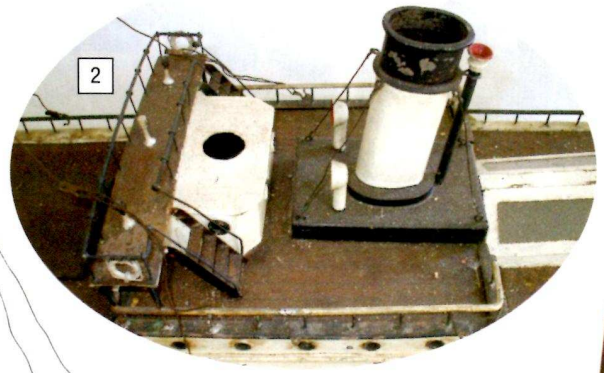

JEREMY BULL saves a model that fell on hard times

Elizabeth Morag

A Vintage Steam Yacht Restoration

This is the story of a fine model that had fallen on hard times, **Photo 1**. Originally named *Garland* as far as I can tell, it was rescued from years of sitting on a shelf in someone's garage and was essentially complete, but incapable of being steamed. **Photo 2** is a close-up of the centre section and funnel and **Photo 3** is of the stern and poop deck. Peering into the bowels of the yacht, it was evident that the burner was missing (methylated spirit perhaps?), as was the internal flue for the boiler and **Photo 4** is of the corroded rear of the boiler casing. Turning over the propeller revealed the single cylinder double acting engine had a lot of wear in the big end as there was significant slop at top and bottom dead centres.


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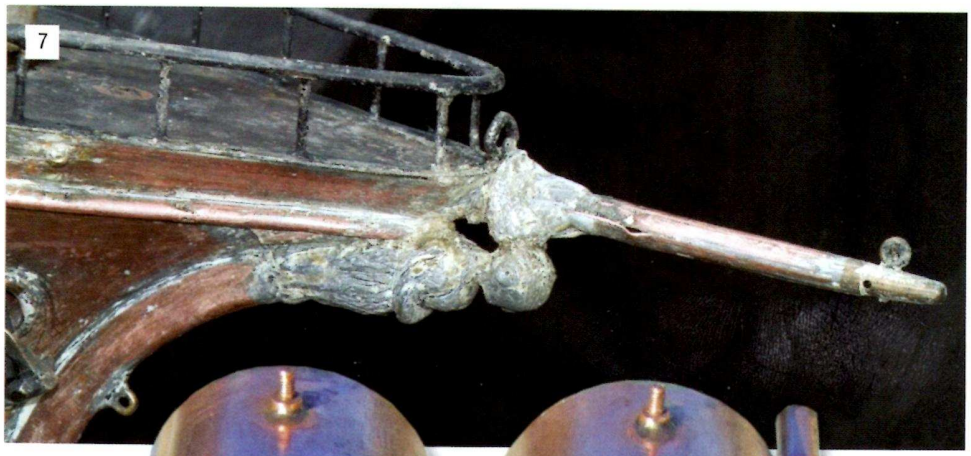
Principle dimensions:
Overall length: 50 inches (127cm)
Beam: 8.75 inches (22.23cm)
Overall height: 27.5 inches (70cm)
Draft: 4.5 inches (11.4cm)
Displacement: 44lbs (20kg)

Underneath the peeling paint after cleaning, was a copper hull, **Photos 5 & 6**, which had very fine lines and the workmanship showed the original builder was a fine coppersmith. The figurehead, **Photo 7**, also demonstrated the skill of the builder. The upperworks were all mainly of tin, with the decks painted to resemble dark teak. Some of these upperworks were a tad rough, which perhaps indicates that someone else had worked on the model at some period in its past.

Removal of the boiler unit revealed a set of studs in the bottom of the hull which served no useful purpose. The associated soldering was poor and out of character when compared to the standard of the rest of the hull which made me think that the existing boiler was a replacement, as it is very large for the size of engine. Later endurance testing on the restored boiler on one filling has turned out to be well over an hour at moderate speeds. Perhaps the rough platework mentioned earlier was as a consequence of modifications by an owner (other than the original builder), when trying to accommodate this boiler in the restricted space as it is an extremely tight fit in the hull.

