30 to the upper end of which are secured a plurality of spring fingers 31, curved inwardly to form a dome-like structure. The arrangement of these fingers is such that any object can pass upwardly through the catcher by springing the fingers outwardly, but is prevented from going back through. Above the catcher C can be a second catcher C'. The catchers are maintained in spaced relation by a sleeve 32 and a ring 33 is welded to the inside of the inner barrel to hold the catchers and spacer sleeve in place. The upper catcher C' may be eliminated if not deemed necessary.

The upper end of the inner barrel has welded thereto a cylindrical ring 34 into which will be screwed a plug 35 provided with a cone-shaped valve seat 36 for controlling a passage 37. This valve seat is arranged to be engaged by a ball valve 38 which will rest on the seat by gravity. Above the member 35 is a flanged nipple 39 which is held on the member by the lower end 15 of the collar 13 when it is screwed into the outer barrel for attaching said barrel. Between the nipple and the collar will be a gasket 40 to insure a seal. The upper end of the member 35 is provided with radial ports 41 so as to permit fluid to flow downwardly from pipe 12 through collar 13, the nipple 39 and out into the space between the inner and outer barrels. In using the tool to recover objects, such as parts of drill bits, pins, pipe cuttings, etc., from the bottom of an earth bore, such as an oil well, the tool is attached to the lower end of a drill pipe and then placed in the bore. The ball 38 will fall out of the tool and into the drill pipe, if desired, so that the teeth at the bottom of the outer barrel will dislodge any objects which are desired to be retrieved. Simultaneously with, or following the rotating of the tool, fluid can be pumped down the drill pipe and this fluid will then flow through the short pipe 12, the collar 13, outer ports 41 and into the space between the inner and outer barrels, which space has considerable cross sectional area and thus can contain large volumes of fluid. The ball valve 38 will be maintained closed, due to the pressure of the fluid being pumped down the drill pipe and acting on the top thereof. Fluid which has entered the space between the inner and outer barrels will now be discharged through the ori-fices 37 at the lower end of the inner barrel and just above the teeth at the bottom of the outer barrel. This discharged fluid will be acting with considerable force and the cross sectional area of the discharged fluid stream will be considerable. As a result, the discharged fluid will drive into one side of the bottom of the hole below the lower end of the inner barrel and pick up and carry with it any objects which might be loose in this area. The fluid will then flow upward through the outlet at the lower end of the inner barrel, through the ori-fices 37 in the collar, and out through the port 39 to the exterior of the outer barrel and into the space between said barrel and the wall of the bore. From there it will continue to be forced upwardly along the outer side of said barrel, the upper end of the port and the outside of the drill pipe to the top of the bore. The fluid in the upper end of the inner barrel will not upset the ball because this fluid will act on the bottom of the ball with less pressure than the fluid which acts on the top of the ball and is being circulated down through the drill pipe. As the fluid being circulated moves upwardly alongside the cylindrical member 16, which, with the pipe 12, creates the pocket P, heavy sediment and light objects which are being carried with the fluid at this point can be caught in said pocket. The flow of fluid is shown by arrows in Figure 1.

All the fluid which is being circulated down through the drill pipe and forced out through the orifice 24 will not pass upwardly through the catchers. Some fluid, of course, will be forced out through the teeth 19 at the bottom of the outer barrel and this fluid will flow upwardly along the outer side of the barrel, as shown in Figure 1, and eventually join the stream of fluid which is moving upwardly from the port 29 after passing through the inner barrel. The amount of fluid forced out between or beneath the teeth will depend on how deep these teeth have cut into the bottom of the bore. Any light objects which might be carried upwardly alongside the outer barrel by fluid passing through or beneath the teeth will have possibility of being caught in the pocket P in the same manner as objects which move upwardly with the fluid coming from the bottom of the bore. The greatest volume of fluid which will be circulated will be that which passes through the inner barrel and out through the port 29. Because of this the cylindrical member, which forms the pocket P, is preferably shaped as shown, and has its long side 17 positioned directly above the port 29. Some of the fluid coming up from the port will flow to the opposite side of the tool around the cylindrical member 16, due to the fact that less volume of fluid will be flowing on such opposite side. Thus, as it goes around and over the slanting top edge of the member, it will tend to move over the top edge and drop its lighter objects. The general direction of the flow will be from the high side of the cylindrical member towards the low side. If the high side were opposite of the fluid flow shown, the fluid, acting at an angle with respect to the axis of the cylindrical member would hit the inside of the high wall and tend to swirl and scoop out objects which had been collected there instead of depositing only, as is done with the shown arrangement.

