

# THE KEITH BLACKMAN STORY

As featured in *Heating & Ventilating*, 1958

# THE KEITH BLACKMAN STORY

Tracing the development of the Company, the foundation of which was laid in 1823, during the reign of George IV.

"A MECHANICAL contrivance for moving any quantity of air with a minimum of power." This somewhat terse definition of the Company's principal product is given in the preface of the first catalogue published by The Blackman Air Propeller Ventilating Co. Ltd. The date of publication was 1883, the year which heralded the birth of the fan manufacturing side of the Company.

But the true fan story would be incomplete without going back some twenty-five centuries, to the time of the oft-quoted Chinese philosopher, Confucius. Even at that stage of mankind, hand manipulated fans were used by



the Orientals for creating a cooling effect in the absence of any better method of 'man cooling.'

In religion, the "Flabellum," an ecclesiastical fan used to disperse flies and pestilence from the sacramental vessels was perhaps the best known, whilst in Egypt, and India the fan symbolised happiness, royalty and power. Even today attendants waiting on the Pope carry fans on state occasions.

The hand fan or 'lady's companion' of bygone days was mainly decorative, though had fly swatting possibilities and as an article of adornment and fashion quickly gained popularity among the well-to-do classes. Elaborately made in gold, silver or ivory and sometimes inlaid with precious stones, its design often portrayed scenes of

mythological or historical interest. Styles varied with the occasion; for weddings or funerals, for church- or theatre-going. Take, for example, the



'lorgnette' fan with concealed peep-holes worked artfully into the pattern "so that the owner while pretending to screen her eyes from the risqué scene in a play could see all that was going on". So much for the hand fan. It began as a necessity, ended as a luxury and like so many such fashions has tended to become outmoded.

\* Back now, to the formation of The Blackman Air Propeller Ventilating Co. Ltd. This Company was incorporated on September 10th, 1883 for the purpose of manufacturing and selling belt driven ventilating and exhaust fans by an agreement with Lucius Fisher, James Morgan Blackman and Walter Burnham, all of Illinois. It is assumed therefore that though no documents exist to prove the point, the propeller fan originated in the U.S.A.

The earliest records in the Company's hands today provide adequate proof of the need, then, for an effective mechanical fan. Among the first users of the Blackman Air Propeller were the Criterion Theatre Piccadilly, William Whiteley ("The Universal Provider"), His Grace, The Duke of Sutherland, the Right Hon. the Marquis of Salisbury and several paper mills and breweries. The business office and showroom of the Company were situated close by Moorgate Station, London at 57, Fore Street, E.C.2.

\* Developments during the latter years of the nineteenth century included the opening of the Holloway Works in 1888, the introduction of the electric Blackman fan three years later and an ever increasing list of applications of the air propeller including tea withering, steam removal from laundries, dye-houses and paper machine-rooms, and drying of textiles, timber, bricks, hops and leather. A 72 in belt driven Blackman fan at the time, packed in a non-returnable crate and delivered to any railway station in the U.K., cost £45. The Blackman Patent Air Filter using coke as the filtering medium was put on the market in 1898 for "... intercepting and destroying the germs of disease in vitiated air from Infectious Disease Wards, and for similar purposes." In 1890 the Company's lengthy



First of the many.

title was reduced to The Blackman Ventilating Co. Ltd., and branches operated from offices in Manchester, Glasgow, Bristol, Bradford and Accrington. Other present day branch offices were, according to available information, opened as follows: Birmingham and Newcastle, 1892, Belfast, 1893 and Leeds, 1894, though not at their current addresses.

At the time that the Blackman Ventilating Company was consolidating its position in its new industry the business of James Keith, Consulting Engineer and manufacturer of gas, water and heating appliances, was well established with a London office and



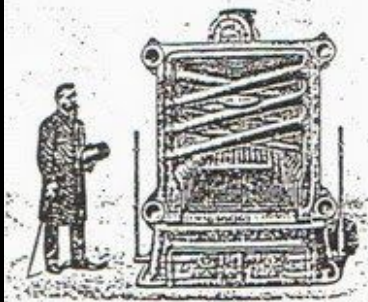
showroom at 57, Holborn Viaduct London, E.C. and works at Arbroath. These works on the east coast of Scotland were originally founded one hundred and thirty-three years ago by James Keith's grandfather. He, too, was a James who in 1823 ran a small business as a tinsmith and gas fitter in the High Street which might be considered, albeit indirectly, the origin of the Company as we know it today.



James Keith's London Office & Showroom

Twenty years later, on the death of James the founder, his twenty-one year old son, George, took control of the business to be succeeded in turn in 1870 by his own son, James, the consulting engineer.

Referring to the book 'Heating by Artificial Means' published in 1884, we find that James Keith, C.E. "began his education as a water engineer in America and Canada, where he studied the different methods of heating, the severe winters there having long exercised American ingenuity in heating before attention was directed to the subject on this side of the Atlantic as fully as it has been recently. He considers that he has improved on even the best American modes of heating, and the fact that a large demand has sprung up for his boilers in America speaks well for their success". It certainly did and



James Keith, C.E., with cross section of 'Python' boiler.

there is no doubt that James Keith introduced both independent and sectional hot water boilers and sectional radiators to the British Isles.

