

## APPENDIX 8 - Francis Mountain's memoir

This is reproduced from a copy held in the SMR 2397 documentation, and also several copies exist in the archives. The name of the person who made the transcription is not known. Their statement that the original is in the Bristol Museum was checked, but could not be confirmed by the Museum staff.

“In 1915, at the age of 72, Francis Mountain wrote an account of his time at the Nailsea Glassworks. This paper is now in the Bristol Museum and I quote it below, in its entirety, as a first hand record of an industry and way of life which existed a century ago.

"HISTORY OF NAILSEA GLASSWORKS"  
Written by Francis Mountain, one of the  
glassworkers, when seventy-two years -of age.

Nailsea Glass Works are about eight miles from Bristol, and one mile from Nailsea station. Three large cones were erected and furnaces built inside for melting the metal. The first house was on a smaller scale than the others and was named the Lily; it was the Plate house and only plate was made in it; the furnace held four pots only.

After the metal was melted it was taken by two men in ladles to a long table, some 30 or 40 feet in length; the metal was placed in front of the roller and drawn over by two men, the wheels working in cogs in the table. After the roller had passed over it, it was drawn on to a pair of wheels faced up with plaster of Paris and conveyed to the annealing kiln. When the kiln was full it was closed up for a little while until the metal was cool enough to handle and be taken to the warehouse. About four kilns were used in the Plate house.

The pots were made upon the premises with the best fire-clay from Stourbridge, and made by hand. When made and dried for a few months, they were taken to a pot arch and gradually heated until burnt very hard; they were then ready to be put into the furnace.

The bricks used for the crown of the furnace were obtained somewhere in Wales - these would not run but would glaze over so that not much could drip into the pots of metal.

The pots were about 5 feet in height, 3-4 inches in thickness and about 70 inches across from brim to brim. When empty in the furnace they are filled full up, then melted down, then after about six or eight hours filled again and melted down again.

The next house is called the Old House. Between fifty and sixty years ago, on account of the foundations being insecure, it was found necessary to take part of this cone down about half-way and re-build it again. This furnace would hold eight pots, and both Sheet and Crown glass were made in it.

The Crown glass is made on a different scale altogether from the Sheet glass. Sheet glass is swung and blown at the same time until it is the required length - it is made in cylinders; when cold it is split with a glazier's diamond and taken to the flattening kiln to be made flat by a man called the Flattener, it is then piled up in the kiln.

Crown glass is made in the shape of a plate with the bullion in the centre. About fifty years ago a patent to do away with the bullion was tried, but this proved a failure.

Fluted glass was also made at Nailsea, oval and round shades, jugs, decanters, fish-bowls, bottles and all kinds of fancy work. Cut glass was also made, then cut with sand and water and wheels worked with machinery.

Next we come to the New House - this had a large cone, capable of holding eight pots in the furnace. This furnace was from 30 to 40 feet in length and was fed with coal at each end when melting the metal

was in process. It would take from 18 to 24 hours to melt the metal fit to be blown into glass. This was a sheet glass cone only, no other kind was made.

When the pots were broken they were taken out of the furnace by a large machine on two wheels, which would raise them up and draw them out of the furnace; new ones were put in their place by the same machine. Pots last from one to three months; sometimes a pot could be mended, that is to say, turned round, and black bottles melted and placed upon an angle of iron would repair it.

The furnaces were worked underground - caves leading from one end to the other. Bars of iron, from four to twelve in number, were also used to keep up the fire in the furnace.

Surrounding the cones there were in the yard sheds for crate-making, stables, saw-mill, roller crushers, warehouses, weigh-bridge, offices, etc. All goods were taken to Bristol by the well-known vehicle commonly called the Dilley. Salt-cake was also brought from Netham Chemical Works to Nailsea, likewise coke from Bristol Gasworks; sea-sand was brought from Portishead to Bristol, then by rail to Nailsea, then dried in kilns for use.

The number of kilns in use in the factory was about thirteen, with about five pot arches. There were about ten other furnaces used for heating before the metal was made into Sheet or Crown glass.

Some sixty or seventy years ago Alkali Works were carried on in Nailsea Glass Works for the manufacture of chemicals such as salt-cake, brimstone<sup>57</sup>, acid and other things. About fifty years ago the high chemical stack at the Glass Works was thrown down by a man named Yendole, who undermined it with a pick, propped it up with wood, then set fire to it and down came the structure.

