

July 25, 1967

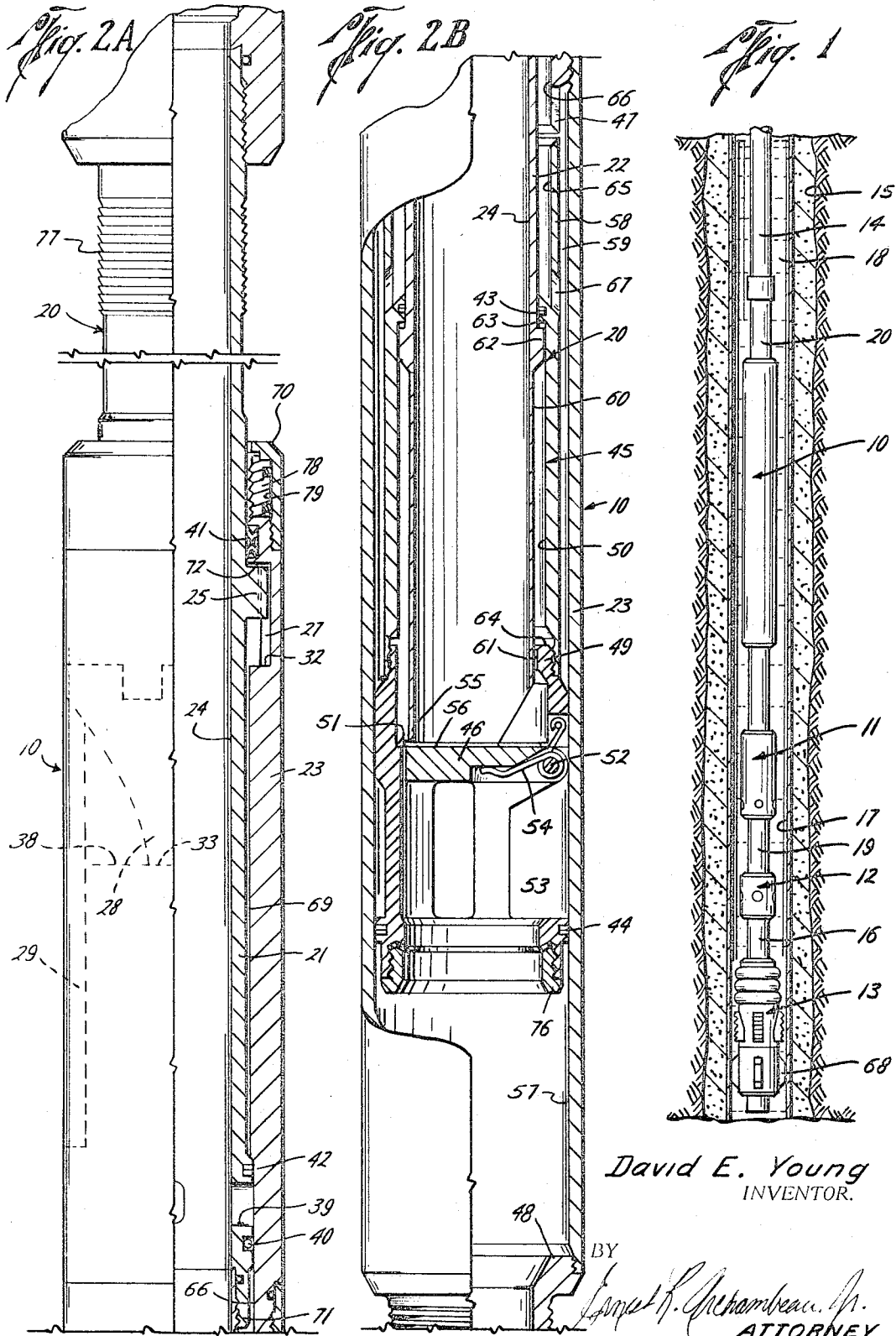
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FULL-OPENING WELL TOOLS