The origins of the model are unknown to me, other than the name on the stern was *Garland*, the Port of Registration was Dundee and the previous owner was a Dr. Buchanan, late of Dundee, but he did not build it and I am sure of that. Close examination of the hull interior and undersides of the platework failed to reveal a builder's name anywhere. I recall some years ago in the magazine 'Old Glory,' a reader's letter enquiring if anyone knew the origins of a hull in their possession and the photo looked similar, but as far as I could tell there was no reply in subsequent issues. It has since been suggested to me that the model could have been a Caledon Shipbuilding & Engineering Company apprentice project, but who knows?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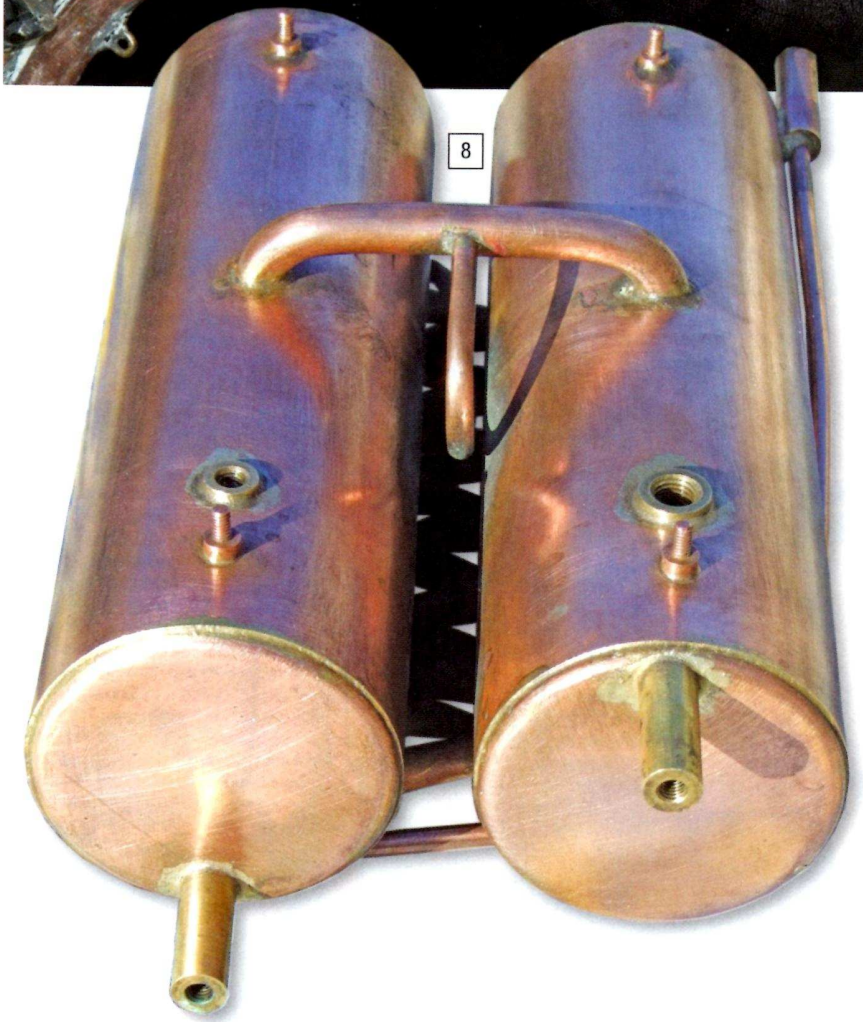
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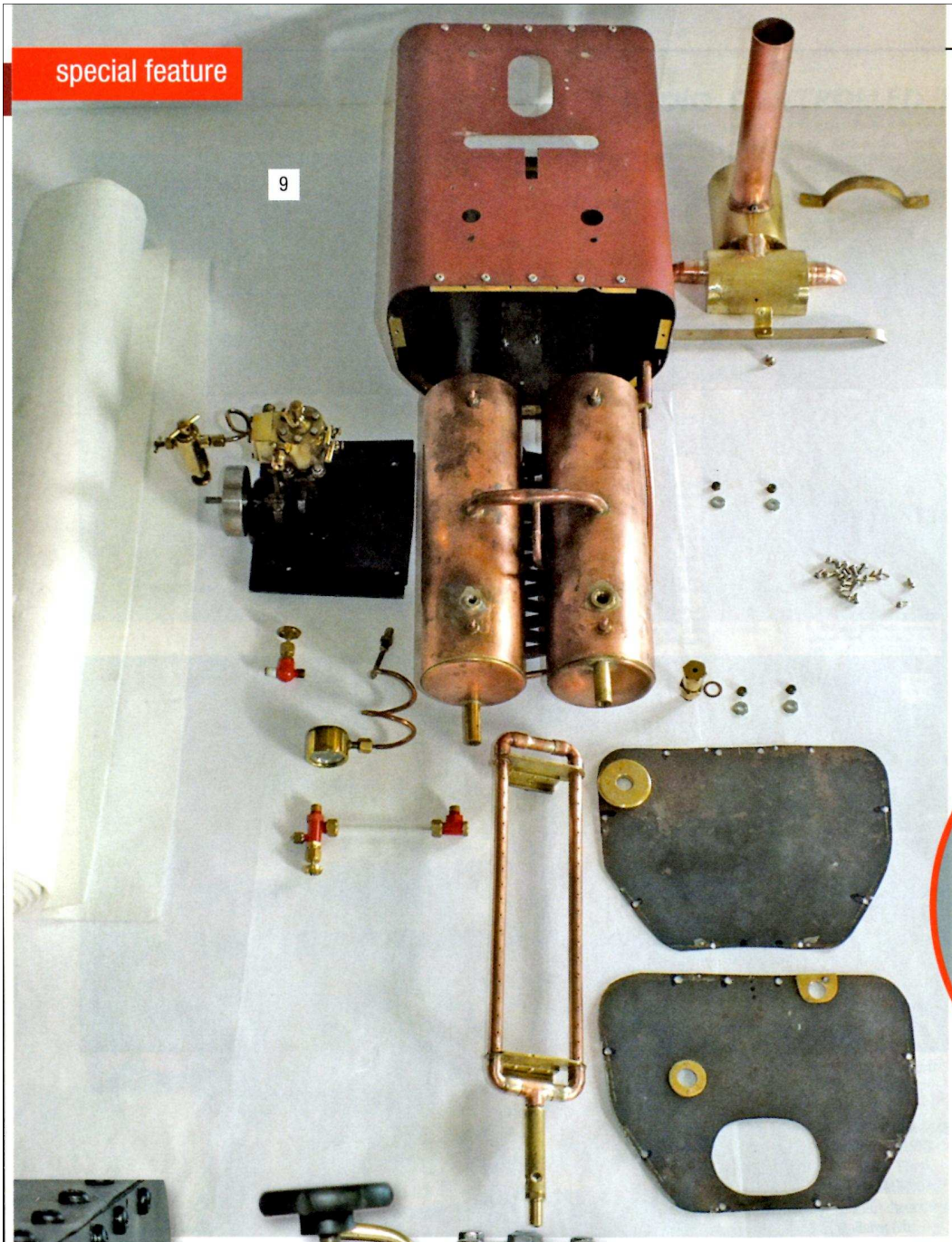
Restoration