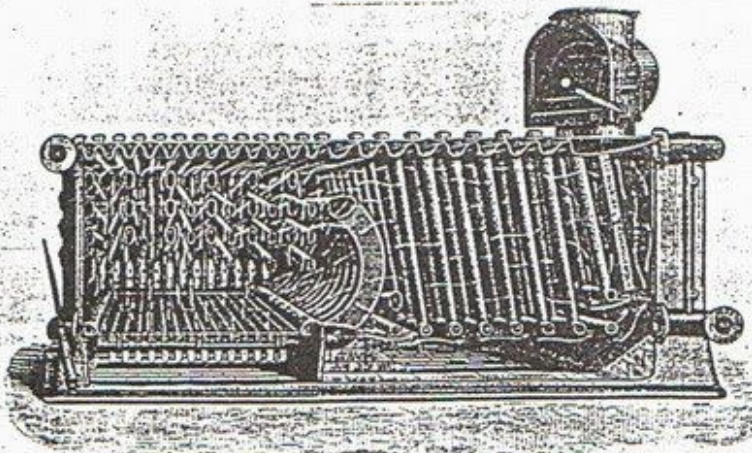
From the year 1870, the James Keith business expanded in many directions. Developments in the next thirty years included the 'Python', 'Challenge' and 'Viaduct' boilers for hot water heating, 'Universal' sectional radiators, hydraulic ram pumps, mineral oil gas works for "lighting mansions, factories, etc. . . ." and as "adopted by the Board of Trade and Commissioners of Northern Lights for illumination and fog signalling . . ." These same gas plants were erected in about 1892 on Langness Point, Isle of Man, and at Ailsa Craig Rock, Firth of Clyde.

By 1900 the twin industries of heating and ventilation as developed

by the products of James Keith and The Blackman Ventilating Co. respectively, had become closely associated and culminated in the amalgamation of the two companies with the head office at 27, Farringdon Avenue, near Ludgate Circus, E.C.4. The company's name became James Keith & Blackman Co. Ltd. x

THIS FIRST CHAPTER in the history of Keith Blackman, presented here to acquaint readers with the Company's origin, will be taken a further stage in the December NEWS.

If, in its reading, you, the older reader, are reminded of any anecdotes worth recounting concerning the Company and its products in the twenty or so years following the amalgamation, a note to the Editor (or letter, as mentioned elsewhere in this issue) will be appreciated.



Longitudinal section of the 'Python' described in a technical book of 1891 as "the most powerful form of boiler that has yet been made for hot water circulation."



# THE KEITH BLACKMAN STORY

## Part 2

THE YEAR was 1900. Ladysmith, Mafeking, Spion Kop and the Boer War in general were front page news. Queen Victoria celebrated her 81st birthday while Count Zeppelin's aerial ship flew 3½ miles in Germany. Household coal rose to 40/- per ton and King Humbert of Italy was assassinated. Cambridge won the Boat Race by 20 lengths and the Boxer rebellion was active in China. This then was the background to the year in which the amalgamation of the Blackman Ventilating Company and the James Keith organisation occurred.

Within a few years the combined companies, under the title James Keith & Blackman Co. Ltd., were producing a variety of machines and apparatus apart from the fans and heating equipment which drew them together originally. Let us illustrate the point by running through some of the catalogues and other printed matter of the times.

↳ The Glasgow International Exhibition of 1901 was the first occasion on which the Company used this method of showing its wares, relying hitherto on showrooms at the Head Office. Described as "one of the best designed stands in the hall" we displayed a variety of box-bladed ventilators including one of 96 inches diameter and the water-driven Blackman fan used " . . . for the ventilation of Underground Public Conveniences, where the water is again utilized for flushing purposes, as it leaves the Fan", along with different types of boilers and radiators, and four high pressure gas lanterns of 1,000 candle power which "owed their brilliancy to a Keith Automatic Gas Compressor."↳

✕ Other exhibits which are no longer associated with the Company's range were the "Aiolian" Hot Closet which by hot water or low pressure steam, kept food or dishes warm; also the hydraulically

storm." Modifications of the 'Keith' fan were patented in 1909 and 1910 these being

- (a) the electric table fan with table lamp combined, for creating

Early evolution of the 'Keith' fan wheel.



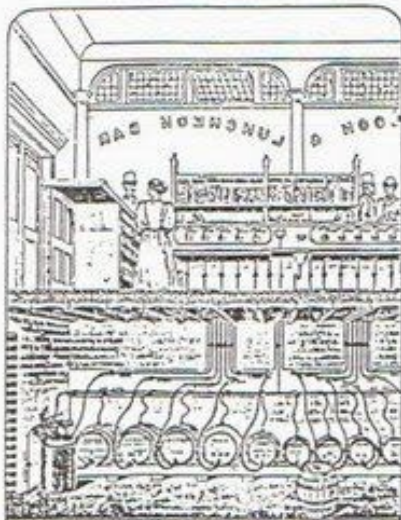
operated organ blower and Automatic Liquid Elevator for raising, serving and bottling beer and spirits.

Plant for dust removal from polishing and grinding operations was introduced at about 1900 and made a great impression on industry. One client wrote that it was a treat to enter his bobbing and polishing shop as it was so delightfully clean, cool and healthy. Yet the six fans installed were of the earliest propeller type, preceding the first of the 'P' and 'Keith' fans which are used for the same purpose today. Mr. James Keith invented his first 'Keith' fan wheels and casings in 1906 and followed them up two years later, with a new design of impeller virtually the same as that used today "which so far outstripped every other type or form of fan for volume-pressure work, that it took the whole fan world by

comfortable conditions in dining rooms and offices.

- (b) another table fan for railway carriages, tramcars, smoking cars and the like, and
- (c) the open 'Keith' fan for the ventilation of underground power stations and engine rooms or stokeholds of ocean going liners as referred to in the article "Pity the poor sailors . . ." on page 6, dealing with marine fans.