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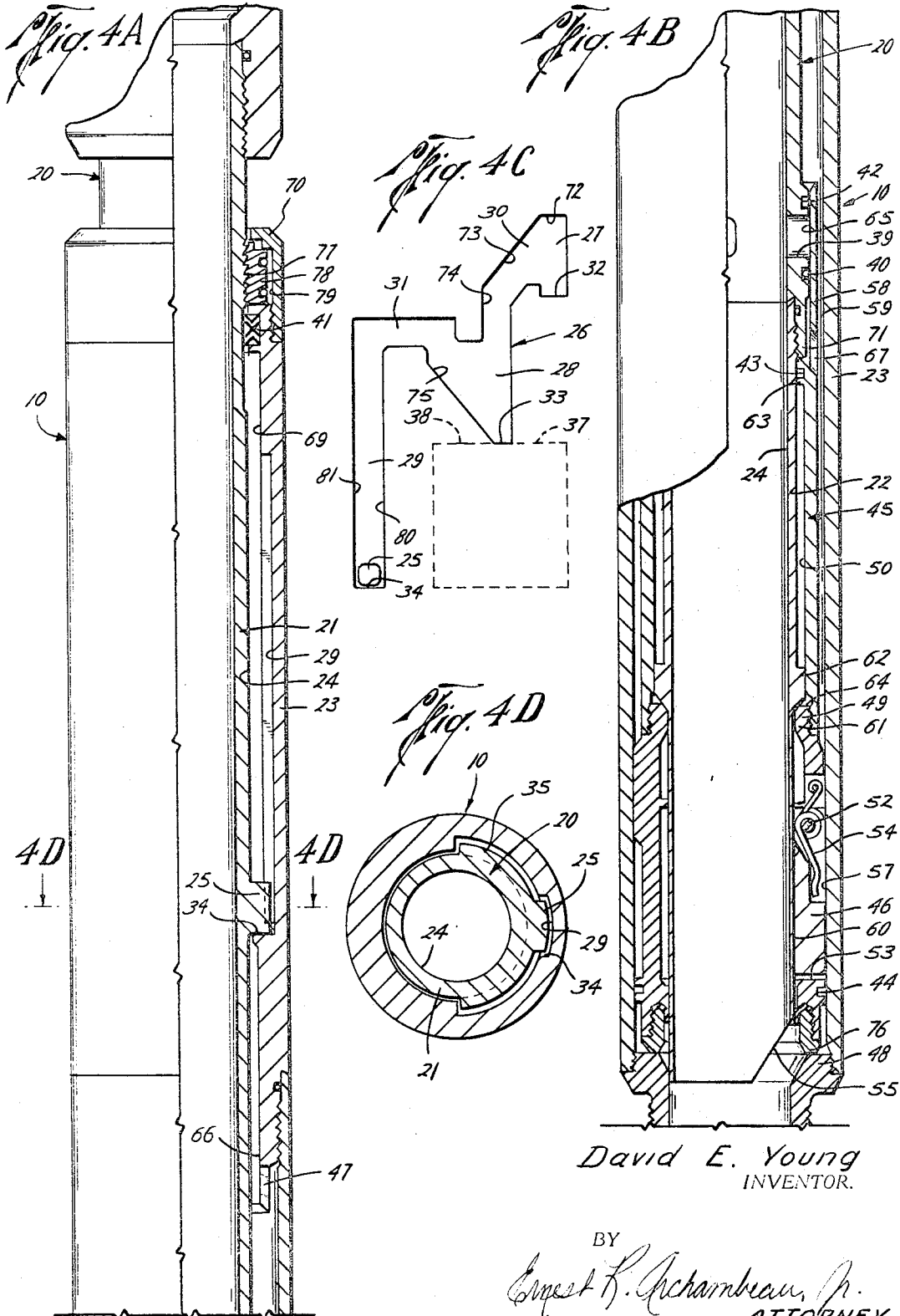
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FULL-OPENING WELL TOOLS

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ABSTRACT OF THE DISCLOSURE

This disclosure pertains to a well tool having telescoping inner and outer tubular members. A flapper type valve member is pivotally mounted on a separate slidably disposed tubular carrier and adapted for seating engagement on an annular valve seat supported in this slidable tubular carrier. By means of suitably located ports in the telescoped members, telescopic movement of the tubular members will first equalize any pressure differential across the valve member as the slidable carrier is shifted to a stop where its further movement is halted. Then, once the slidable carrier is halted, continued movement of the telescoped members will open the valve member.