Steam plant

This commenced with renovating the twin drum boiler, **Photo 8**, its casing, flue, a new burner, the engine itself and all the other



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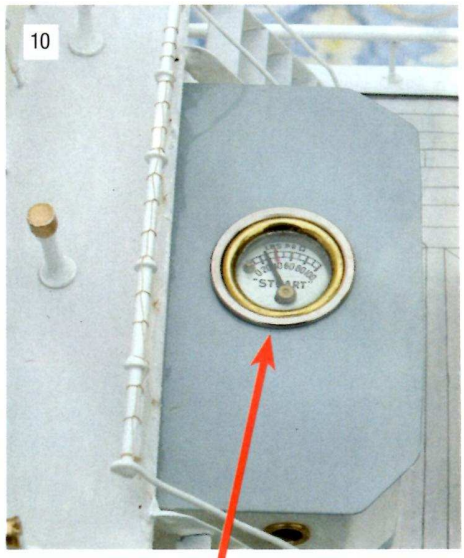

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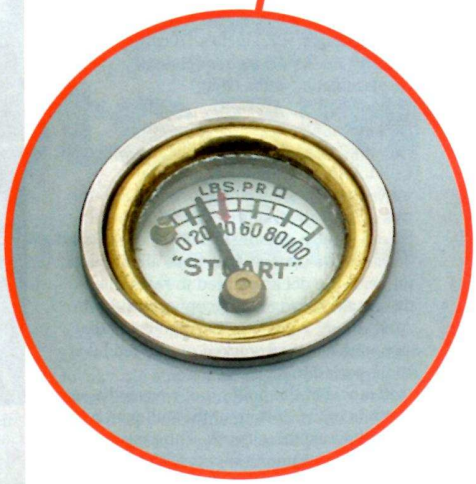