↳ As would be expected blowers were introduced at about this time, they being cast iron standard and narrow pattern high pressure types, gas boosters, forge blowers and portable types. A domestic vacuum cleaner known as the 'Excelsior Ideal' and incorporating a small forge type blower was yet another product and was made for The British Vacuum Cleaner Co. Ltd. ↳



### KEITH'S PATENT Automatic Liquid Elevator

"is a combination of a Water Motor and Air Pump. Is placed in the cellar—as illustrated—and connected to the water service pipe from the main preferably, and a waste pipe is carried to the nearest waste, or the water can be raised automatically and used for various purposes, in which case the Apparatus costs nothing to run. An air main is taken from the Air Receiver, and is run usually along the roof or walls and through any number of cellars. Branches consisting of special rubber hose are taken off wherever required to any number of casks, and a barrel connection with a cock is screwed into shive in cask, or in the case of Mild Ale, a special Air-tight Bung is supplied. A Ceiling Cock is fixed on the Air Main also, so that the pressure can be turned on or off any particular cask without interfering with the others in the slightest.

When the Machine is adapted to the existing Beer Pumps, the Beer is simply sent up through the Pumps without working them, and drawn off at a Tap fixed on Pump Nozzle. One Machine supplies a complete house, and raises Beer, Stout, Spirits, &c., and also washes out the Beer Pipes thoroughly.

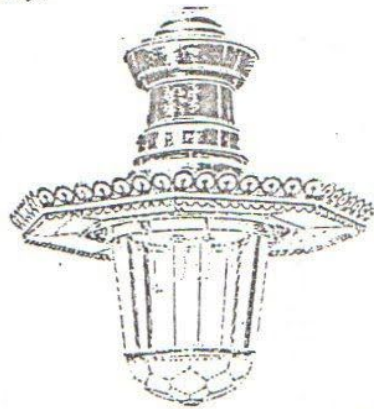


Illustration reproduced from a photograph taken in the Carlton Hotel, Pall Mall, London, W. showing the Keith Electric Table Fan in operation in the centre of one of the Dining Tables.

James Keith & Blackman hold another unique place in British industry as pioneers in the use of the new fuel of the times, coal

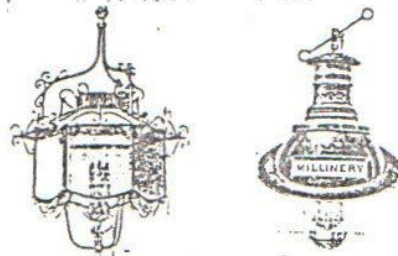
gas. George Keith, son of James, specially studied this medium of fuel, power and light which was to revolutionise industry, and of which he became a leading authority at home and on the continents of America and Europe.

Keith gas lights were used in their thousands for both internal and external illumination and examples of the earlier forms are illustrated here. Such famous thoroughfares as Whitehall, Fleet Street, Piccadilly Circus, Pall Mall, London and Blackfriars Bridges and Charing Cross Road were so lit and, in fact, some still are today.



1,000 candle power suspended type lamp for outdoor use.

Other machines and appliances related to the use of gas for heating or lighting were the large range of belt or motor driven rotary compressors (one of which was operated by water), diaphragm governors and pressure gauges, laundry irons (the heaviest being the aptly named, 30 lb. 'Jumbo'), soldering irons, injectors and burners and so on. The list was arm-long



Typical internal (left) and external gas lamps by K.B.

and some are still in production, all of modified and improved form.

Constant expansion and improvements at Holloway Road, London, and Arbroath Works were effected to keep pace with ever-increasing business. The last words on this episode are left to Mr. James Keith who, at a meeting held in 1910 announced, 'Having recently returned from the United States I may say, with every confidence, that I am convinced we are ahead of everybody in the U.S.A. and Canada, as well as here and on the Continent, both in the fan business and high pressure gas lighting . . .'

Part 3 of THE KEITH BLACKMAN STORY will appear in the March issue of his journal.



# THE KEITH BLACKMAN STORY

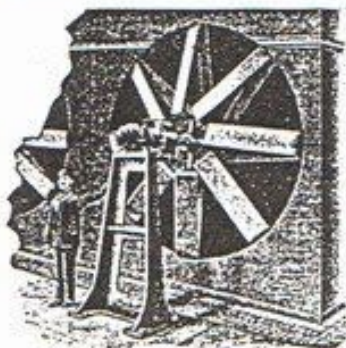
## PART 3

PARTS 1 and 2 of this historical review spanned the years 1823 up to the turn of the present century. These were years in which the Industrial Revolution, which commenced in the reign of King George III and Prime Minister William Pitt the Younger, had a resounding effect on British industry in general and James Keith, followed by the Blackman Air Propeller Co., Ltd., in particular. By 1910 the size of the Company and the scope of its products could be attributed not only to the rapid growth of industry throughout the United Kingdom over the previous century, but also to the efforts of the members of the organisation in developing equipment to suit the needs of the times.

Records show that high pressure gas lamps, compressors and other gas appliances along with hot water boilers, radiators and associated plumbing fixtures continued to dominate in their markets.

The instantaneous success of the Blackman air propeller when introduced to Great Britain and the continents of Europe

seded. Statisticians may be interested to note that in the last 25 years alone over 34,000 belt driven "Streamline" fans have been made, which based even on the smallest size adds up to a lot of air movement.



The Double Blackman fan fitted at the base of a cooling tower.