Accordingly as will subsequently become apparent, this invention relates to well tools; and, more particularly, pertains to well tools capable of performing repetitive testing or treating operations as well as being selectively operable to provide an unrestricted central passage therethrough.

It is customary to dependently couple a number of different full-bore tools from a tubing string for performing such operations as testing a formation under flowing or static conditions, squeeze cementing, acidizing or fluid-fracturing. Such a string of full-bore tools usually includes a full-bore packer for packing-off the well bore to remove the hydrostatic pressure of the well control fluid from the formations below where the packer is set. In a number of these operations, it is preferred that the lower end of the tubing string be closed above the packer to prevent fluids in the well bore from entering the tubing string as the tools are being positioned. Thus, by keeping the tubing string "dry," it will be unnecessary to remove fluids from the tubing by swabbing or gas displacement before testing or completion operations can be started. Moreover, by selectively closing the lower end of the tubing string, treating fluids can be placed in the tubing string and selectively discharged below the packer without becoming contaminated by fluids in the well as the tools are being shifted from one position to another.

In addition to selectively controlling fluid communication, it is particularly desirable to have a tool so versatile that it can also be opened to leave an unrestricted longitudinal passage large enough to pass various completion tools as well as high flows of fracturing fluids. Although various tools having a full-opening passage have been used heretofore, such tools normally employ either a removable center section or else a flapper valve that must be opened against the full differential pressure across the tool. In addition to being more complex, tools with removable center sections require special retrieving equipment and the center sections must be replaced to reclose the central passage. On the other hand, although those tools using pivoted flapper valves are less complex and can be reclosed when desired, it is not uncommon that these valves are damaged when opened against extreme differential pressures.

Accordingly, it is an object of the present invention to provide new and improved full-opening tools that are selectively operable to control fluid communication through a tubing string as well as capable of being easily opened

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against high pressure differentials to leave an unrestricted passage therethrough.

This and other objects of the present invention are obtained by telescopically arranging an inner tubular member having a lateral port within an outer tubular housing, with the inner member being movable between an extended and a telescoped position for respectively closing and opening fluid communication between the inner and outer members through the port. A tubular member carrying a pivoted valve element that is normally seated on an annular valve seat is slidably mounted within the housing, with the lower end of the inner member extending through the valve seat and engaged with the valve element. Whenever the inner member is moved toward its telescoped position, the valve carrier will shift and the valve element remains closed until fluid communication is opened through the lateral port to reduce the fluid pressure differential across the valve element. Once the pressure differential across the valve element has been substantially reduced, the carrier will no longer move along with the inner member and the inner member will then pass through the valve seat to open the valve element.

The novel features of the present invention are set forth with particularly in the appended claims. The present invention, both as to its organization and manner of operation together with further objects and advantages thereof, may best be understood by way of illustration and example of certain embodiments when taken in conjunction with the accompanying drawings, in which:

FIG. 1 shows a string of well tools, including a tool of the present invention, as they may appear within a well bore;

FIGS. 2A and 2B are successive elevational views of one embodiment of a tool arranged in accordance with the present invention as it appears in one of its operating positions;

FIGS. 3A and 3B are successive elevational views showing the tool of FIG. 2 in a different operating position;

FIG. 3C is a schematic representation of a control slot showing the position of a mandrel lug therein;

FIG. 3D is a cross-sectional view taken along the lines "3C" in FIG. 3A;

FIGS. 4A and 4B are successive elevational views showing the tool of FIG. 2 in still another operating position;

FIG. 4C is a view similar to FIG. 3C but showing the mandrel lug in a different position; and

FIG. 4D is a cross-sectional view taken along the lines "4D" of FIG. 4A.

Turning now to FIG. 1, a number of full-bore well tools 10-13 are shown tandemly connected to one another and dependently coupled from the lower end of a tubing string 14 in a cased well bore 15. At the lower end of these tools, a conventional full-bore packer 13 is arranged for selectively packing-off the well bore 15. A conventional hydraulic holddown 12 is coupled to the mandrel 16 of the packer 13 and arranged to engage the casing 17 to secure the mandrel against upward movement whenever the packer is set and the pressure within the tubing string 14 exceeds the hydrostatic pressure of the control fluid 18 in the well bore 15. A typical bypass valve 11, coupled by a tubing sub 19 above the holddown 12, is suitably arranged to be opened to facilitate shifting the tools 10-13 within the fluid-filled well bore 15 by diverting a substantial portion of the fluids 18 through the central bore of the retracted packer 13. Connected at the upper end of this string of tools 10-13 is a tool 10 incorporating the principles of the present invention.

