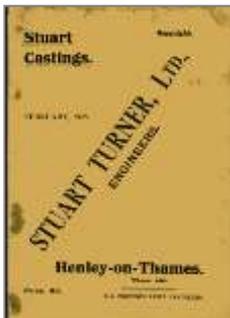




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“Stuart Turner Models”

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In the last few years I have started to collect and build stationary engine models of various types, but particularly those made by Stuart Turner (now called Stuart Models). This has come about due to my not being able to handle larger models any longer.

I built a Stuart 10H some 40 years ago when I first joined W&DSME and have always liked them. I also acquired (I think at the Guildford Society's Show, in the early 1980s) a finished S50 Mill engine probably built from a machined kit. This was on sale on one of the trade stands at what is now considered to be a very reasonable cost for a finished Stuart engine. I seem to remember paying in the region of £20.00 for it.

As my interest has grown I wanted to know more about the history of Stuart Turner and their engines, and after speaking to our member Keith West who has a number of Stuart engines and is very knowledgeable regarding them, I thought I would try and compile a short article about Stuart Turner the man and the also company as well as the engines which they have produced over the last 118 years or so.

Stuart Turner was born in Shepherds Bush in 1868, very little is known of his early years. As a young man he obtained an apprenticeship at a Clyde side engineering company that build marine engines, this was probably where he became interested in steam and internal combustion engines. He then spent some time at sea and then worked as an engineer on the island of Jersey helping to install electricity generating plant. Due to his experience with this plant in 1897 he obtained a position of engineer at the Shiplake Court estate near Henley on Thames.

In order to have electricity, large houses in those days needed generating plant of their own as there was not yet a national grid or even a local grid in many areas. They then needed someone on site to manage this plant. It was when he worked at Shiplake Court that Stuart designed and had cast the parts for his first steam engine which he later called the Stuart No.1 (Castings for this engine are still produced today).

When he had built the engine he exhibited it at a local model show, he then approached Percival Marshall the editor of the Model Engineer magazine who wrote an article about Stuart Turner and

his No.1 engine. Due to this article people started to request castings for the engine and so Stuart set up the Stuart Turner business in 1898, this was very successful and in 1903 his friend Alec Plint whom he knew when he worked in Jersey joined him in the business. Alec Plint went on to design several of the engines including I.C. engines and small generating plants which the company produced before during and after World War One. The company was incorporated in 1906 and extra staff were taken on.

In 1907 the Stuart Turner company moved to a rented premise in Henley on Thames and in 1917 moved to Broadgates Inn in Henley where the now separate Stuart Turner Pumps business is still based.

Before WW1 Stuart Turner produced model steam engines of various types, gas engines and a lathe, they also had the contract from Charles Day Manufacturing Ltd. of Shoreditch to build 162cc two stroke engines for their Dayton motorised bicycle (motorcycle). 20 engines a week were built at the peak of production; the cost of this machine was about 25 pounds in 1914. This motorcycle first went on sale in 1913, unfortunately the outbreak of WW1 the next year disrupted this project somewhat and production ceased in 1915.

In 1911 Stuart Turner had designed their own motorcycle this did not go into production but in 1912 they started to market the 'Stellar' motorcycle which had a twin cylinder in line water cooled two stroke engine with shaft drive, the capacity of the engines was about 750cc. The machine was similar to the Scott motorcycle which although it had a smaller engine (532cc) was cheaper and more popular at the time and so only 26 Stuart machines were ever built.

In 1914 Stuart Turner produced generating plant for Ernest Shackleton's ship the 'Endurance', and during WW1 Stuart Turner produced gas valves, a 'Klaxon' horn for warning of gas attack and nuts and bolts, all mainly on Government contracts. The workforce grew to 300 men and 100 women.

Shortly after WW1 Stuart Turner started to produce the P3 two stroke engine which was designed by Alec Plint for use in small generating plant and for marine use. This engine became the basis for a whole family of engines over the interwar years.

Steam models continued to be designed and castings made in their own foundry. Very popular were the complete steam boats the 24" Henley and the 39" Isis powered by the ST and Star steam engines driven from a flash steam boiler. (The Henley is once again going to be produced to order but of course with a modern steam plant). Further Steam engines and internal combustion engines for various applications were built including what at the time was the world's smallest commercial diesel engine, the type H, they were mainly sold to the RNLI for battery charging.

