

PATENT SPECIFICATION 982,839

DRAWINGS ATTACHED.

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982,839



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COMPLETE SPECIFICATION.

Improvements in or relating to Supports for Structures.

We, SHEPHERD WOODWORK LIMITED, a British Company of Blue Bridge Lane, York, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to supports for structures and particularly for comparatively heavy structures such as huts and the like for human occupation and for use on building sites for example, portable silos for the storage of material such as cement, transportable equipment e.g. concrete mixers, water tanks and other containers of a comparatively massive nature, all of which will hereinafter be referred to as "structures".

It is an object of the invention to provide a support for a structure, or a structure furnished with a number of supports, of such a kind that the elevation of the structure from the ground or other supporting surface may be adjusted when desired, and also in which the loading or unloading of the structure on or from a lorry or other conveyance is facilitated.

According to the invention there is provided a support for a structure, comprising a telescopic leg having inner and outer members adapted to be releasably secured together against inward telescopic movement in any of a plurality of predetermined relative positions, the outer member being furnished with two spaced attachment means for connection to a structure which is to be supported and the inner member being formed with a series of substantially equally longitudinally spaced openings therein, a locking peg insertable in any of said openings so as to extend outwardly of the inner member and, by engagement with the said outer member,

to prevent inward telescopic movement of such members beyond said locking peg, a fulcrum peg similarly insertable in any of said openings, and lifting means in the form of a lever engageable with said fulcrum peg and having a cam surface engageable with a part of or on the said outer member so that rotation of said lever will cause or control outward or inward telescopic movement of said members to raise or lower a structure supported thereby.

Preferably, and in accordance with a further feature of the invention, the supports may be so formed as to be stackable one upon another, so as to make it possible to erect a two-storey hut, for example. Thus, the said outer member may be provided with a co-axial spigot at the end thereof remote from the inner member, the free end of the said inner member then being of tubular form and the spigot being so dimensioned as to be a close fit therein, so that a similar support may be stacked on the first mentioned support with their respective inner and outer members so interengaged.

In a preferred form of the invention the said openings in the inner member extend completely therethrough, so that the said locking peg may extend through the inner member to support the outer member at transversely opposite points thereof by engagement either with the inner end face of the outer member or in said opening in the latter. The said lever may then be bifurcated and formed with a pair of mutually similar parallel cam surfaces, and a pair of mutually similar fulcrum peg engaging means for engagement with opposite ends of said fulcrum peg respectively.

The said supports on the outer member for attachment to a structure which is to be

[Price 4s. 6d.]

The first patent relating to Portakabin, applied for in 1961.

The Birth of Portakabin

Portakabin Ltd was formed on 3 March 1961. The name dreamt up by the company's founder, Donald Shepherd, quickly established itself in the public imagination. Gaining recognition almost as quickly as it took to set up one of the company's buildings, it became a powerful brand name which the company has always fought to protect.

Originally aimed at supplying instant portable accommodation for construction sites, the York-based business has moved a long way from those simple beginnings. Today the company designs and manufactures a wide range of sophisticated high-quality products for many different applications. The Titan is the largest single portable building in Europe and the Ultima building system can be used to create open-plan offices for a thousand or more people. The innovative Yorkon modular building system has been used to create high-quality buildings all over the country, from hospitals, schools and fast-food restaurants to supermarkets and forecourt shops. The tough and secure site accommodation supplied by Konstructa Hire can be found on many building sites.

