

PauperPumper

This design will pump water from shallow or deep wells. The pump cost \$3.60 at retail, single-piece pricing (17 Oct 2005). The tubing and plunger costs depend, of course, on the depth of the well. There are several options to close in the well head and route the produced fluid.

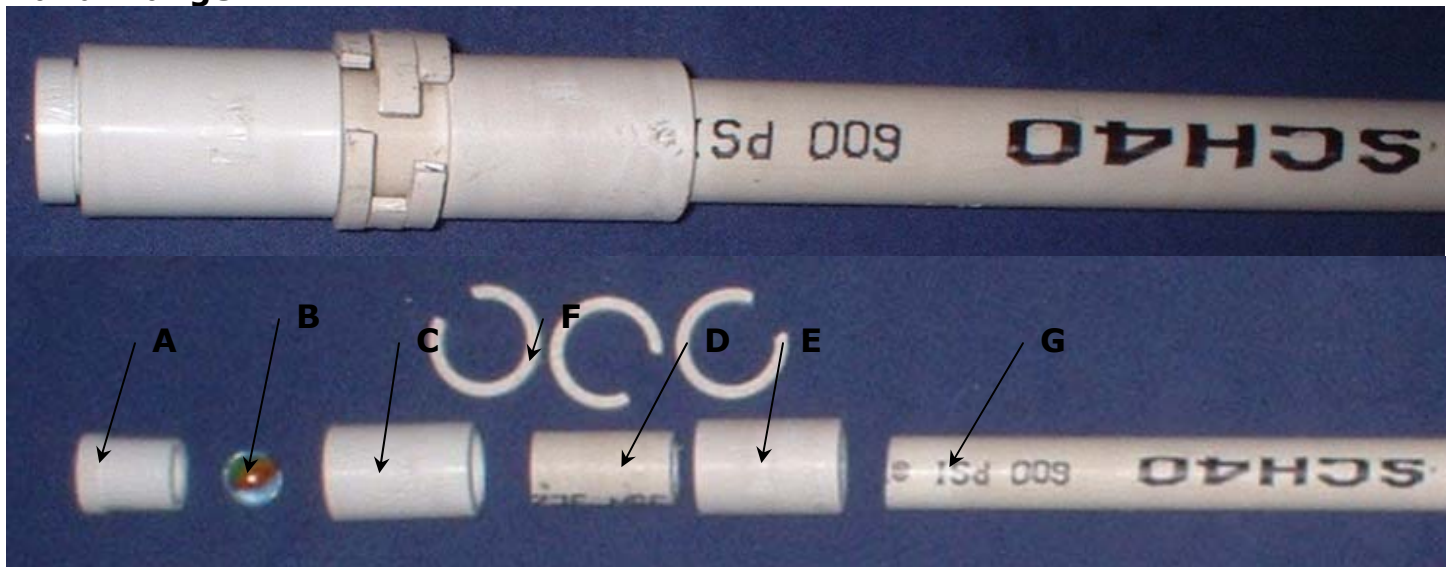


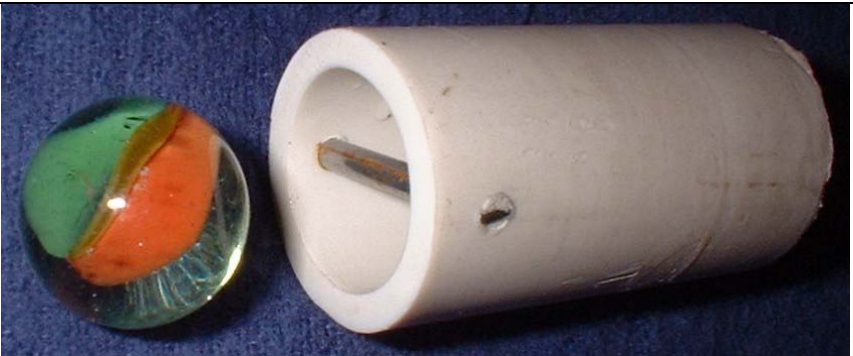

There are, of course, drawbacks and limitations. The ring seals will eventually wear a hole in the barrel wall. The nail could deform and allow the marble to seat, thereby restricting flow. The early performance-to-price ratio is encouraging. Simplicity, availability, longevity and so forth are likewise inviting.