Stuart Turner himself left the company in 1920 and went to South Africa. little is known of his reasons for going to South Africa or what he did there, he returned to live in Southend and died there in 1938.

During World War Two Stuart Turner built components for portable generating plants of various types including a version of the 'Sirius' steam engine for use in the 'Firefly' generating set which was used by troops and resistance units operating behind enemy lines to power radio transmitters and charge batteries, more about this in Part 2. Later in the war the Mk 814 set was produced this used a specially designed single cylinder piston valve engine.

Also, generating sets powered by internal combustion engines were built for the RAF to charge aircraft batteries and to power dummy runway lights on fake airfields. Further to this the P5XC internal combustion engine powered generating unit was used to power a Zwicky pump mounted on a AEC fuel bowser truck to refuel aircraft. Later versions of the P5 were used in generating sets until a two new engines the P6 and P66 were introduced in 1969.

After WW2 Stuart Turner produced marine engines both as diesel and petrol types, and also marketed the small diesel engines from the Spanish based Sole company as the Stuart Sole. These were mainly used to power fishing boats, marine engine production ceased in 1978.

In 1987 Stuart Turner Ltd bought Morewood Model Engineers and Stuart Models moved to Cheddar. Somerset. Cheddar Models Ltd. was formed as an offshoot of the company and in 1990 Stuart Models was sold to Jones and Bradburn. The business moved again, this time to Guernsey in the Channel Islands.

When Cheddar Models went bankrupt in 2005 its plans and designs were absorbed back into Stuart Models. The Plastow traction engine range was acquired and then sold to Bridport Foundry in Dorset who had been producing their castings for them; in 2012 the Bridport foundry purchased the entire Stuart Models business. They are continuing to expand the range of steam engines and other models, bringing back some of the older and more unusual models from the past.

In recent years the company has invested in CNC machinery to enable it to produce the models both as machined kits and in ready to run form.

In Part Two of this article we will look in more detail at some the steam models which have been produced over the last 118 years by Stuart Turner.



PART 2. THE STEAM MODELS

This time we will look at some of the steam powered models designed and supplied by Stuart Turner/Stuart Models over the last 115 years or so.

As mentioned in part 1 of this article the first steam engine available in the form of castings etc. for the model engineer to build was the **Stuart No. 1**. This is a vertical type engine and is quite large, having a 2" bore and stroke and is about 14" high with a 7 1/2" dia. flywheel. It has a crutch and pillar frame to support the cylinder and can be fitted with reversing gear and a feed water pump. There was also a **No. 2 engine** which was a high speed short stroke version of the No.1 engine, this was discontinued in 1920 and is now very rare indeed.

No. 3a engine. This is a twin cylinder vertical compound steam engine with bores of 1 1/4" and 2 1/4" and a stroke of 1 1/2". This engine is once again available as castings. A twin cylinder version was also once available, this may be produced again in the future.

No. 4 engine. This engine is another vertical type it has 1 1/2" bore and stroke with a 5" dia. flywheel. The engine has a trunk type crosshead guide and stands 10" high. It can be fitted with a solid high speed flywheel. It is still available in castings only form. The engine uses some of the parts of the No. 9 engine.

No. 5a engine ('Cygnet'). This engine is the largest single cylinder vertical steam engine made by Stuart. It has a bore of 2 1/4" and a stroke of 2". The flywheel is 7" in dia. it stands 15" high. The engine is also available as a twin cylinder model this is known as the '**Swan**' which is two 5a engines mounted on a common bedplate, these engines are often used in boats when a disc type flywheel is usually fitted. Both the single and twin can be fitted with reversing gear. They are both capable of powering a passenger carrying boat of up to about 20ft in length.

No. 6a engine. This is the largest steam engine still produced by Stuart Models. It is not really a model though being a vertical twin cylinder compound (high and low pressure cylinders) with bores of 2 1/4" dia. and 4" dia. and a 3" stroke it stands 20" high and is capable of powering a large passenger carrying boat as 4HP is produced by it.