Matching the popularity of the Blackman propeller fan in 1910 was the Keith centrifugal type, which had been invented only four years before by Mr. James Keith. Exceptional efficiency for those days coupled with its capacity for handling large air volumes against moderate resistance, made the Keith fan ideally suited to the ventilation of mines, ships and buildings of every description and for such industrial applications as mechanical draught, the removal of dust, fumes and smoke and for drying processes. Standard sizes ranged from 5 inches to 60 inches depending on the diameter of the circular outlet. X

This same fan was incorporated in an air heating unit called the Inclined Tube Thermo-Ventilator which employed steam as the heating medium to warm factories,

workshops and warehouses. It was used in its smallest size as a railway carriage ventilator and, as it was termed, the Electric Plenum Window Ventilator. The "K.B." system of drying for timber, textiles, leather, laundry work, etc., involved both Keith and Blackman fans together with steam heaters. Apart from its use in the Thermo-Ventilator, the "open" or caseless Keith fan was introduced for the ventilation or cooling of engine room spaces on land and sea, the power house at St. Denis, outside Paris, and the underground engine room in the Singer Building, Broadway, New York, being quoted here in confirmation of the fan's universal acceptance. An earlier issue of this journal mentioned use made of fans of the same type in the engine rooms of Transatlantic liners and warships of the British, American, Italian and Japanese navies during World War I. Another marine application of the Keith

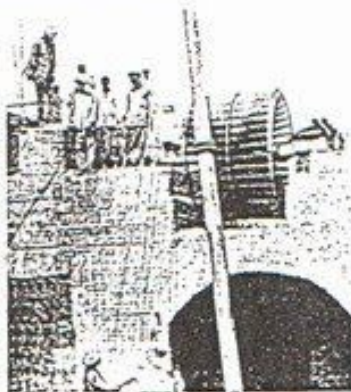


Sectional view of the Inclined Tube Thermo-Ventilator.



Oast house hop drying by Blackman box-bladed fans. Note the prime mover!

and Asia twenty-seven years earlier was well founded. Known as the box bladed, Type 1 fan in 1910, it was still in great demand and no better testimony to both its efficiency and the craftsmanship which went into its design and manufacture can be found than that some of its type are still at work throughout the country to-day. Progress was not however to be denied and various alternative types of propeller fans were designed to meet specific problems and duties. Within ten years the Double Blackman Reversible Fan for exhausting corrosive fumes, cooling, etc., had arrived, followed by the noiseless, four-bladed Type 2, small desk type and slow running ceiling fans. The first known reference to the "Streamline" fan was made in 1920 when it was introduced as the Open Blackman Reversible Fan and even now this type is not entirely super-



77 inch, double inlet, Keith fan in course of erection; at mine in India.

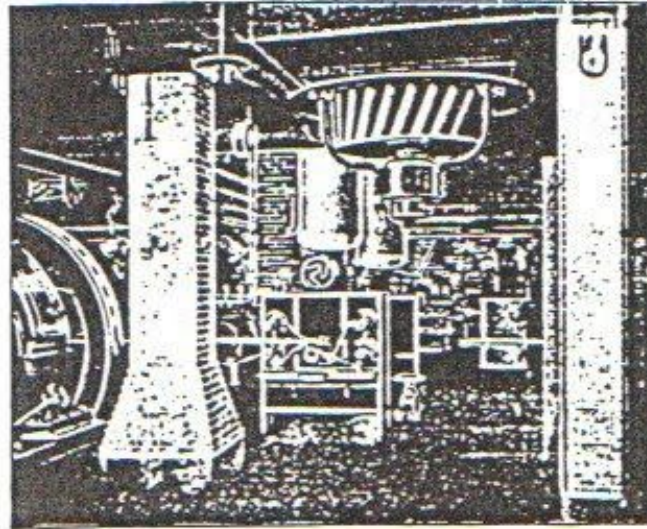
fan was its use in the Rhigothermo Plenum Ventilating Unit which provided fresh air, either heated or cooled, for state rooms and saloons.

Fast running, high pressure blowers which emerged in about 1910 were a logical outcome of the centrifugal fan. They found ready acceptance in a wide field of industrial applications including cupola blowing, gas boosting and furnace blast. Other blowers arrived to complete a very comprehensive range these being the Types "S", "N", "S.G.", "N.G." and "M.P.", ventilation of "stink" cupboards being one of the less elegant uses of the last named.

Though Paddle Wheel fans were still a thing of the future at this period, the more scientific approach to dust removal problems was engendered with the Keith fan available. The standard 32-bladed im-



PELLER was suitable for the finer dust from emery grinders and polishing spindles while similar fans with fewer blades were designed for wood refuse. These in turn



As exemplified in the Underground Engine Room or Power House of the great Singer Building, Broadway, New York, United States, where three large Open Keith Fans (as illustrated) are capable of propelling pure fresh air into the Engine Room, under moderate water-gauge to the extent of 120,000 cubic feet per minute, or more than the whole cubical air contents of the Engine Room every minute, or giving a change of air contents more than sixty times an hour. Result—comfort and phenomenal coolness without draughts, under all outside atmospherical conditions. A number of Open Keith Fans, but smaller, have also successfully replaced other forms of Fans in the Safe Deposit Vaults under the same Singer Building for giving ventilation by extraction, for which the Open Keith Fans are also eminently suitable.

were followed by another innovation, the Keith Patent Wool Type Fan for handling “. . . fibrous dust having a pronounced tendency to clog, such as is met with in the cotton, wool and jute industries. . . .” The centrifugal dust settler made its mark at the same time.