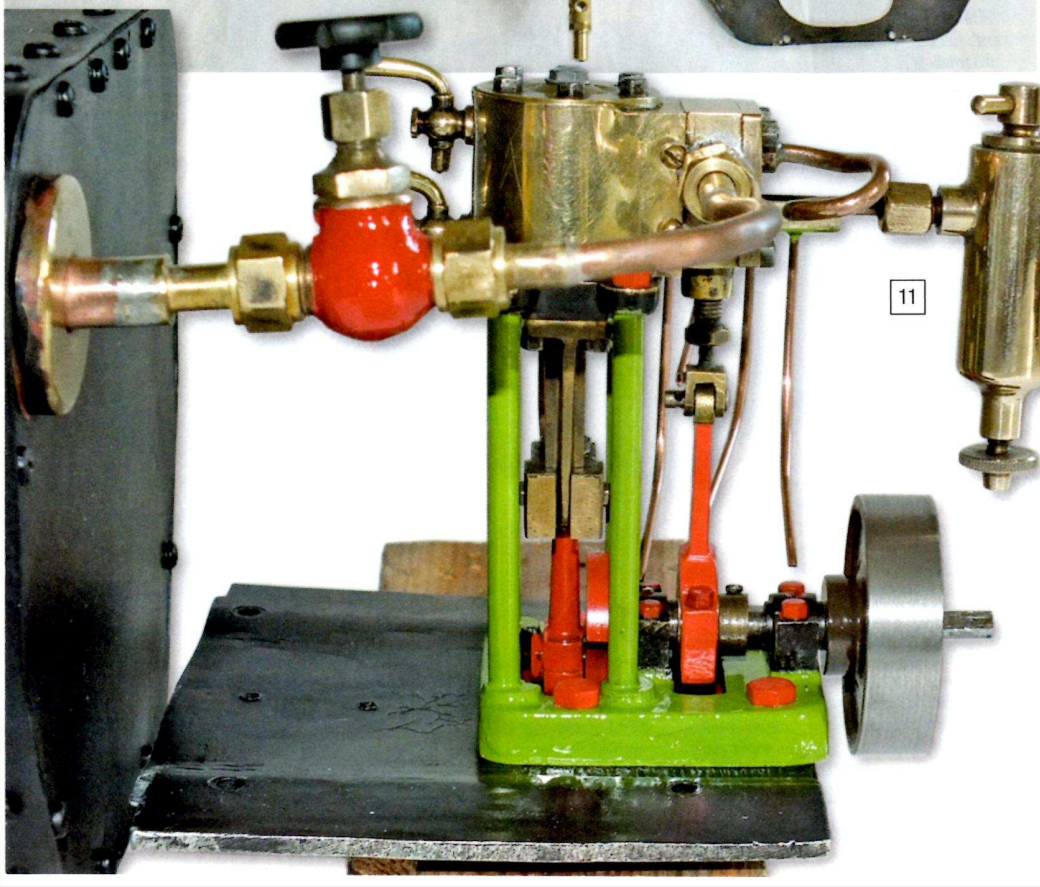

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components, **Photo 9**. Due to its age, the boiler had been lagged with asbestos and so I had it decontaminated, cleaned and renovated properly by professionals. After that it required a hydraulic pressure test and steam testing in order to obtain a boiler certificate from my local model engineering club. Working pressure was now set at 40psi and the original Stuart Turner pressure gauge was calibrated against a master gauge and it works fine, **Photo 10**.

The steam engine required a new big end bush, the piston ring replacing, plus the piston and valve glands re-packing, **Photo 11**. On the cast iron flywheel I noticed a lot of lead on one side of it. Perhaps an attempt at balancing? Well yes, but not for the reason I expected! Running the engine revealed it had a quite violent vibration and close examination of the flywheel revealed that the machinist had managed to bore the hole for the crankshaft off-centre and the lead was a poor attempt to rebalance it. Not unsurprisingly, the flywheel was scrapped and another made which this time turned true.

Burner

For this, I decided that gas would be the cleanest solution. A double poker type was designed and made using small bore central heating fittings and tubing for the poker, whilst I made the gas jet and mixing tube,


12


13

Photo 12. The final diameter of the poker holes was determined by testing with the boiler. These were eventually optimised at 1.9mm diameter which gives sufficient 'oomph' to maintain pressure at about 30 to 35psi with the engine running at a speed to realistically propel the yacht, but without wasting steam and gas by 'blowing off'. However, it must be said that the final hole size was determined after practical on the water steaming trials subsequent to this last picture.