It will be noted that my improved "Jumbo" tool is very simple in construction, and also it is efficient in operation because its construction makes it possible to cause fluid acting in a continuous stream with considerable volume and with high velocity to engage and pick up objects. By having a single large stream of fluid flowing from
5 an orifice at one side of the lower end of the inner barrel containing the catcher, there will be an efficient means for catching objects because of mass and velocity. There will not be several streams "bucking" each other, as occurs in some "junk basket" tools now in use. By using the two barrels, as shown, and mounting them eccentrically, a large longitudinal space will be provided for easy flow of fluid without possibility of "clogging." It is not necessary to drill any passages to obtain a flow of fluid from the drill pipe down to the lower end of the tool. All the parts of the tool are easily and cheaply made. Assembly is simple and can be accomplished quickly. If any parts become defective and need replacement, this can be accomplished in a rapid manner. The tool permits not only the catching of large articles by a catcher, but also provides pocket means for catching lighter articles which are carried by fluid to points beyond the catcher means and upwardly around the outside of the tool.

Being aware of the possibility of modifications in the tool shown and described without departing from the fundamental principles of my invention, I desire it to be understood that the details shown in the drawing are not intended to be definitive, but that the invention may be practiced in a manner except in accordance with structure and its equivalent specified in the appended claims.

What is claimed is:

1. An earth bore tool attachable to a drill pipe for recovery of objects, comprising an outer barrel, a smaller diameter inner barrel, means for mounting one side of the inner barrel to the exterior of the outer barrel, and means for establishing a passage between the inner and outer barrels so that fluid can be discharged into the inner barrel up through the retainer and then out through the passage to the exterior of the outer barrel.

2. An earth bore tool for attachment to a drilling pipe comprising an outer barrel, an inner barrel of smaller diameter than the outer barrel positioned in the inner barrel with a side attached to the exterior of the outer barrel and so as to be eccentric thereto, means providing a passage between the top of the inner barrel and the drill pipe, a removable stop for prevents fluid flowing into the inner barrel, and means for directing fluid under pressure from the drill pipe into the space between the barrels and then to and into the lower end of the inner barrel, and comprising a single outlet at the lower end of the inner barrel, a catcher in the inner barrel, and means for permitting fluid to flow from the inner barrel below its top but above the catcher to the exterior of the outer barrel without entering the space between the barrels including aligned windows in engaged portions of the barrel walls.

3. An earth bore tool for attachment to a drilling pipe comprising an outer barrel, an inner barrel open at the lower end and of smaller diameter than the outer barrel positioned in the outer barrel with a longitudinal side attached to the inner surface of the outer barrel so as to be eccentric thereto, a catcher in the inner barrel, and means for directing fluid under pressure from the drill pipe into the space between the barrels, means for establishing a passage for permitting fluid to flow from the inner barrel above the catcher to the exterior of the outer barrel without entering the space between the barrels, a conduit member for connecting the outer barrel to the drilling pipe including threads on the member and outer barrel, and means comprising a cylindrical member carried by and surrounding the conduit member for providing a pocket open at the top and positioned above the passage.

4. An earth bore tool for recovery of objects, comprising an outer barrel for attachment to a drill pipe, a smaller diameter inner barrel, means for mounting the inner barrel on one side of the inner wall of the outer barrel so that its longitudinal axis will be eccentric and also so that its lower end is positioned above the lower end of the outer barrel, wall means between the lower end of the inner barrel and the outer barrel for causing fluid to flow into the lower end of the inner barrel at one side only thereof, means providing a passage from the interior of the inner barrel to the exterior of the outer barrel, an object retainer positioned in the inner barrel between its lower end and the passage, and means for circulating fluid from the drill pipe into the space between the inner and outer barrels so that fluid can be discharged into the lower end of the inner barrel, up through the retainer, and then out through the passage to the exterior of the outer barrel.