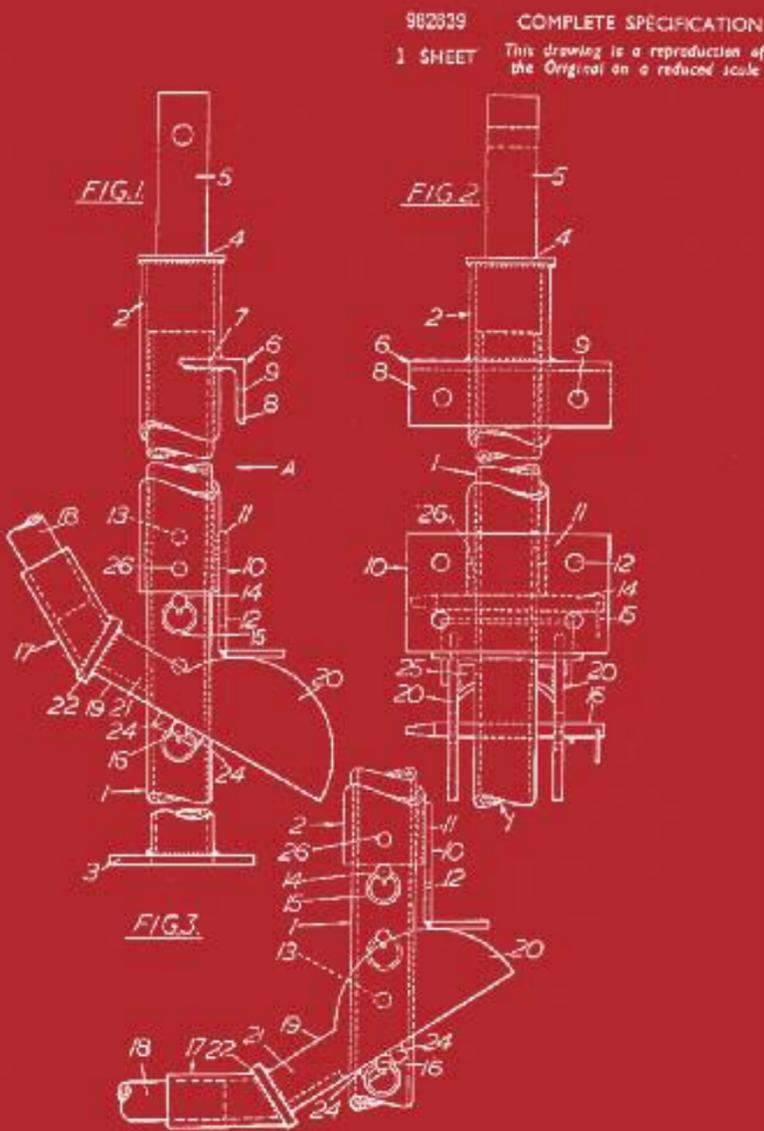
Portakabin was ahead of its time but over half a century its success has more than vindicated Donald Shepherd's faith in the future of off-site construction and modular building systems. At Portakabin innovation has been a tradition. Supported by an outstanding record for quality and customer service, the company remains the market leader in modular construction.

How did the Portakabin story begin? Donald Shepherd returned from military service in 1946 to take over the family firm's largest-ever construction contract, for

married quarters at Catterick Camp in the North Riding of Yorkshire. Always an impatient man, he was staggered by the amount of time and energy wasted in putting up site accommodation. It took three weeks to complete, marshalling joiners, electricians and plumbers, ordering timber, glass, putty and nails, and then it all had to be taken down again at the end of the job. All this before any work began on site. Wouldn't it be so much easier, he thought, if there was a single transportable office, delivered ready for use? The idea would lie dormant in his mind for more than a decade while he invested his energy in managing the post-war expansion of the family business.

Britain was a very different place in the years after the war. The country was victorious but impoverished. These were years of austerity, epitomised by the terrible winter of 1947. Daily power cuts of five hours a day were imposed as power stations ran out of coal. Energy-saving measures included cutting back radio services, reducing the size of newspapers and dimming traffic lights. The weather even led to the rationing of potatoes, which had never happened during the war. It was only in 1954 that rationing was finally abolished.

This was also the year when the final controls were removed from the building industry. In previous years, when labour and skills were still in short supply, the industry had looked to alternative methods of construction. One was the use of pre-cast concrete panels. This became big business for Donald Shepherd's family firm, F Shepherd & Son. One of the challenges was finding a more efficient way of handling much greater volumes of cement. The solution provided by Donald Shepherd, the most inventive of all his brothers, was the Portasilos.



