

The following is from the patent application. Picture 4 shows the bilge pumps in the 7-foot sub. Everything in the hull can be removed in about five minutes. The bilge pumps are not attached except for the connection to the plumbing.

Fixed to the hull are only the jet nozzles and plumbing. The battery is held in place with a simple hose clamp. The bilge pumps are attached to PVC pipe using rubber hose connectors. The watertight chamber, housing the radio receiver, the solid-state switching device and the automotive relays, simply unplugs, it is not held in place. Empty plastic water bottles are placed in the hull for trimming adjustment (buoyancy adjustment). Also I have three different weight Rams which can be screwed into the front for additional adjustment.

I believe there are 10 bilge pumps, 5 in front of the battery, 5 in the stern, six relays in the WTC and 4 external. It is a 4-channel radio and by using combinations of bilge pumps all directions are possible. The bilge pumps are extremely reliable, I've only had one go bad and the sub has been down at least 30 feet and probably even deeper many times.

The subs are kept in my backyard exposed to all the elements (summer and winter). There is no maintenance needed except the occasional cleaning of battery electrical contacts. The sub hulls in both the 4 foot and 7 foot are probably thicker than what most hulls are because for one, I have a habit to over design and I wanted them tough, able to take not only the elements but any physical abuse such as hitting underwater obstructions at full speed. Which I have done.

With all the internals, the 7-foot weighs about 100 pounds and the 4-foot probably a little less than half that, 40-45 pounds. The fiberglass in the 7-foot is probably as much as half inch thick in places and probably no less than quarter-inch. The rakers and side fins are also very thick & sturdy, again to provide protection to the hull. In every aspect the sub has been designed for durability and reliability and in practice succeeds very well at both.

I'm sure this model Nautilus would have no problem ripping the bottom out of any model target. Additionally economics and ease of maintenance were also priorities. As with most things aquatic, bigger costs more. The large bilge pumps in the 7-foot sub can be expensive (\$75 apiece). The 4 foot sub is much more economical, there are only six bilge pumps at about \$35 apiece.

#### Description Of The Pictures

Picture 1 -- picture of 4 ft. sub

Picture 2 -- picture of 7 ft. sub

Picture 3 -- picture of typical bilge pump

Picture 4 -- picture showing placement of bilge pumps in model submarine hull.

Picture 5 -- picture showing solid-state switching device

Picture 6 -- picture showing typical automotive type relays

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References Cited [Referenced By]

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U.S. Patent Documents

# Top View of Submarine

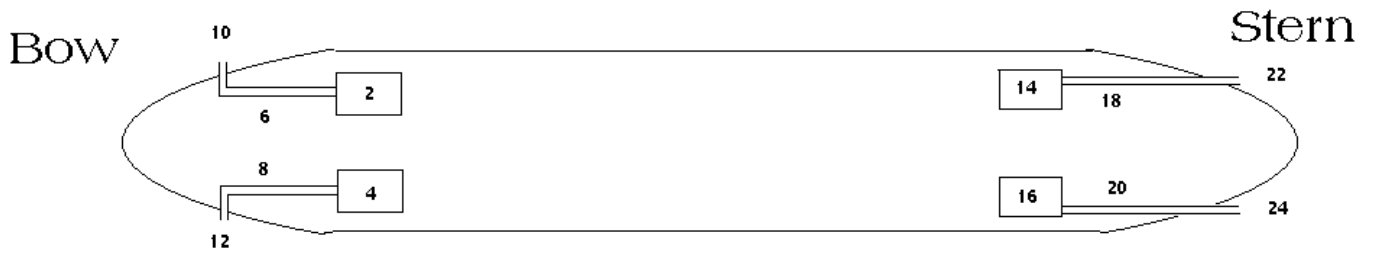


Figure 1

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# Top View of Submarine

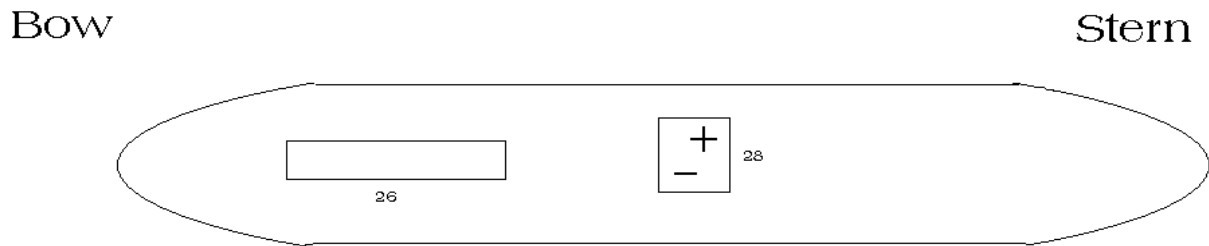


Figure 2

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# Top View of Submarine

Bow

Stern

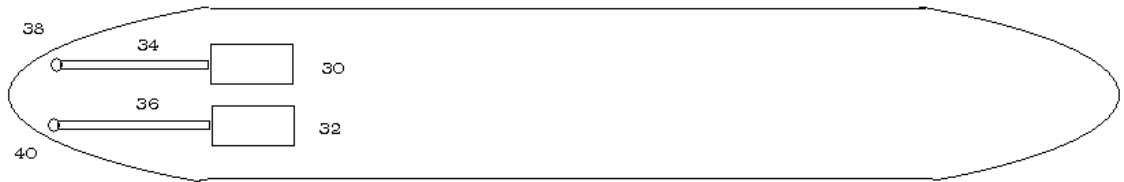


Figure 3

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# Top View of Submarine

Bow

Stern

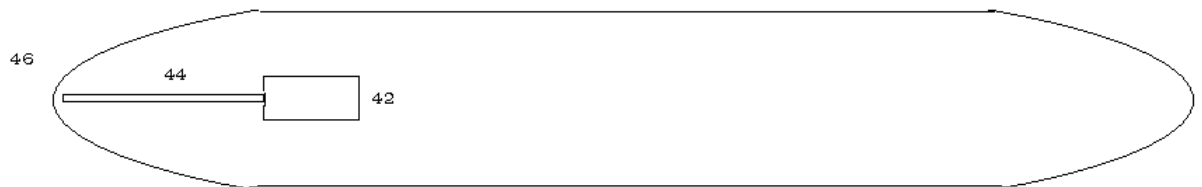


Figure 4

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# Water Tight Chamber

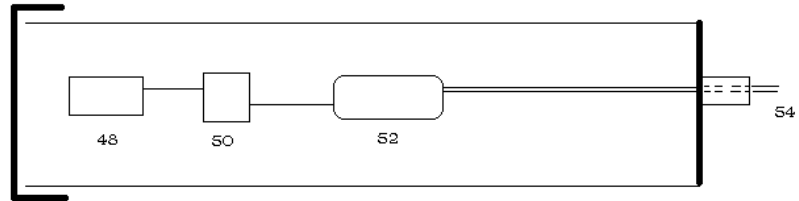


Figure 5



Picture 1



Picture 2



Picture 3



Picture 4



Picture 5



Picture 6