Some little distance from Nailsea Glass Works two large ponds were dug for the storage of water for the works. While digging operations were going on, a large spring of water was met with, also a large bed of valuable clay. This clay was taken to the Works, a Pottery was formed and built, and a gentleman named Paget was appointed to manage it. All kinds of articles were made, such as bricks, pipes, bends, plates, cups and saucers, and other things too numerous to mention. The work went on as long as the clay, of which there must have been several thousand tons, lasted.

About the year 1859 a fire broke out in the warehouses of the Works and did considerable damage; as they had to send to Bristol for fire-engines, the fire got a strong hold but no one was injured and no lives were lost; this was in the time of S. Bowen, Master.

About 1858 Sheet glass blowers came from France and Belgium to England, and came to Nailsea. This made no small stir but after coming to an understanding, they were allowed to start work with the English men of Nailsea as Sheet glass blowers. As regards their workmanship, it was not up to the standard of our Nailsea men. They went to live in some cottages near the Works, then called the French Row, and it is so called to the present day. When the war broke out in France they all left to fight for their country.

The ingredients for making Sheet, Crown and Plate glass were as follows:

Burnt limestone from Clevedon, slaked and sifted fine for melting purposes.  
Salt-cake, once made at Nailsea, in later years from Netham Chemical Works.  
Charcoal  
Arsenic  
Sand from Portishead  
Cullet, or broken glass, all well mixed together.

Before the Frenchmen came most of the blowers were Nailsea men. Some of the best crown blowers were:- I. Knight      I. Barnet      H. Lester      T. Raybould

Sheet glass blowers:- T. Gerrard      R. Pearless      C. Briant      I. Malcolm

Fluted Glass:- F. Mountain      G. Mountain.”

---

<sup>57</sup> [Sulphur. AFS]

## APPENDIX 9 - Frisbie's Furnace Feeder

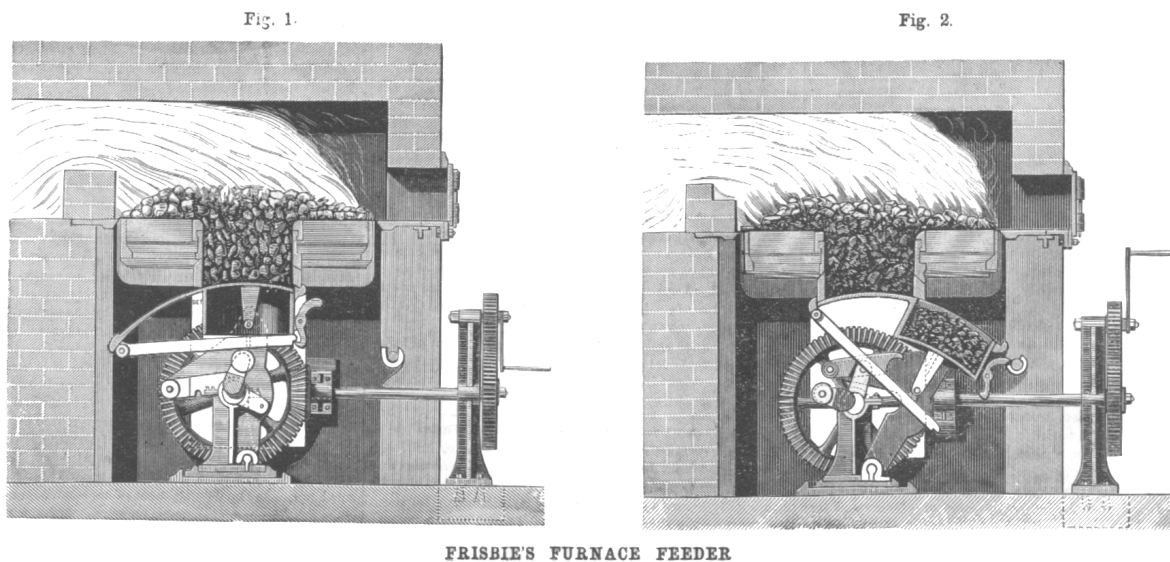
Transcribed from the *Scientific American*, Vol. XXXV – No. 23 [New Series] December 2, 1876.