Turning now to FIGS. 2 through 4, a series of elevational views, partially in cross-section, are shown of the tool 10 in its various operating positions. The full-bore

tool 10 includes a movable tubular mandrel 20 having an enlarged-diameter upper portion 21 and a reduced-diameter lower portion 22 telescopically disposed within a tubular housing 23 and arranged for selective telescopic movement therein between extended (FIG. 2), intermediate (FIG. 3) and telescoped (FIG. 4) positions. The upper end of the mandrel 20 is arranged for coupling to the tubing string 14 (FIG. 1) with the central bore 24 of the mandrel being substantially the same diameter as that of the tubing string. Similarly, the lower end of the housing 23 is arranged for coupling to other well tools such as the full-bore packer 13 shown in FIG. 1.

For establishing the various positions of the mandrel 20 relative to the housing 23, an outwardly projecting lug 25 on the upper mandrel portion 21 is slidably received within a somewhat downwardly directed "E-shaped" slot system 26 formed in the internal wall of the housing. As best seen in FIG. 3C, this slot system 26 is formed of three progressively longer longitudinal slots 27, 28 and 29 that are spaced around the housing 23 and interconnected by short, transverse slots 30 and 31, with the lower ends of the longitudinal slots being closed to provide longitudinally spaced shoulders 32, 33 and 34 which establish the position of the mandrel 20 relative to the housing.

As seen in FIGS. 3C and 3D, shoulders 35 and 36 are provided on the mandrel 20 on opposite sides of the lug 25 and adapted to engage housing shoulders 37 and 38 on opposite sides of the lower shoulder 33 of the middle slot 28. Thus, whenever the mandrel 20 has been shifted to its intermediate position and the lug 25 is engaged with the shoulder 33 of the middle slot 28, mandrel shoulders 35 and 36 will rest on their mating housing shoulders 37 and 38 to better distribute the downwardly directed forces from the mandrel 20 to the housing 23.

One or more lateral ports 39 are provided through the upper mandrel portion 21, with an O-ring 40 around the mandrel below the ports fluidly sealing the mandrel 20 to the housing 23 whenever the mandrel is in its extended position (FIG. 2). A sealing member 41 is also provided to fluidly seal the mandrel 20 to the upper end of the housing 23. A number of elastomeric wiper rings 42-44 are disposed on certain members of the tool 10 to wipe away any accumulated matter that might otherwise become lodged between close-fitting surfaces. These wiper rings 42-44 do not necessarily, however, fluidly seal the relatively moving members to one another.

A tubular member 45 carrying a pivoted flapper valve 46 is slidably disposed in the lower portion of the housing 23 around the lower mandrel portion 22 and is arranged to travel in the housing between spaced shoulders 47 and 48. An annular shoulder 49 projecting into the central passage 50 of the tubular carrier 45 just above the flapper valve 46 provides a downwardly facing annular valve seat 51 adapted to be engaged by the flapper valve. The flapper valve 46 is pivotally mounted by a transverse pin 52 on one side of the valve carrier 45 so that the valve can swing downwardly from a horizontal passage-blocking position (FIGS. 2 and 3) on the valve seat 51 into a vertical position (FIG. 4) within a sidewall recess 53 immediately below the pivot pin. A spring 54 is suitably arranged to bias the valve 46 upwardly into sealing engagement with the valve seat 51 for blocking the central passage 50 through the carrier 45. As best seen in FIGS. 2A and 2B, when the mandrel 20 is in its extended position relative to the housing 23, the lowermost end 55 of the reduced-diameter mandrel portion 22 is adjacent to the upper face 56 of the seated flapper valve 46.