This then is the chapter written by the Company in the era from 1910 to 1920. Part 4 will appear in the summer number of the “NEWS.”



# THE KEITH BLACKMAN STORY

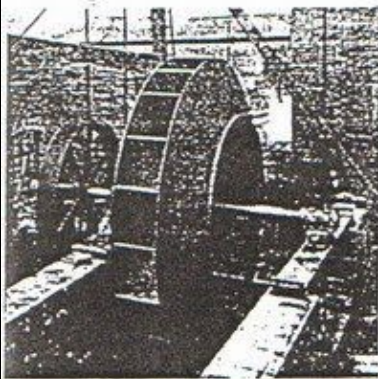
Part 4

EARLY IN THE YEAR 1921, Mr. James Keith, grandson of the Company's original founder, died. He was Managing Director for twenty years and, on his death, was succeeded by his son, Mr. George Keith, who had been Assistant Managing Director from 1909. At the same time Mr. John White Hampshire, Secretary, Mr. Arthur Collinson, Manager, and Mr. Charles Tuson, Chief Electrical Engineer, were elected Directors, the Chairman being Mr. Thomas Alsop.

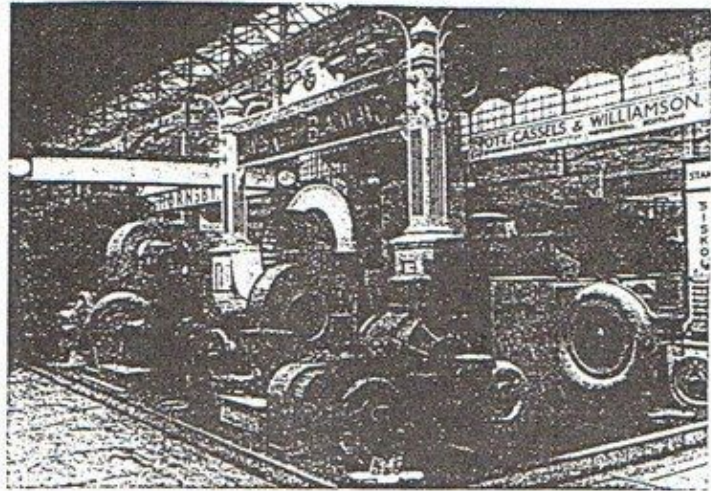
Fluctuating conditions in the world of industry and commerce improved in 1924 in which there were two highlights of particular interest. One was the conversion of one of the Company's buildings at Arbroath into a centre for recreational and social activities for the benefit of the employees and their families. At their suggestion it was called "The James Keith Hall" and under this name it flourishes still today.

How many readers remember the pageantry, the excitement, the vastness of the British Empire Exhibition which was opened by King George V on 23rd April, 1924, closed in the November and reopened the following year for a further five months. The Wembley Exhibition, as it was otherwise known, was a colossal undertaking occupying over two hundred acres in London's north-west suburb. It signified conclusively the end of the First Great War era and showed dramatically the rehabilitation of the Empire's productive resources. Divided into various sections, there was the Palace of Arts, the Palace of Industry and the Palace of Engineering, and it was in the latter that the Company exhibited on the stand illustrated on this page. All told, over 17 million people visited this Exhibition which cost £12 million to erect.

Economic conditions in the country



The installation of a 180 inch, type 14, high efficiency, mine ventilating fan.



Wembley Exhibition, 1924.

continued unstable more or less throughout the 1920's and yet the Company gradually consolidated its position despite fierce competition caused by a general hesitancy by industry to expand. In 1927, as a token of faith in the future, a considerable extension in the shape of a new, three-storey building, was made to Holloway Works. Simultaneously another 1½ acres was added to the Arbroath Works to permit further development. Collectively, these extensions permitted a 20% increase over previous production.

The much-regretted death of Mr. Alsop, who had been Chairman of the Company for 33 years, and of Mr. T. B. Callard, a Director of 28 years standing, occurred in 1929. This was the year in which Mr. W. B. Richards, Mr. M. Burningham and Mr. E. Beattie were elected to the Board.

Due to the increasing demands for much larger and heavier fans considerable alterations at Arbroath involving the erection of two bays, were put in hand.

These were completed during the following year and materially assisted in the production of Keith fans of greater size than hitherto. Their use particularly in the mining industry for main ventilation, resulted in a steady flow of orders for fans up to 180 inches in diameter.

The general depression of 1931 affected James Keith & Blackman as it did all other industries in this country and elsewhere, and though the tide did not turn until two years later, Britain recovered more rapidly than any other nation from this "industrial hurricane". Recovery as far as the Company was concerned was so rapid that by 1935 Holloway was working at full capacity and found difficulty in coping with the demands for the lighter type fans. Within twelve months negotiations were started to secure land for a completely new office and factory site. In the four years from 1932 the total number of employees rose from 855 to 1,138.

A major product development around the

(continued on page 2.)

## The K.B. Story (from p.3)

middle thirties was the introduction of the axial type fan based on the latest aerofoil theory. Our first patents were issued in 1936: the results of many years experiments. Reference to the earliest axial fans will be found in the article, "Full Steam Ahead," on page 6.

1936 was also the year of the fire. It broke out in the early hours of the morning of 15th July in the building occupied by C. & E. Layton Ltd., printing blockmakers and typesetters, which adjoined our Head Office at 27, Farringdon Avenue on the corner of Farringdon Street. Spreading to the top floors of our building, the fire caused serious damage to the Buying and Cost Departments, and the Drawing Offices. The latter were moved temporarily to Holloway Works and subsequently to accommodation in Farringdon Road, while the Buying and Cost Departments were transferred to the opposite side of Farringdon Avenue.