### “IMPROVED FURNACE FEEDER

Years ago Dr Arnott taught us that the proper method was to light a fire from the top and let it burn downwards, consuming the gasses as they were evolved; and, in accordance with this view, he invented a domestic grate for charging at the bottom. Mr. Frisbie's patent feeder, represented in the annexed engraving, which we select from the pages of *Iron*, is designed to accomplish the same object in furnaces and the fire grates of steam boilers.

The accompanying engravings are longitudinal vertical sections, Fig. 1 showing the charging cylinder in a vertical position and with the piston raised; while Fig. 2 shows the cylinder brought back to an inclined position and filled, with the piston at the bottom. In place of the usual fire bars is a central aperture, surrounded by segmental gratings, which are easily removable, while the whole annular arrangement of grate bars runs on friction rollers, like a turntable, and may be rotated by means of a crowbar inserted in the holes for that purpose. Underneath the central aperture is hung the cylinder or hopper, swinging on pivots, and provided with a movable bottom or piston. This cylinder is supported by side plates working in bearings on the floor of the furnace, and, after being filled in the inclined position, is brought up to the vertical by one set of arms and crank pins on the crank shaft, taking into notches in links jointed to the supporting plates. The crank shaft is driven by means of the hand winch and bevel gearing, and when the cylinder has reached the full extent of its swing, which brings it directly underneath the central circular aperture, the crank pins leave the notches, and the links then rest upon the shaft, thus locking the hopper in a vertical position. By a continued turning of the winch handle, the crank of the shaft, which is provided with a friction roller, now comes into contact with another set of arms on the shaft, which raise the piston with its charge of fuel to the top of the cylinder, thus causing the fresh charge to displace the previous one (shown at Fig. 2 [Figure 3.33, below]), and propel it into the incandescent mass above. Turning the handle in the contrary direction has the effect of bringing the cylinder back to the inclined position, the crank pin of the first set of arms taking into the notches, and disengaging the links by raising them. A cast iron apron follows the cylinder up, so as to retain in its place the coal just charged into the furnace. The piston remains at the top of the cylinder until it has passed the opening in the center, when it is released by a catch coming in contact with a cross bar, and falls to the bottom of the cylinder, ready for a fresh charge of fuel.

It is claimed that, by this arrangement, the gases evolved from the coal cannot escape without being consumed; and so perfect is the combustion that nearly all the residuum forms a fine ash, which falls between the bars on their being moved round. Any clinker or incombustible substance contained in the fuel is continually lifted and loosened, and gradually carried to the circumference of the grate by the successive charges of fresh fuel forced up in the center, and may be removed from all portions of the grate by its being brought, in its revolution, opposite the fire hole door. Raking of the bars is entirely superseded, and the fire door need be opened only [on] rare occasions. Again, the stoker is completely protected from the violent heat, and has a much less laborious task than in hand stoking. There is no fear, as might at first be supposed, of the cylinder being melted by the heat; the fact is that it does not come in contact with the fire itself, but only with fresh coals. The draft through the grating also tends to keep the gear cool. We learn that there are already over thirty of the feeders now in use in Birmingham, England.”



**Figure 3.33: Frisbie's Furnace Feeder**

## **APPENDIX 10 - John M Eyres' 1911 letter to H St George Gray**

Subject: - Personal experiences in. Nailsea Glassworks

Source: - July 1911 letter from John M. Eyres to H. St. George Gray

“Having spent seven years of my youth<sup>58</sup> at the Nailsea Glass Works, in the packing rooms and office, I have naturally read your article in the June number of the 'Connoisseur' with great interest. Pray permit me to make a few remarks thereon. The large Cone, plate I, represents what we used to call the 'New' House, and to the right of it is the tall Warehouse in which the glass was cut, packed and stored. Further to the right again, in my early days, stood a very tall Chimney Stack, which became so dangerous that Mr Bowen had it thrown down. Then there were large Acid Chambers running parallel with the square in front of the Royal Oak Inn.