The lower portion of the valve carrier 45 is sized and arranged for a sliding fit within the housing bore 57 to maintain the carrier in coaxial alignment. The upper portion 58 of the carrier is reduced in diameter, however, to provide an annular space 59 between the carrier and the housing 23. The lower end of the reduced mandrel portion 22 is flattened on one side 60 and slidably engaged

with a complementary flat 61 on the valve carrier 45 to maintain these members and the flapper valve 46 angularly aligned. An external shoulder 62 on the lower mandrel portion 22 is adapted to engage spaced, inwardly directed abutments 63 and 64 on the carrier 45 above and below the mandrel shoulder 62. The upper portion 58 of the carrier 45 is sized to provide an internal bore 65 substantially the same as that of the housing bore 66 immediately thereabove for purposes subsequently to be described. A lateral port 67 is provided through the upper portion 58 of the carrier 45 to prevent foreign matter from collecting within the internal bore 65 above the upper abutment 63 on the carrier.

Turning now to the operation of the tool, the tool 10 is connected in a string of tools, such as that shown in FIG. 1, and is initially disposed in the extended telescopic position shown in FIG. 2. As the tool 10 is being lowered into the well bore 15 shown in FIG. 1, the frictional restraint of the drag blocks 68 on the packer 13 with the casing 17 will tend to restrain the housing 23 and the downward force on the tubing string 14 will initially shift the mandrel lug 25 downwardly against the housing shoulder 32 in slot 27.

Since the wiper 42 above the lateral ports 39 does not provide a fluid-tight seal, it will be appreciated that the annular space 69 intermediate the fluid seals 40 and 41 will be at whatever pressure, usually atmospheric, there is in the tubing string 14. Thus, the well control fluid 18 will act downwardly on the upper housing end 70 and upwardly on the lower end 71 of the upper mandrel portion 21. Accordingly, as the differential between the hydrostatic pressure and tubing pressure increases, the mandrel 20 will be shifted upwardly and the housing 23 will be shifted downwardly until the mandrel lug 25 is against the shoulder 72 at the upper end of slot 27.

Thus, by suitably proportioning the effective cross-sectional areas through the O-ring 40 below the lateral port 39 and through the sealing member 41 at the upper end 70 of the housing 23, it will be seen that there is a net force which maintains the mandrel 20 in its elevated position (FIG. 2) relative to the housing which must first be overcome before the mandrel can be shifted downwardly to place the tool 10 in its other operating positions. This will have the obvious advantages of providing somewhat of a "shock-absorber" action as a string of tools is being lowered into a well bore.

Once tool 10 has reached the depth at which it is to be operated, the housing 23 is first secured relative to the casing 17. This may be done, for example, by first setting the packer 13 (FIG. 1) and securing the tool housing 23 to the casing 17 in such a manner that the tubing string 14 and tool mandrel 20 may then be moved relative to the housing. As a matter of convenience, the packer 13 (as shown in FIG. 1) is preferably of the so-called "compression-set" type and may be provided with a lug and slot system (not shown) that are similar to those of the tool 10. Thus, the packer 13 will be set by picking up on the tubing string 14 and then slacking off while applying clockwise torque to the tubing string. Since there is a restraining force acting upwardly on the tool mandrel 20, the packer 13 will be set before this restraining force is overcome.

Once the packer 13 has been sufficiently set to secure the tool housing 23, a downward force can be applied on the tool mandrel 20 that is sufficient to overcome the restraining force. As the mandrel 20 is torqued to the right, the lug 25 will slide downwardly along the inclined surface 73 of the transverse slot portion 30 until it reaches the vertical surface 74. At this point the mandrel 20 will shift on downwardly to bring the lug 25 and its adjacent shoulders 35 and 36 into engagement with the housing shoulders 33, 37 and 38, respectively.

Turning now to FIG. 3A and 3B, the tool 10 is shown in its intermediate position with the mandrel lug 25 engaged with shoulder 33 of the slot 28. The valve carrier 45

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has been shifted downwardly by the mandrel 20 and halted a short distance above the lower housing shoulder 48. As the mandrel 20 was shifted downwardly to this position, the O-ring 40 below the mandrel ports 39 cleared the shoulder 47 and established fluid communication into the annular space 59 around the carrier 45 and through the ports 39 into the central bore 24 of the mandrel 20.

Thus, by the time the mandrel 20 has reached its intermediate position, the pressure will have equalized across the flapper valve 46 and only the biasing spring 54 will be keeping the valve seated. The flapper valve 46 cannot be opened, however, so long as the mandrel 20 is in this intermediate position since the carrier 45 is spaced above the housing shoulder 48.