(To be continued)



# THE KEITH BLACKMAN STORY

Part 5

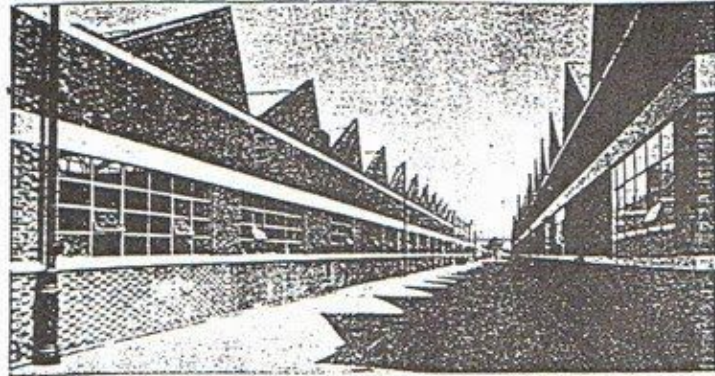
THE FIRST public statement disclosing the Company's intention to build a new head office and works at Tottenham, a nearby borough to Holloway, was made in 1936, only a few weeks before the fire occurred to which reference was made in the June "News." Excessive pressure on the manufacturing capacity of the Holloway works, which had by then expanded as far as was physically possible, forced the issue. The timing of this new venture could not have been better. Within twelve months not only had the 1937 Factory Act been introduced but, in addition, an extension of the rearmament programme was announced—two factors instrumental in bringing about an even greater demand for Keith Blackman-made equipment.



Main entrance of Head Office, Tottenham.

Provincial members of the Company may be interested to know a little about the site chosen for these new works and principal offices. Covering a total area of some 10½ acres, the works are situated virtually on the banks of the River Lea, one of the many tributaries of the Thames, just on the border of Tottenham and Walthamstow and on the county border separating Middlesex from Essex. The City of London is, as the crow flies, some 5½ miles distant; Westminster approximately 7 miles away. An old mill dating back to at least the 13th or 14th century and standing in a meadow beside the river explains how Mill Mead Road gained its name. The mill was burnt down just one hundred and one years ago.

Apart from fans, Tottenham is perhaps best known for duplicating machines and



"Keith" Avenue, running south to north between the two major workshop areas.

stationery, furniture and football. The Spurs football ground is close by. The origin of Tottenham High Cross, a local landmark, is obscure. It was possibly a market cross and is mentioned in Manor Rolls of the 15th century. Originally of wood, it was subsequently replaced by a stone cross and in the last century reconstructed in concrete. This then, in a nutshell, is Tottenham.

Erection of the new buildings, of which the works received priority, continued through 1937 and the following year, and 250 men were employed at Tottenham when the Plateway Section was opened in early 1938. A few more months and the whole works was completed, permitting all remaining Holloway-based personnel to be transferred to the Mill Mead Road address. Both office block and the canteen restaurant, which was designed to accommodate 650 at one sitting were, by this time, well in hand and were eventually occupied in March, 1939. Messrs. S. Clifford Tee & Gale were the architects of this extensive project which was widely acclaimed in the technical press as the following comments from their pages show: "Capacious new offices and works . . . are of high architectural merit" ("The Colliery Guardian"). "Up to date works in which new manufacturing plant has been installed" ("The P.L.R. Bulletin"). "The imposing new works and offices . . . cover an area of 300,000 square feet" ("The Power Laundry"). It was "The Metal Industry" which drew attention to the fact that the Company was one of the first in the country "to practice spot welding as a method of production."

"Janus," writing in "The Gas Times," reported: "The few words previously reported in this journal were quite inadequate to describe the model offices and works Keith Blackman have built and equipped in a pleasant setting for a part of London with no great reputation for beauty. With the River Lea on one side and a large recreation ground on the other

the amenities of the site are assured for all time. So far as the offices and shops are concerned I can safely say that one would go far to find a better example of what an industrial plant should be. Down to the smallest detail everything has been planned with care, both for efficiency and the comfort of the worker. . . . With an eye trained to be critical of engineering works, I probed for those loose ends which generally mar an otherwise excellent organisation and layout, but I can honestly say that for once I was baffled; the plan is complete and is being worked as laid down." Praise indeed from this outside source.

*To be continued.*



# THE KEITH BLACKMAN STORY

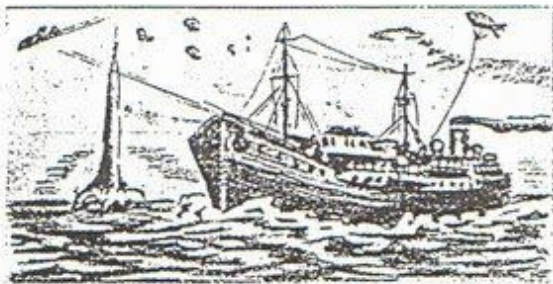
Part 6

"THE K.B. War Effort," published in 1946, tells of our contribution to the successful operation and conclusion of the Second World War. For six years, practically the whole of our output had been for high priority war work. Many products were on the Secret List and security dictated that nothing be said or published about them. Some equipment had little or no connection with that normally associated with the Company's specialties, though the majority did consist of fans, blowers, compressors, heaters and the like used in, on, or with implements of war or in their production.

In 1939 we became a Controlled Undertaking under the Admiralty, and later our manufacturing resources were employed extensively by the Ministries of Aircraft Production and Supply. This brief survey of important contracts executed for the various services may prove an eye-opener to some.