No 7a engine. This engine is a vertical single cylinder type having a trunk crosshead guide and a bore and stroke of 1" dia. It can be fitted with reversing gear.

No. 8 engine. This engine is a horizontal single cylinder type with a 1" bore and stroke. It uses many of the parts of the 7a, since the 1960s they have been supplied with the trunk type of crosshead guide. Earlier engines had a slipper guide and were slightly smaller in some ways, the parts are not all interchangeable though so the current engine perhaps should be designated as 8a.

No. 9 Engine. This engine is considered by many people to be one of the most desirable engines in the Stuart range it is a single cylinder horizontal mill engine type.

It has a bore and stroke of 1 1/2" and a 4" dia. flywheel, the crosshead guide is of the slipper type. The engine can be fitted with a working governor and a feed-water pump. It is a very powerful engine for its size. It can be bought as a set of castings, a machined kit or as a finished engine.

No.10 series of engines, there are four engines in this range, they all have a bore and stroke of 3/4" and a trunk type crosshead guide. They all have a 3" dia. spoked flywheel as standard. Many of the parts for these engines are interchangeable. All the engines in the range are sold as either a set of castings, a machined kit or as a finished engine.

10 Vertical. This is a single cylinder vertical engine which can be fitted with reversing gear, this is the most common of the Stuart engines.

10 Horizontal. This is a single cylinder horizontal mill engine.

D10 Vertical. This is a twin cylinder version of the 10V, often used to power model steam boats. When used as a marine engine it is usually fitted with a disc type flywheel.

Score. This is a twin cylinder version of the 10H, this engine is the least common of the 10 series engines.

S50 mill engine. This engine has been produced for many years virtually unchanged except for a change some years ago from bronze for the cylinder and steam chest castings to cast iron castings. The engine is of the horizontal mill type and is of fairly simple construction. These engines are produced as a set of castings, a set of machined parts or as a finished engine.

We now come to a series of six engines which are post 1960 in design; these engines use many common cast parts.

Stuart Beam. This engine is a central column style beam engine with Watt's parallel motion. The cylinder is of 1" bore and 2" stroke, the flywheel is 7" in dia.

Half Beam. This is a 'Grasshopper' type beam engine, flywheel, cylinder dia. and stroke as the beam engine mentioned above.

Real Steam Engine. This engine is a much simpler type than the previous two described. It is an overcrank engine which is based on some colliery types. It stands about 15 1/2" high and once again uses the same cylinder as the engines already described.

Part 3 The Models contd.

Peter continues his description of some of the huge range of models produced by that famous company well known to most of us.



Victoria. This is a larger mill type horizontal engine once again using the modular cast parts.

Twin Victoria. This is the twin version of the above engine, it has a large centre pulley type flywheel which has a double row of spokes.



James Coombes. This engine is based on an engine which worked at a Bristol colliery. It is a table type steam engine with the cylinder mounted over the crankshaft. It is a very nice design particularly when fitted with a working governor. It stands 14¹/₂" high.



Major Beam. This engine is a large centre column beam engine based on a model published in the Model Engineer magazine in 1914, the bore is 1³/₄" dia. with a 3³/₄" stroke. It has a 13⁷/₈" dia. flywheel and is 18¹/₄" high. It is a superb model when built well but very heavy!

Williamson Steam Engine. This engine is based on a fluted vertical column design originally built by Williamson's of Kendal, Cumbria. It has a bore of 5/8" dia. and a stroke of 1¹/₄" and is a very nice looking model.

Twin Launch Engine. A twin cylinder launch type marine engine the cylinder block is supported on five columns, the bore of the cylinders is 1" dia. with a 7/8" stroke. Usually a disc flywheel is fitted along with reversing gear. These engines are intended for use in large model steam boats and are often mounted on I beams as full size practice.

Compound Launch Engine. This engine is the compound version of the twin cylinder launch marine engine. The bores of the cylinders are 1¹/₄" dia. and 3/4" with a 7/8" stroke.



Triple Expansion Engine. This is the most complex of the steam engines produced by Stuart Models. The cylinders are high pressure 3/4" dia. bore, intermediate pressure 1¹/₄" dia. bore and the low pressure is 1³/₄" dia. bore, all with a 1" stroke. It is normally fitted with reversing gear and can be also have a condenser as well.