It will be appreciated, however, that selective fluid communication will be provided between the well bore 15 below the packer 13 and the tubing string 14 by shifting the mandrel 20 upwardly and downwardly within the limits provided by the length of slot 28. Accordingly, by shifting the mandrel 20 upwardly and downwardly within the limits of the elongated slot 28, any number of treating operations, such as acidizing, could be completed. It would be equally feasible, of course, to return the mandrel 20 to its extended position as shown in FIG. 2 and release the packer 13 so as to relocate the string of tools 10-13 at a different depth in the well bore 15.

When such treating operations as cementing or fracturing are to be conducted, the mandrel 20 is again picked up and torqued to the right to carry the lug 25 along the inclined surface 75 of the slot 28 into the upper end of the elongated slot 29. Then, by slacking-off weight, the mandrel 20 is again shifted downwardly relative to the still-stationary housing 23. As the mandrel 20 moves downwardly, the bottom 76 of the valve carrier 45 will engage the lower housing shoulder 48 to permit the mandrel to be moved relative to the carrier.

Thus, as best seen in FIGS. 4A and 4B, by overcoming the bias of the spring 54, the lower end 55 of the mandrel portion 22 will open the flapper valve 46 and move downwardly through the valve seat 51 and carrier 45 until it has reached the housing shoulder 48. As the mandrel 20 moves downwardly, upwardly directed teeth 77 around the upper end of the upper mandrel portion 21 will ratchet through an expansible nut 78 received in an internal annular recess 79 at the upper end 70 of the housing 23. Once the mandrel 20 has reached the telescoped position as shown in FIGS. 4A and 4B, the expansible split-nut 78 will engage the mandrel teeth 77 to hold the mandrel in this position. It should also be noted that when the mandrel 20 has reached this position, the lateral ports 39 are received within the bore 65 in the upper portion 58 of the valve carrier 45 so that cement and the like cannot flow through the ports into the annular space 59 around the mandrel.

It will be appreciated that with the tool 10 in the position shown in FIG. 4, the mandrel 20 is relatively fixed with respect to the housing 23 against both rotation and longitudinal shifting. The interengagement of the lug 25 within the vertical walls 80, 81 of the elongated slot 39 will permit torque to be applied in either direction through the tool 10. Similarly, the lower housing shoulder 34 will prevent the mandrel 20 from traveling further downwardly with respect to the housing 23 and the split-nut 78 and mandrel teeth 77 will prevent it from returning upwardly relative to the housing. It will be appreciated, of course, that once the tool 10 has been placed in the position shown in FIG. 4, it will remain in this position until retrieved. Then, whenever the tool 10 is disassembled for cleaning and checking, the threaded engaged cap forming the upper end 70 of the housing 23 is removed to expand the split-nut 78 and return the mandrel 20 to its extended position.

Accordingly, it will be appreciated that the tool 10 is capable of being selectively opened and closed to provide

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fluid communication from the tubing string into the well bore below the tool. Moreover, a full-opening passage can be opened through the tool 10 whenever it is desired to admit a completion tool or a large volume of treating materials. Although a flapper valve is employed to provide a full-opening control passage, the combination of the selectively opened equalizing passages with the floating carrier will permit the valve to be opened with minimum of effort.

While a particular embodiment of the present invention has been shown and described, it is apparent that changes and modifications may be made without departing from this invention in its broader aspects; and, therefore, the aim in the appended claims is to cover all such changes and modifications as fall within the true spirit and scope of this invention.

What is claimed is:

1. In a well tool adapted for connection in a string of pipe for use in a well bore: means for selectively controlling fluid communication between a well bore and a string of pipe disposed in the well bore including a tubular housing member, a tubular body member telescopically received in said housing member and movable in relation thereto between expanded and contracted positions, a valve body having an annular valve seat and slidably mounted in said housing member, adjacent to said body member, a valve member pivotally mounted on one side of said valve body and normally seated on said valve seat, first means adapted for passage through said valve seat and engageable with said valve member for shifting said valve member and valve body as said telescoped members are moved toward said contracted position, normally-closed bypass means for providing fluid communication across said valve seat when said telescoped members are displaced to a location intermediate of said positions, and second means stopping said valve body when said telescoped members are between said location and contracted position so said first means can pass through said valve seat and unseat said valve member as said telescoped members approach said contracted position; and means connected to one of said telescoped members engageable with a well bore in response to movement of said telescoped members toward said contracted position for securing said one telescoped member relative to a well bore.