Nothing but sheet glass was ever made in the 'New' House whilst I was there, but, in the 'Old' House, which had a rather fuller-bodied cone and lay to the east of the New House, I saw, in the summer of 1862, many a red hot bulb whirled out into a Crown table before the 'flashing' furnace and placed with infinite care by skilful hands into an annealing kiln. I have never seen a more beautiful process anywhere than the manufacture of Crown Glass. The 'bull's eye', which I now see is being revived in modern glazing, is just the central spot of a Crown table from which the 'punky stick' was severed. I believe I am right in saying that after the Melting furnace of the Old House fell in, in September '62, no more Crown Glass was made at Nailsea during Mr Bowen's time. By October of that year the 'New' house had been got ready for making sheet glass only, and it was several years before the 'Old' house was again at work. When it resumed work, sheet glass only was made, until a little side furnace was built for one or two men to make fancy goods, such as propagators, cucumber glasses, rolling pins and glass shades.

Before work was resumed in the 'Old' house, the 'Lily' (the small Cone of which was still standing in 1907 when I paid the ruins a visit) was got ready for the purpose of making Rolled Plate Glass, a large quantity of which I remember consigning to Crewe, and other large railway

<sup>58</sup> 1862-1869 (Vincent, p.19)

stations, for roofing purposes. The ruins of another small house lay alongside the Lily, where, in former days glass was made, but what kind I could not say. I remember seeing specimens of plaited glass, similar to plate III, but never saw any made. Pipes, similar to those in plate 17, I have also seen but never witnessed the making of them. A Wagoner, from over Backwell Hill, must have heard something about them, for he came into the Works one day and asked one of the Teazers (stokers) if he thought he could find any 'Curiosity bacca pipes' among the cinders.

I never knew sand come from anywhere but Phippard's, at Wareham in Dorset, during my time there. A very decent old fellow used to bring limestone daily from Walton or Weston-in-Gordano, via Clevedon, and take 'breeze' (small coke) as back carriage, for burning in his kilns. I think his name was Shepstone.

Stonier's account of wages earned by the blowers does not tally with my experience. Of course he was there in the early '70s (seventies) with Chance Bros., so I cannot contradict him; but in '68 or '69, I had the making up of the men's wages book every Friday, and on Saturdays, to call out the amounts to the Cashier, as he paid the men; and my recollection is pretty clear that £4 to £4-10/- per week was about the highest wages the ( [something omitted here] ).

Saltcake was an important ingredient in the mixture of glass metal and that had to be fetched by the Dilly-men from the Netham Chemical Works, the further side of Bristol, after the men had delivered their loads of glass at the Quay or Railway Stations. The clay of which the huge melting pots were made came, invariably, from Stourbridge, but the making of them was done on the premises at Nailsea.

Working in such a fierce heat as the Blowers and Gatherers were obliged to, it is not to be wondered at that some of them developed an unquenchable thirst. They tried different modes of slaking it. The majority drank beer, when they could get it, but there were teetotallers, even in those days, who drank barley (or oat meal) water, and found it sustaining as well as refreshing. I can safely endorse what you say about snail eating on page 93, by English, as well as Frenchmen. As long as you get the right kind of snails, in dry condition, they are very palatable. I have eaten and enjoyed them myself, baked upon a shovel held for a few minutes at the mouth of a furnace, and taken from their shells with a two inch nail. If oysters, mussels and winkles, why not snails? On page 96 you mention James Kelly. If that is the Kelly who was there in my time he was an Irishman who came to mix metal for the coloured glass which Mr Bowen tried his hand at making - Kelly was the man who introduced the undulating-interlocking principle but, unfortunately, very few orders ever came in for those goods. He was a clever mixer, however, and would be very proud of getting you to hold pieces of his handiwork up to the light, when he would shew you what a 'foine Cathedral tint ' it was. I should have taken much more pains to educate myself in the mysteries of coloured glass, at the time, had I known then that I should, in later years, have the privilege of gazing up at the glorious windows of Exeter Cathedral, York Minster and other magnificent ( ? ) up and down England and Scotland.

No. II plate, shewing the latticino glass, is very beautiful but none of that ever came within my ken during the time I was at Nailsea.

You do not describe those two little worm like objects in plate XII, but in my day, if you wanted to be initiated into the mysteries of glass making, either of the gatherers would be ready to oblige you. He would just gather a few ounces of melted glass at the end of a 'puntystick' and drop a portion of it into a kettle of water. When cold enough he would fish it up with his fingers and offer you the thick end of it, bidding you hold tight. As soon as he found you had a grasp of it, he would give the thin end a twist, when hey, presto; you would find yourself with a