Stuart Turner once produced a series of enclosed crank steam engine designs; they were called the MTB series and were principally meant for model boat use. I will only describe the later three of them here though.

Star. This engine has an aluminium body casting for lightness it was introduced in 1926 for the 'Isis' steam launch which Stuart Turner built at that time. This was only available as a finished engine, it had twin cylinders 5/8" dia. bore and stroke. Drive was by bevel gears and it had a piston valve. The engine was discontinued at the start of the Second World War, it is now quite rare in good condition.

Sun. This engine introduced in 1927 it was like the Star but with a bore and stroke of 3/4". The engine like the Star was popular in the late 20's and 30's for use in racing flash steam hydroplanes. It was produced until the late 1980's. We may well see it's castings on the market again at some time in the future.



Sirius. This 1938 design of engine is a larger and more powerful version of the Star and Sun models. The bore and stroke are 1" dia. once again it has an enclosed crankcase with splash lubrication and a piston valve with bevel gear drive. It is rated a 1/3 hp at 2,800 rpm and 80psi. and weighs 6½ lbs. the engine was used in the 'Firefly' generating sets in WW2. The engine is still available as a set of castings although in a slightly simplified form to the WW2 model.

Stuart BB. A single cylinder enclosed motion vertical high speed steam engine. This is engine another of the types for use in flash steam hydroplanes which were popular before WW2, the crankcase is cast aluminium and it is fitted with a single sided ball bearing crankshaft. The engine stands 5" high the bore is ¾" dia. and the stroke ⅝". This engine is now quite rare in good order as due to its high-speed capability it can often be found only in worn condition.

Progress. These engines were available in 1920s and 1930's as a range intended for the modeller to build on a small lathe, the cylinder came already bored and faced. There were five engines in the range, Stuart models have now reintroduced the Horizontal Oscillating version.



Steam Hammer. A 1/12th scale model of Rigby's patent steam hammer; this is one of the more unusual models in the Stuart range and an excellent finger nail trimmer! It stands 13" high.

Part 4

In this short article I am going to talk about buying, building and refurbishing steam models from the Stuart Models range. This is mainly aimed at those new to model engineering.

Firstly, I should say that you do not necessarily need to have any workshop machinery to build a Stuart model as some of the engines are available as fully machined kits. All that is needed are some hand tools and paint etc. to complete the model. The parts are very well machined and only need some fettling etc. However, taking this route is costly as compared with building the engines from the castings. The prices for these machined kits start at £180.00 plus VAT and go up to about £1,700.00 plus VAT.

The single cylinder engines from the 10 Series range, plus the Progress or S50 are the most straight forward ones to build. Also, there is a very good booklet available showing how to go about tackling the building of the V10 model. Stuart casting sets start at £42.00 plus VAT for the single cylinder oscillating engine and go up to around £1,995.00 plus VAT for the largest No. 6A engine.

Some of the kits come with all the materials to finish the engine and some do not, although fixings are usually included. Fittings such as draincocks, steam valves, lubricators and oilers are extra though. The Stuart Models website shows most of the items that are currently available and what exactly is included in each kit.

Another route you can take is to look out for part built or finished engines on websites such as eBay or Steam Engines for Sale. You do have to be rather careful doing this though, as there are quite a lot of overpriced items and also some junk out there. Having said that I have bought some very nice engines on eBay at very reasonable prices. (I would be quite willing to have a look online at anything advertised which may take your eye if you are unsure.) I should also mention that the some of the smaller models in the Stuart range have been copied in the Far East, these are relatively cheap but are of very poor quality and should be avoided.

I have bought engines which turn out to need more work than I at first thought, but have not yet been landed with any junk! The most notable one was a No. 4 which for some reason had the cylinder 1/8" short at one end. This was corrected by making up a 1/8" thick iron spacing ring.

There are also engines advertised which are just in need of refurbishment and painting. If you are lucky this can be work out very well. Spare parts both machined and unmachined for the many of the current engines in the range are available individually from Stuart Models if they are needed.