Reviews, field experience, optimizations, improvements and other comments are welcomed and solicited.

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Build Plunger



| ✓ | Step | Notes |
|---|--|--|
| | Drill out the end of 0.50in plug (A) | |
| | Cut 1.75in section (D) from 0.50in diameter, Sch40 pipe | |
| | Drill interference fit hole through the end of the pipe segment (D) and press fit nail segment through end of the pipe segment. The nail prevents the marble from seating on the end of the pipe segment on the down stroke. |  |
| | Cut 3 rings (F) from 1.00in diameter Sch40 pipe and cut a 0.50in slot from each ring. The ring serves as a friction fit seal to the inside of the Barrel. |  |
| | Cut 24in section (G) from 0.50in diameter, Sch40 pipe | |

| | | |
|--|---|--|
| | Place plug (A) into one end of coupling (C) | |
| | Drop marble (B) into coupling/plug assembly | |
| | Capture marble by placing nail-end of pipe section (D) into other end of coupling (C) | |
| | Place coupling (E) onto non-nail-end of pipe section (D) | |
| | Fit pipe section (F) into other end of coupling (E) | |

The plunger is now complete



Build Barrel



| ✓ | Step | Notes |
|---|---|-------|
| | Cut 2.00in section (Q) from 0.75in diameter, Sch40 pipe | |
| | Drill interference fit hole through the end of 1.00in-0.75in bushing (N) and press fit nail segment through end of the bushing. The nail prevents the marble from seating on the end of the bushing on the up stroke. | |
| | Place coupling (N) over bushing (L) | |
| | Drop marble (M) into coupling/bushing assembly | |
| | Fit bushing (P) into other end of coupling (N) | |
| | Fit 2.00in pipe section (Q) into open end of bushing (P) | |
| | Place bushing (R) onto pipe section (Q) | |
| | Place coupling (S) into bushing (R) | |
| | Fit pipe section (T) into other end of coupling (S) | |

The barrel is now complete

Build Pump

| ✓ | Step | Notes |
|---|---|---|
| | Fit Plunger into Barrel. |  |
| | Compress each of the rings while gently pressing the Plunger into the Barrel. |  |

Suggest fitting threaded adapters to plunger and barrel ends. This allows incremental installation and standardization.

Suggest plunger T-handle with cap on one end; fluid produced out end of handle.

Bill of Material

Plunger Assembly

| Part | Qty | Description | Cost |
|-------------|------------|----------------------------|-------------|
| A | 1 | Plug, 0.50in | 0.17 |
| B | 1 | Marble, 0.625in dia | 0.01 |
| C | 1 | Coupling, 0.50in | 0.29 |
| D | 1.8 | Pipe, 0.50in x 1.75in | 0.02 |
| E | 1 | Coupling, 0.05in | 0.29 |
| F | 3 | Ring, 1in x 0.25in, w/ gap | 0.00 |
| G | 36 | Pipe, 0.50in | 0.46 |
| | | | \$1.24 |

Barrel Assembly

| Part | Qty | Description | Cost |
|-------------|------------|---------------------|-------------|
| L | 1 | Bushing, 1inx0.50in | 0.52 |
| M | 1 | Marble, 0.95in dia | 0.01 |
| N | 1 | Coupling, 1.00in | 0.33 |
| P | 1 | Bushing, 1inx0.75in | 0.43 |
| Q | 2 | Pipe, 0.75in | 0.02 |
| R | 1 | Bushing, 1inx0.75in | 0.43 |
| S | 1 | Coupling, 1.00in | 0.33 |
| T | 24 | Pipe, 1.00in | 0.28 |
| | | | \$2.36 |