The detailed drawing of the Lodastrut mechanism which accompanied the first patent application.

selling point that they could be loaded and unloaded by one man. The timber silos were made by the firm's joinery subsidiary which would also manufacture the first *Portakabin* buildings, and the same scarf-jointing technique was employed for both products. And producing the *Portasilo* system gave the firm valuable manufacturing experience. It proved an instant success when it was launched in July 1953.

With the abolition of state controls, the economy boomed during the second half of the 1950s. It was a time of renewed prosperity as the annual growth rate soared to 5 per cent. Between 1948 and 1970 the unemployment rate exceeded 2 per cent only twice. Between 1952 and 1959 the average weekly wage doubled. As Harold Macmillan observed in 1957, 'Let's be frank about it, most of our people have never had it so good'. Consumer spending escalated. In 1958 owner-occupiers outnumbered those renting their homes for the first time. Between 1952 and 1959 the number of private cars in the UK doubled to five million. The first stretch of motorway in the UK, the Preston by-pass, opened in 1958. By 1956 98 per cent of the population could receive television. By then the number of licences had grown from just 15,000 in 1946 to more than five million. The supermarket began to replace traditional shops on the high street, with numbers increasing from just 80 in 1957 to 572 in 1961. Economic well-being also planted the seeds of social change. Rock 'n' roll heralded the age of the teenager while plays such as John Osborne's *Look Back In Anger* reflected the move away from a deferential society.

The success of the *Portasilo* system provided plenty of work for Shepherd Woodwork, the joinery arm of the business. But in 1956 an improved design adopted steel and aluminium in place of timber and left the joinery business with spare capacity.

This was the opportunity Donald Shepherd had been waiting for. He resurrected the idea of an easily portable, ready-built, instantly locatable site building. The firm's own architects produced the first set of drawings in 1958. Since the traditional method of

In several ways the development of the *Portasilo* cement-handling system helped to pave the way for the *Portakabin* concept. It used the famous 'Porta' prefix for the first time. It was designed by John Bramall who would also contribute towards the design of the first *Portakabin* building. Both products shared the key

Predecessors of the *Portakabin* building

The movable building has a long history. Tents, shelter carried from place to place, perhaps represent its most elemental form. There are some remarkable and ambitious examples of movable buildings in history. In 1787 the architect and engineer Samuel Wyatt built 12 hospitals which could be dismantled and re-erected in an hour without the use of tools. In 1830 a London builder and carpenter, John Manning, devised the Manning Portable Colonial Cottage. Compact, easy to erect and, with repetitive parts of the same dimension, modular, it is seen as the beginning of prefabricated construction. In the United States demand for prefabricated homes was stimulated by the Californian Gold Rush of 1849 and then the settlement of the prairies from the 1860s. By the 1890s Sears Roebuck was selling house kits by mail order but, with 30,000 different components, they were never intended to be portable. The largest building ever specifically designed to be demountable was the Crystal Palace in London. Its construction was remarkably rapid – the architect, Joseph Paxton, made his first sketches on 11 June 1850, work began on site on 30 July and the building (563 metres long, 124 metres wide and 33 metres high) was finished by January 1851. Its innovation lay in using a component system for building and site assembly, allowing speedy erection and dismantling distant from the factory – advantages *Portakabin* would capitalise

upon more than a century later. Donald Shepherd also shared the same vision as the great Isambard Kingdom Brunel whose portable hospital designed for the Crimean War was based on the following principles – the building should be locatable within reasonable limits on any type of ground; it should be easily extendable; and it should be very portable and economical to construct. The same principles were also adopted by the Canadian military engineer who designed the Nissen Hut during the First World War. Each hut could be erected by four men in four hours with just one spanner and carried on a single lorry. By 1917 some 20,000 Nissen Huts were in use. After the First World War several attempts were made to produce good-looking, practical and re-usable factory-made buildings but they made little headway. Buckminster Fuller's Wichita House of the 1940s was designed to be made on a production line and speedily assembled. It could be erected by six men in one day for half the cost of a traditional building and it came with automatic natural ventilation, air-filtering, movable partitions and fitted kitchen and bathroom. But it never went into production because Buckminster Fuller as an architect could never bring himself to give up control of the project and spent too much money on its development.