## NAVY AND MERCHANT MARINE

Mention has been made elsewhere to the fact that the driving motors of the midget submarines in the Tirpitz action were entirely designed and made by Keith Blackman. Above the sea, on the other hand, and forming an integral part of convoy type barrage balloons were many thousands



of fan boosters, driven by wind power, and used to compensate for the varying changes in the relative density of atmosphere between the inside and outside of the balloons caused by their sometimes rapid change of altitude. Cooling and fume extraction units were supplied to the Admiralty for fitting to signal projectors and searchlights aboard warships. More were made for the cooling of radar, asdic and radio equipment.

Blower and compressor sets were used for forced air warming of equipment to ensure instantaneous operation when needed. Fifty-inch axial fans ventilated the holds of transport ferries. Smaller ones ventilated the engine rooms of destroyers and gunboats. The 10,000 ton merchant vessels built to replace ships sunk by enemy action, were fitted with Keith type forced draught fans.

Among the unusual products were searchlight projectors and signalling shutters for naval landing craft and transports, alarm buoys, attached at intervals along cables fitted to ordinary buoys, which sounded a warning if vessels tried to break through the boom; also bow door pedestals for "D" Day landing craft.

## ARMY

To Ministry of Supply orders we delivered thousands of



special propeller, centrifugal and axial fans for cooling radiators of "Churchill," "Valentine," "Crusader" and "Covenanter" tanks. American type "Sherman" tanks in the Far East were fitted with air conditioning and cold air douche plants after the Company was appointed to design and develop equipment to counter the extreme heat and humidity experienced in that theatre of war. Mobile laundries carried steam removing "Streamline" fans; mobile bakeries incorporated multistage blowers for air blast to the oil-firing equipment; mobile smoke screen equipment employed multivane impellers of our making.

The essential but unpleasant disposal of thousands of rat carcasses necessitated the manufacture of a special fan set to provide air blast to an incinerator. Inoculated rats, it appears, were flown from America and from them a life-saving serum extracted to combat a deadly germ for which this serum was the only known antidote.

## ROYAL AIR FORCE

The testing of barrage balloons for the Air Force was carried out by motor- or manually-operated blowers. Hydrogen for inflating balloons involved the use of 36-inch air blowers and gas boosters.

Of particular interest is the part played by Keith Blackman fans in the development of jet propulsion. Though the contribution made by these fans was surrounded by a cloak of secrecy, they were believed to be used in the first place to produce the compressed air fed into the jet engine.

Again, outside our usual "line of country" were the component parts made for "Albemarle" bombers and the special fabrications for "Horsa" gliders used over Normandy and Arnhem.

## CIVIL DEFENCE

For the home front we made light traps for fitting to existing and new ventilating fans, and a black-out fan not dissimilar in appearance to the "Extravent" unit of to-day. Gas masks were subjected to test by K.B. compressors, and gas filtration plants were supplied to hundreds of industrial plants, telephone exchanges, and to government offices in Whitehall.

We could go on to speak of our connection with explosive factories, fire precautions for oil storage tanks, the Royal Aircraft Establishment at Farnborough, exports to Russia of mill exhausters and forced draught fans for wartime power stations, but we think enough has been said to convince anyone that in war, as in peace, the equipment we manufacture is a very necessary ally in virtually every sphere.

(To be continued)



# THE KEITH BLACKMAN STORY

Part 7

THE COMPANY'S CONTRIBUTION in terms of production during the war was recorded in the Winter edition of the "News." What, though, of the effects on Tottenham, Arbroath and Branch personnel of working under wartime conditions which at times were far from conducive to maximum effort. For some months following



the evacuation of Dunkirk in the late spring of 1940, a seven-day week was worked, the Whitsun holiday was cancelled as, in fact, was the Summer holiday. Recompense came in the form of a long week-end break later in the year.

Over four hundred men and women served in the Forces, a ratio of about one in five, and these were replaced by and large, by women. Great efforts made by the Social and Sports Club on behalf of what was known as the "Forces Fund" resulted in the raising of some £4,000 which was distributed as gifts to those in the Services. This princely sum accumulated by various means; whist drives, dances, collection boxes and raffles. The latter was possibly the most lucrative money-spinner earning as much as £10 for the Fund for half a dozen eggs and a fabulous £15 on one occasion due to the farsightedness of one Serviceman home from abroad. The prize he donated—a banana.

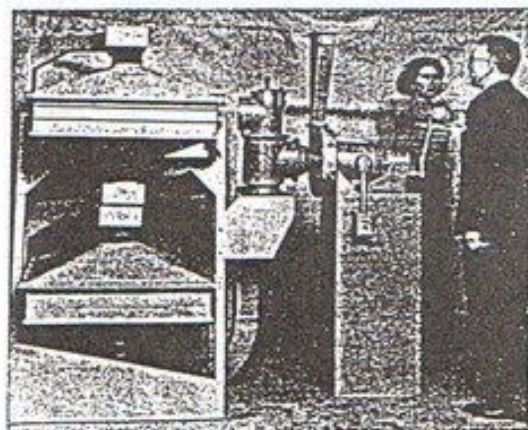
September, 1939, found the Company, at both the Tottenham and Arbroath Works, prepared with adequate means for protection of employees against aerial attack and with an ARP organisation ready for immediate action. Fortunately, although in vulnerable areas, neither of the Works suffered anything but slight damage from enemy action, nor were there any casualties. Works and offices were dotted with reinforced ARP, Fire-fighting and First Aid posts to which teams of workers reported as siren warnings were sounded, the remaining personnel trooping to air raid shelters. The present-day Progress and Invoicing Departments at H.O. were rest room and dormitory respectively for night-time ARP teams.