2. In a well tool adapted for connection in a string of pipe for use in a well bore: means for selectively controlling fluid communication between a well bore and a string of pipe disposed in a well bore including a tubular housing member, a tubular body member telescopically received in said housing member and movable in relation thereto between expanded and contracted positions, a valve body having an annular valve seat and slidably mounted in said housing member adjacent to said body member, a valve member pivotally mounted on one side of said valve body and normally seated on said valve seat, first means on said body member adapted for passage through said valve seat and engageable with said valve member for shifting said valve member and valve body as said telescoped members are moved toward said contracted position, normally-closed bypass means for providing fluid communication across said valve seat when said telescoped members are displaced to a location intermediate of said positions, and second means stopping said valve body when said telescoped members are between said location and contracted position so said first means can pass through said valve seat and unseat said valve member as said telescoped members approach said contracted position; and means for packing-off a well bore including expansible packing means connected to one of said telescoped members and expandable into sealing engagement with a well bore in response to movement of said telescoped members toward said contracted position for packing-off a well bore and securing said one telescoping member against motion relative to a well bore.

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3. In a well tool adapted for connection in a string of pipe for use in a well bore having a fluid therein: means for selectively controlling fluid communication between a well bore and a pipe string disposed in a well bore including a tubular housing member, a tubular body member telescopically received in said housing member and movable in relation thereto between expanded and contracted positions, a valve body slidably mounted in said housing member adjacent to one end of said body member and having an annular valve seat adapted to receive said end of said body member, a valve member pivotally mounted on one side of said valve body, said valve body and valve member being movable by said body member, means normally urging said valve member onto said valve seat, means responsive to the hydraulic pressure of well bore fluid for retarding movement of said telescoped members toward said contracted position including longitudinally spaced first and second sealing means fluidly sealing said telescoped members to one another in said expanded position and a port in said body member providing communication between said sealing means and the interior of said body member when said telescoped members are in said expanded position, bypass means including said port operative when said telescoped members are moved to a location intermediate of said positions to provide fluid communication across said valve seat, means stopping said valve body when said telescoped members are between said location and contracted position so said end of said body member can pass through said valve seat and unseat said valve member as said telescoped members approach said contracted position; and means for packing-off a well bore including expandable packing means connected to one of said telescoped members and expandable into sealing engagement with a well bore in response to movement of said telescoped members toward said contracted position for packing-off a well bore and securing said one telescoped member relative to a well bore.

4. In a well tool: a tubular housing member; a tubular body member telescopically received in said housing member, said members being adapted for connection in a string of pipe and movable in relation to one another between expanded and contracted positions; a valve body having an annular valve seat and slidably mounted in said housing member adjacent to said body member; a valve member pivotally mounted on one side of said valve body and normally seated on said valve seat; first means adapted for passage through said valve seat and engageable with said valve member for shifting said valve member and valve body as said telescoped members are moved toward said contracted position; normally-closed bypass means for providing fluid communication across said valve seat when said telescoped members are displaced to a location intermediate of said positions; and second means stopping said valve body when telescoped members are between said location and contracted position so said first means can pass through said valve seat and unseat said valve member as said telescoped members approach said contracted position.

5. In a well tool: a tubular housing member; a tubular body member telescopically received in said housing member, said members being adapted for connection in a string of pipe and movable in relation to one another between expanded and contracted positions; a valve body slidably mounted in said housing member adjacent to one end of said body member and having an annular valve seat adapted to pass said one end of said body member; a valve member pivotally mounted on one side of said valve body and normally seated on said valve seat, said valve body and valve member being movable by said body member; bypass means including a port in said body member and means fluidly sealing said port when said telescoped members are in said expanded position for preventing fluid communication through said port until said telescoped members are moved to a location intermediate of said positions to provide fluid communication through

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said port and across said valve seat; and means stopping said valve body when said telescoped members are between said location and contracted position so said one end of said body member can pass through said valve seat and unseat said valve member as said telescoped members approach said contracted position.