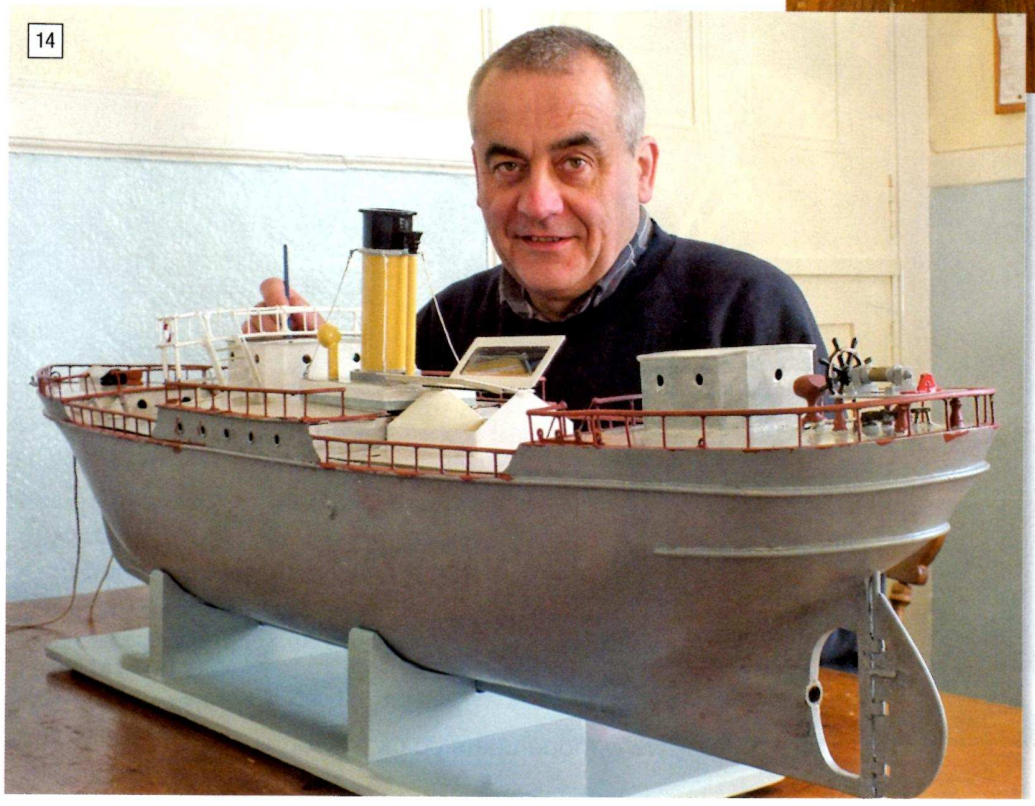
Hull

The original paint on the hull was removed using Nitromors (please see Photos 5 & 6 again for the beautiful copper hull) together with much elbow grease, whilst the fittings were easily stripped in the engineering club's grit blaster, which is a most useful item to have in the workshop and saved hours of work. In its stripped state the hull looked superb and I did consider whether or not it could be left below the waterline with its copper finish. In the end it wasn't, as I was not confident of finding a varnish that would prevent the copper from tarnishing underneath and then looking dreadful, but worse would occur if fingerprints were left on the hull which later tarnished through protective clear finish.

The hull's interior was also thoroughly cleaned and painted as in **Photo 13**. A nicely painted inside of a model boat hull looks so much better than it just being left bare and unpainted.

The hull exterior was initially painted with an etch primer from Phoenix Precision Paints and then undercoated and finally top coated with ICI Dulux gloss paint. About a fortnight was given for the paint to harden off fully before the hull was turned upright and placed back on its stand, **Photo 14**.

The biggest nightmare was getting the waterline correct. Originally the hull was put in the bath with added weights to represent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the steam plant and upperworks. The waterline was marked 'plus a bit' and painted, but when the model was completed and tried in the bath for final ballasting prior to steaming trials, the waterline was now too low! So, no choice then but to re-mark the waterline and to repaint the antifouling which was bit of a chore.

Decks

There was still much work to be done on the upperworks, including repairing and repainting the railings, skylight, bridge deck etc., **Photo 15**.

The decks were originally painted a dark brown colour to simulate teak and the deck planking drawn on with no attempt at a planking plan. When it came to repainting these decks, I decided to paint them in a silver grey colour to better match the weather worn appearance of teak planking after exposure to salt water and sunlight, for which the colour chosen was Dulux Potters Clay 3. Planking was marked out in the Admiralty pattern with an HB pencil and then the whole lot over-varnished in clear matt, **Photo 16**.

15

Re-assembly

With the upperworks completed, the boiler and steam engine could be re-inserted into the hull and plumbed, **Photo 17**. As you can see, the twin drum boiler and its casing is a tight squeeze and is, I should imagine, not the original 'as built' unit. Additional work included constructing an oil and water trap and piping the exhaust up the funnel. The safety valve was also piped to expel via a tube behind the funnel. This looks more realistic than having excess steam roaring out through open portholes giving the impression of a major boiler catastrophe or a medieval dragon! Bezels were also made to tidy up the holes around the pressure gauge and the main throttle valve where they projected through the deckhouse and deck respectively as was shown earlier (please see Photo 10 again).

Near disaster!

Before commissioning trials took place on Stobsmuir Pond in Dundee, it was back to the bath with the model fully provisioned for a voyage, including a full gas cylinder and three quarters of a glass of water in the boiler for final trimming. What a shock I got when the model listed first to port and then with a 'lazy roll' first righted itself and then listed to starboard. The addition of ballast seemed to aggravate the problem, so much consternation all round!