joining standard panels would not give the building enough strength, the scarf-jointing technique used by *Portasilo* was adopted. This had been used for Mosquito aircraft during the Second World War and some of the men who had made the aircraft had returned to work for Shepherd Woodwork. The seamless joints used in the technique produced much stronger panels by bonding together both the outer and inner sections of the plywood sheets. The robust and durable one-piece wall panel was the new building's first innovative characteristic.

Donald Shepherd handed over the specifications to Reg Stallard, the firm's consultant architect. He told Stallard he wanted a portable building that could be made as inexpensively as possible but added, 'I believe that good design pays.'

Shepherd also wanted the new building to be as easy as the *Portasilo* system for one man to load and unload. He asked John Bramall to come up with a solution. Bramall had joined the firm in 1952 as superintendent in charge of the mechanical engineering department. His answer was another innovation, a system of telescopic legs to lower and raise the building which could be operated by one man. Initially it was intended that each leg should pass through two simple collars attached to the outside wall. It was the genius of Donald Shepherd which came up with the idea of replacing the collars with a continuous outer tube – this gave even greater strength to the whole building; allowed it to be located on just four flat points, making it adjustable on uneven ground; and made it possible, by adding flat plates to the top of each tube, to stack one building on top of another. Above all, the system fulfilled Donald Shepherd's brief that the *Portakabin* could be handled by one man without any special skill or equipment. It was calculated that each building would take only 15 minutes to pick up and even less to

set down. The innovative elements of what became known as the *Lodastrut* system formed the earliest patent connected with *Portakabin*. It was filed in the names of both Donald Shepherd and John Bramall in 1961.

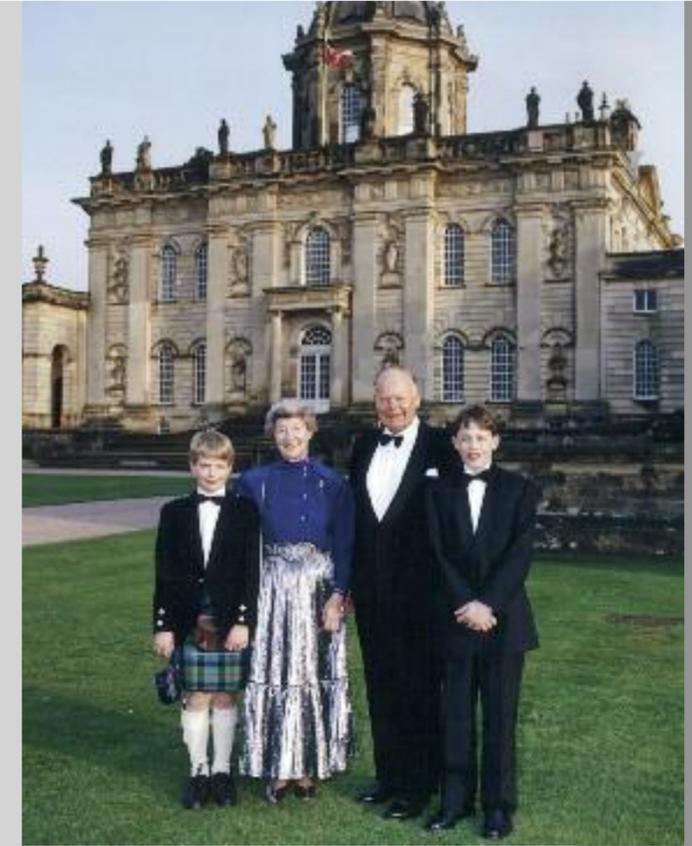
In the meantime, Reg Stallard was completing his design. Stallard took to heart Donald Shepherd's insistence on making it as inexpensive as possible to produce. He based its width on the standard four-foot-wide plywood sheet. This not only helped in economical production but also allowed the building to be carried easily on the typical lorry platform of the day, which was just seven feet six inches wide. This was also well within the maximum width permitted for transporting loads by road without a police escort. Each building was 16 feet long, the equivalent of four vertical sheets measuring eight feet by four feet. Inside, a chair rail carried power cables, louvre windows gave ventilation and there was a built-in desk and plan table at each end. Lights and power sockets used rocker switches ordered specially from Italy, some of the first in the UK. Each building would be painted inside and out in three shades of grey (gunmetal, ember and silver birch), enlivened only by the vivid daffodil yellow used for the door and the tubes housing the telescopic legs.