5. An earth bore tool for attachment to a drilling pipe comprising an outer barrel, an inner barrel of smaller diameter than the outer barrel positioned in the outer barrel and so mounted as to have a side wall positioned adjacent to the inner surface of the outer barrel so as to be eccentric thereto, means for directing fluid under pressure from the drill pipe into the space between the barrels, means for discharging fluid from the space to the lower end of the inner barrel at one side only thereof, means permitting fluid to flow from the inner barrel adjacent its top end to the exterior of the outer barrel without entering the space between the barrels, and means for establishing a pocket at the top and positioned above the point where fluid inside the inner barrel flows to the exterior of the outer barrel and exposed to the flow of the fluid after it leaves the said point, said pocket having a high side directly above the point where the fluid flows to the exterior of the outer barrel.

6. An earth bore tool for attachment to a drilling pipe comprising an outer barrel, an inner barrel of smaller diameter than the outer barrel positioned in the outer barrel with a side wall attached to the inner surface of the outer barrel so as to be eccentric thereto, a catcher in the inner barrel, means for directing fluid under pressure from the drill pipe into the space between the barrels to the lower end of the inner barrel, means permitting fluid to flow from the inner barrel above the catcher to the exterior of the outer barrel without entering the space between the barrels, and means for establishing a pocket.
open at the top and positioned above the point where fluid inside the inner barrel flows to the exterior of the outer barrel and exposed to the flow of the fluid after it leaves the said point, said last named means comprising a cylindrical member in spaced surrounding relation to a tubular part of the tool and having a higher wall on the side thereof which is vertically above where the fluid flows from the inner barrel to the exterior of the outer barrel.

7. An earth bore tool for recovery of objects, comprising an outer barrel for attachment to a drill pipe, a smaller diameter inner barrel, means for mounting the inner barrel inside of the outer barrel so that there will be a longitudinal space between the barrels and also so that the lower end of the inner barrel is positioned above the lower end of the outer barrel, means providing a passage from the interior of the inner barrel to the exterior of the outer barrel at one only of the outer barrel, an object retainer positioned in the inner barrel between its lower end and the passage, means including a tubular member above the barrels and to which the barrels are attached for circulating fluid from the drill pipe into the space between the inner and outer barrels so that fluid can be discharged into the lower end of the barrel, up through the retainer and out through the passage to the exterior of the outer barrel, and means establishing a collecting pocket above the passage from the interior of the inner barrel to the exterior of the outer barrel, said last named means comprising a cylindrical member in spaced surrounding relation with the tubular member and being open only at the top and having its wall higher on that side which is directly above the discharge end of the passage leading to the exterior of the outer barrel.

8. In a tool for attachment to a drill pipe and for recovery objects in an earth bore, a barrel, a catcher in the barrel, means for causing a major portion of the volume of fluid flowing down the drill pipe to be directed upwardly through the barrel and then outwardly through an outlet, at one side thereof into the bore outside the barrel where it will be free to pass upwardly, means causing the remaining volume of fluid flowing down the pipe to flow upwardly along the sides of the bore and without flowing through the barrel, and means providing a pocket above the outlet from the barrel, said pocket being open at the top and having its wall higher on one side of the bore than the other with the high wall being directly above the barrel outlet and thus

adjacent the path of flow of the major volume discharged by said outlet.

9. In a tool for attachment to a drill pipe for recovery objects in an earth bore, a barrel carried by the drill pipe and having an outlet at its upper end to the earth bore, means for establishing a conduit means outside the barrel connected to the drill pipe and bottom of the barrel for causing fluid flowing down the drill pipe and conduit means to be directed into the bottom of the barrel and then to flow upwardly through the barrel and outwardly through the outlet at one side thereof into the bore outside the barrel where it will be free to pass upwardly, a catcher in the barrel through which the fluid will pass, and means providing a pocket above the outlet where the fluid flows out of the barrel into the bore, said pocket having a higher wall on that side which is directly above the outlet than on the opposite side.

10. In a structure for attachment to a drill pipe and for recovery objects in a well bore, a conduit member having an upper threaded end to attach to the threads on the lower end of the drill pipe and through which fluid is circulated to the bottom of the well bore and returned in an upward flow exterior thereof, and a cylindrical member attached to the conduit member and of a size to surround the conduit member and have spaced relation to the wall thereof to provide a pocket into which objects carried upwardly by the flowing fluid can be lodged, means connected to the drill stem for causing fluid coming down the drill stem to have a greater volume of flow upwardly past the cylindrical member on one side than the other, said cylindrical member having a higher wall on the side of greater volume of upward fluid flow than the other thereby causing fluid to flow across the top of the cylindrical member in the direction of the low side and at an angle to the axis of the cylindrical member.

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