Removal of the gas cylinder made little difference, but

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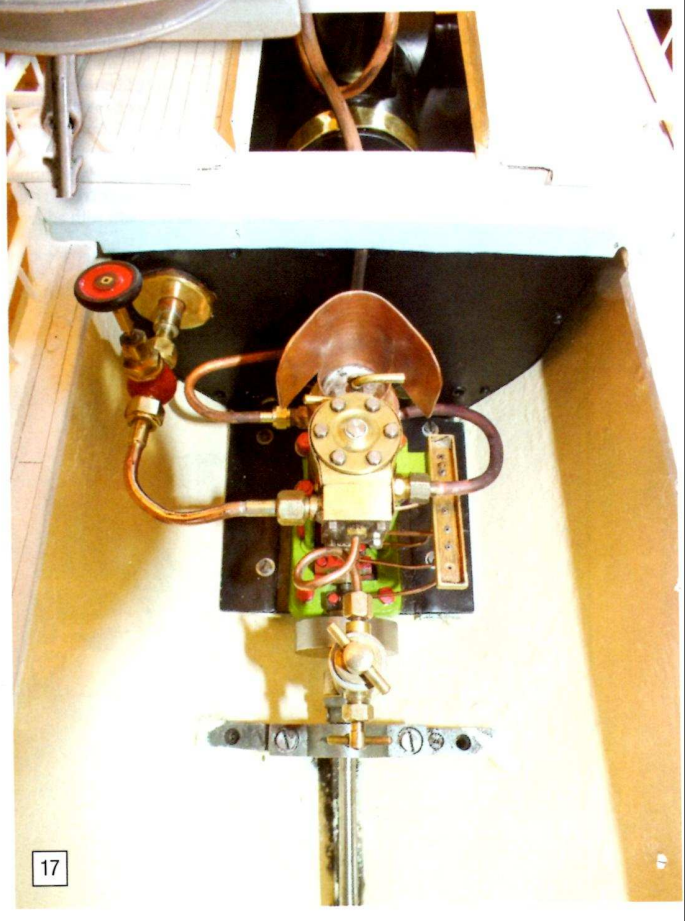

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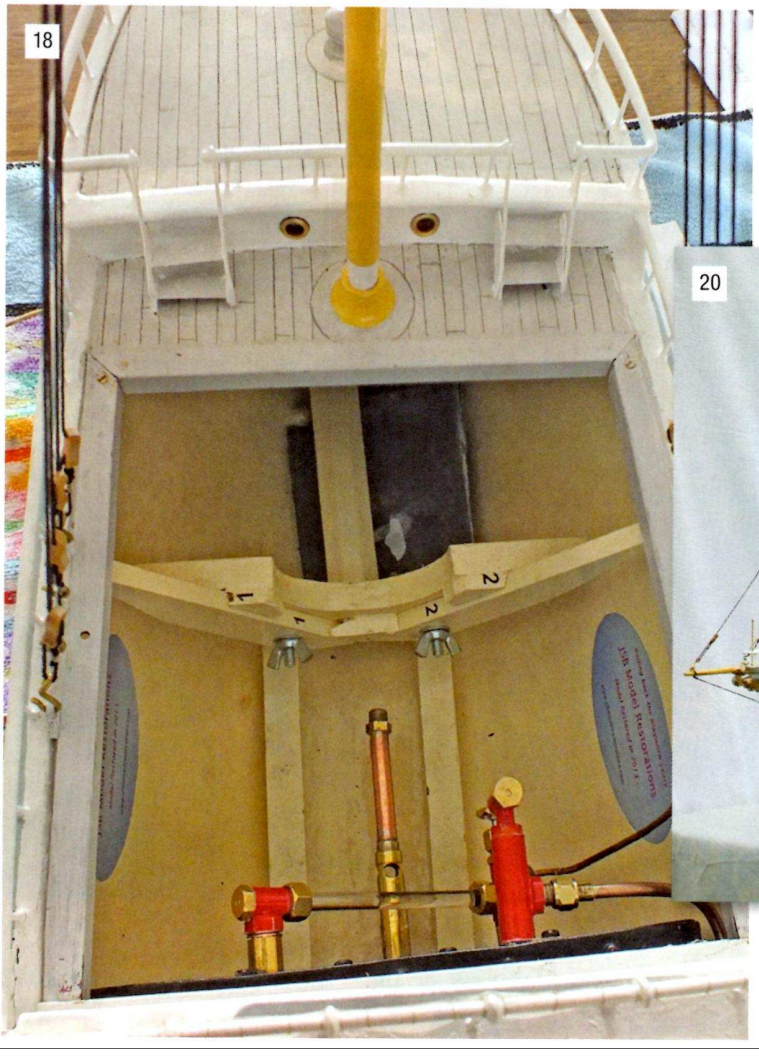
eventually after trial and error with different lead weights and their positions low in the hull, a 'sweet spot' was found, **Photo 18,** looking forward to the bow (note the lead in the hull bottom), and the 'lazy roll' was basically cured. Now she sat properly and if a roll was induced, the model righted herself very quickly and seemed to stay there. Phew! The last thing I wanted was a static model after all the effort.