6. In a well tool: a tubular housing member; a tubular body member telescopically received in said housing member, said members being adapted for connection in a string of pipe and movable in relation to one another between expanded and contracted positions; a valve body slidably mounted in said housing member adjacent to one end of said body member and having an annular valve seat adapted to pass said one end of said body member; a valve member pivotally mounted on one side of said valve body and normally seated on said valve seat, said valve body and valve member being movable by said body member; bypass means including a port in said body member and means fluidly sealing said port when said telescoped members are in said expanded position for preventing fluid communication through said port until said telescoped members are moved to a location intermediate of said positions to provide fluid communication through said port and across said valve seat; means stopping said valve body when said telescoped members are between said location and contracted position so said one end of said body member can pass through said valve seat and unseat said valve member as said telescoped members approach said contracted position; and means for closing said port when said telescoped members are in said contracted position.

7. In a well tool: a tubular housing member; a tubular body member having one end telescopically received in said housing member, said members being adapted for connection in a string of pipe and movable in relation to one another between expanded and contracted positions; a valve body slidably mounted in said housing member adjacent to said one of said body member and having an annular valve seat adapted to pass said one end of said body member; a valve member pivotally mounted on one side of said valve body and normally seated on said valve seat, said valve body and valve member being movable by said body member; means for retarding movement of said members toward said contracted position; bypass means including a port in said body member and means fluidly sealing said port when said telescoped members are in said expanded position for preventing fluid communication through said port until said telescoped members are moved to a location intermediate of said positions to provide fluid communication through said port and across said valve seat; means stopping said valve body when said telescoped members are between said location and said contracted position so said one end of said body member can pass through said valve seat to unseat said valve member as said telescoped members approach said contracted position; and means for closing said port when said telescoped members are in said contracted position.

8. In a well tool adapted for connection in a string of pipe for use in a well bore having a fluid therein: a tubular housing member having a reduced-diameter bore portion and an enlarged-diameter bore portion; a tubular body member telescopically received in said housing member and movable in relation thereto between expanded and contracted positions; a valve body slidably mounted in said enlarged-diameter bore portion adjacent to one end of said body member and having an annular valve seat adapted to pass said one end of said body member; a valve member pivotally mounted on one side of said valve body, said valve body and valve member being movable by said body member; means normally urging said valve member onto said valve seat; means responsive to the hydraulic pressure of well bore fluid for retarding movement of said telescoped members toward said contracted position including longitudinally spaced first and

second sealing means between said telescoped members in said reduced bore portion and a port in said body member between said sealing means, one of said sealing means being ineffective whenever said telescoped members are moved to a location intermediate of said positions to provide fluid communication across said valve seat; and means stopping said valve body when said telescoped members are between said location and contracted position so said one end of said body member can pass through said valve seat and unseat said valve member as said telescoped members approach said contracted position.

9. In a well tool adapted for connection in a string of pipe for use in a well bore having a fluid therein: a tubular housing member having a reduced-diameter bore portion and an enlarged-diameter bore portion; a tubular body member telescopically received in said housing member and movable in relation thereto between expanded and contracted positions; a valve body slidably mounted in said enlarged-diameter bore portion, said valve body having a tubular end portion adjacent to one end of said body member adapted to pass a portion of said body member and an annular valve seat adapted to pass said one end of said body member; a valve member pivotally mounted on one side of said valve body, said valve body and valve member being movable by said body member; means normally urging said valve member onto said valve seat; means responsive to the hydraulic pressure of well bore fluid for retarding movement of said telescoped members toward said contracted position including longi-

tudinally spaced first and second sealing means between said telescoped members in said reduced bore portion and a port in said portion of said body member between said sealing means, one of said sealing means being ineffective when said telescoped members are moved to a location intermediate of said positions to provide fluid communication across said valve seat; means stopping said valve body when said telescoped members are between said location and contracted position so said one end of said body member can pass through said valve seat and unseat said valve member as said telescoped members approach said contracted position and said portion of said body member having said port can be received within said tubular end portion of said valve body when said telescoped members are in said contracted position; and means including said one sealing means for closing said port when said portion of said body member is received within said tubular end portion of said valve body.

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