The simplicity, proportion and practicality of Stallard's detailed design impressed Donald Shepherd. It appealed to his aesthetic sense – when he later had a new house built for his family, it was based on the futuristic, sleek and minimal timber-framed houses he had seen in Sweden and the USA – and he wanted the new buildings to be 'well-mannered' and to fit in with their surroundings.

All that was needed was a name for the new product and new company. Several suggestions were made. The final fortunate choice was '*Portakabin*'.

Donald Shepherd

Born in 1918, Donald Shepherd was the second of six brothers. Four of them, Peter, Donald, Colin and Michael, would all play a role in expanding the family business. Donald joined the business at the age of 15 after leaving school. He served in the Royal Artillery during the Second World War. Good natured, he could be impatient, and he had a quick temper – as his colleague Cyril Branchette remarked, 'He was like an incendiary bomb if he was upset'. But his anger subsided quickly, and he never bore a grudge. He was actually quite a shy man and never liked public speaking, although it was a responsibility he never shirked. Blessed with an inventive mind, he was driven by ideas throughout his working life, and was appointed Technical Director as well as Deputy Managing Director of F Shepherd & Son in 1957. His son Patrick remembered how his father 'thought about things endlessly' and was always writing copious notes of things to do. One of his managers, Will Driffield, recalled how Donald 'always wanted to develop something else, he always wanted to keep having a go'. David Thompson, who became UK Hire Director for *Portakabin*, believed that business for Donald was more about ideas than money. He had the instinctive ability to think up imaginative solutions to business challenges. From the need to find an easier way to handle larger volumes of cement came the *Portasilo* system. When metal was used in place of timber to make the silos, and the business had spare woodworking capacity, he resurrected his long-held idea for easily handled ready-made movable site accommodation. His experience of the off-site production methods used for pre-fabricated concrete houses helped him to develop an effective factory system to produce the growing range of *Portakabin* buildings. He was at the forefront of those who saw the



Donald Shepherd's retirement was celebrated in style at Castle Howard in North Yorkshire.

commercial viability of design-and-build, setting up the York Design Group as part of the business in 1958. Much later, he would draw on this experience when he added the concept of 'a single source building service' to the flexibility of factory-produced modular building systems. The result was *Yorkon*, which became a leading supplier of modular buildings. A typical entrepreneur in many ways, he hated wasting a single moment. As Patrick recalled, his father 'was always running late, his time-keeping was atrocious, not because he was dilatory, but because he was always trying to squeeze a lot in'. While he looked after his senior executives, seeing in them the future of the business, there was never any doubt as long as he was around that the business was driven by him and only by him. Never frightened of failure – and he had his share – he was a man with the courage to make decisions for the long term. Down-to-earth and respected by those around him, he cycled to work every morning. His first port of call was usually the workshop to have a mug of tea with the men. He always played a central role in the business as a whole and had a wide range of outside interests. Awarded the OBE in 1992, he finally retired in 1996 and died suddenly while on holiday little more than a year later.