Completion and trials

Why is the model called *Elizabeth Morag*? Well, **Photo 19** should give you a clue!

To finish the model, the rigging plan and mast paint scheme was copied from the steam yacht *Medea,* which is preserved in the USA. The benefit of this, is that it keeps the forward and engine room hatches clear for ready access to the burner and the steam engine during operation without the need to dismantle any rigging. The addition of two ship's boats and davits finished off the boat deck quite nicely as in **Photo 20**. One nice original feature is the opening skylight over the engine room which serves to let some of the condensation escape, but also enables one to see and check the engine


21

and propshaft in action. **Photo 21** is of the model separated from it superstructure components and this also shows the final internal arrangements very nicely.

As the model was built before the advent of radio control and none was installed during this restoration, this means setting the rudder, relying on luck, the wind and tide, and finally the bit of string tied to the model's stern!

Stobsmuir Pond in Dundee, **Photo 22**, is ideal for initial trials, as it is a large area of water unencumbered by islands, reeds or weed, which therefore provides plenty of room for an erratic helmsman. My friend Ron came along to help, **Photo 23**, but was not keen on falling in the water and this first trial was before the model had been rigged.

This maiden voyage was not an unqualified success in that it revealed the burner lacked the power to sustain the boiler pressure for very long and that was in spite of the exhaustive pre-operation workshop testing. All of which goes to show that sooner or later, as with all things, a practical working test has to be undertaken. On the other hand the model was trimmed perfectly and it didn't roll or sink, plus I didn't fall in the water either. However, subsequent opening out of the burner jets has now cured this problem. **Photos 24 and 25** are of Elizabeth Morag underway following the burner modifications and completion of the rigging, albeit on the end of a piece of string as the model is not radio controlled.

Conclusion

This model has been a lot of fun to restore and one cannot but have the greatest admiration for the metal worker who originally built this model. The challenges in the restoration work overcome along the way are themselves very rewarding and of course the owner usually ends up with an unusual model.


22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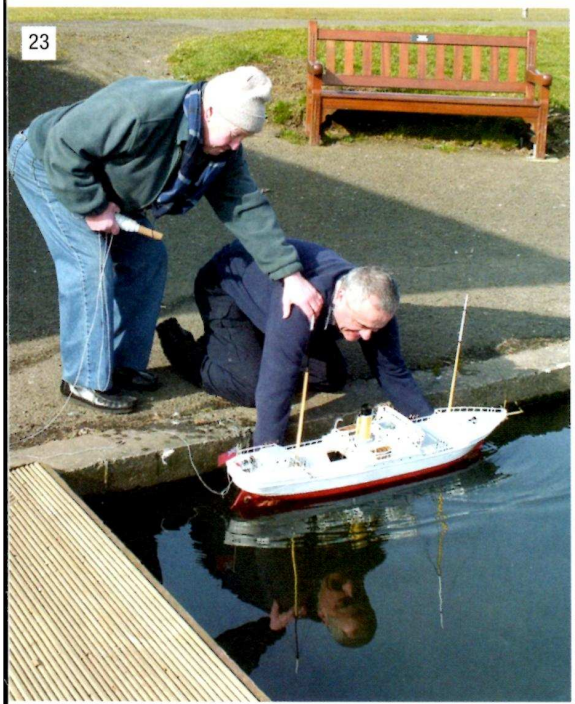
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25