Arbroath, itself, was paid scant attention by the enemy despite the two Naval Air Stations and large number of troops in the vicinity and the fact that it was a munition-making centre. Being on the coast brought risks from British and German sea mines washed ashore and subsequent explosion. One third of Arbroath personnel were called up; others volunteered for the Local Defence Volunteers (later

the Home Guard), a Factory Unit being organised and defence posts set up at strategic points in the works.

Manchester Office was worst hit of all. During the great fire blitz on the city on the night of December 22nd-23rd, 1940, the office at 4 Cannon Street was completely demolished. Temporary accommodation for about three weeks was made at the home of the late Branch Manager, Mr. J. C. R. Watson, prior to the move into new offices in the Manchester suburb of Sale. That same day an incendiary bomb fell on these offices but succeeded only in destroying a few tiles in a toilet before being discovered. Needless to say the complete loss of all records coupled with depleted staff due to call-ups made difficult and trying conditions even more so.

Of those who were called into the Forces nine Arbroath and nine Tottenham personnel lost their lives. The Arbroath men were W. Bremner, L. Falconer, M. Gilmour, H. Griffiths, N. Lundie, A. MacDonald, S. Morrison, W. Smith and D. Webster. Those from Tottenham were H. G. Atkinson, L. Brice, A. W. Coleman, A. Cooper, D. Dushman, R. A. Hurst, F. Richards, H. Rudelhoff and C. Wright.



One of our war-time productions was the combined ventilating fan and anti-gas filtration unit pictured above. Plants of this type were supplied to counter the humid, unhealthy atmosphere in air raid shelters, and were either electric powered or manually operated.

The Company sustained six serious losses, also, among long-serving executive personnel during the war years. Mr. J. W. Hampsheir (Director and General Manager) who was appointed to the Board in 1921, died in 1941; Mr. W. B. Davidson (Arbroath Works Manager) in 1943; Mr. George Keith (Chairman and Managing Director) son of Mr. James Keith, and a Director since 1909, died in 1945; Mr. W. B. Richards (Director and General Manager) who in 1929 was made a Director and Technical Manager, died in 1945. Two other executives passed away during this same year—Mr. P. W. Kerr, Chief of the K. Dept., and Mr. J. A. Spray, Production Manager at Tottenham.



# THE KEITH BLACKMAN STORY

Part 8

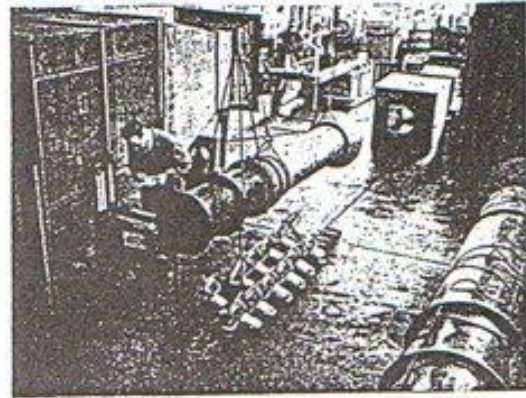
WE HAVE TRAVELLED FAR and spanned some hundred and twenty-two years in this series of articles, tracing the growth of the Company from 1823 to the end of the last war. In this period we have been prime movers in the development of many and various types of machinery invariably associated with the movement, treatment or efficient usage of gases. What of today? Apart from standard lines and other equipment which demand has shown to stand the test of time, what developments have emerged since 1945? What major changes have taken place in the last thirteen years?

Let us think first in terms of new products. As a result of constant research, the aim of which is and always will be to maintain our position in the field by producing equipment second-to-none in every respect, significant improvements have been made in every basic fan type. Consider firstly the axial fan range alone. One of the first developments in this period was the 8 bladed axial, often known as the 1946 pattern streamline fan, which appeared on the scene to supplement the seven bladed HE axial which is today unchanged since its inception. One of the advantages of this new fan was the fact that it could, if required, operate as a ring mounted fan thus closing the gap between axial and propeller types.

A few years later, an interesting development came into being in the shape of the Bifurcated fan which might well have been heralded as "the answer to the fume removal expert's prayer." With its motor completely isolated from the airstream giving first-class protection and accessibility, it rapidly became popular with the industry in general and has been installed in an amazing variety of applications. Amazing, too, have been the misnomers applied to this versatile fan! Any member of the V.D. will confirm that it has been described as "Spificated," "Trifurcated," "Bifuriated," "Bifabricated"—practically everything else but Bifurcated.

Nineteen hundred and fifty-three was indeed an important year for it saw not only the development of the AFX fan, a

most versatile axial with its externally mounted motor, but was also the year in which the stock system was introduced. After the five years which have elapsed since, we can claim with pride that we now hold stocks of the largest range of fan engineering equipment in the world in spite of the rapid turnover due to sales.



View taken in Tottenham's Axial and Propeller Fan Research Dept.

The following year was also of considerable moment, particularly so far as the axial field was concerned. This was the year in which the research department opened its separate and self contained axial research department. Subsequent research resulted during the first year in three new types emerging:—the pivot roller axial with its inherent accessibility characteristics so essential for marine applications; the adjustable and variable pitch axials which made the existing range much more flexible and in fact superseded the older 8 bladed type, and the A.P.A. type propeller fan with its double curved anticlastic impeller giving improved outputs and quieter operation.

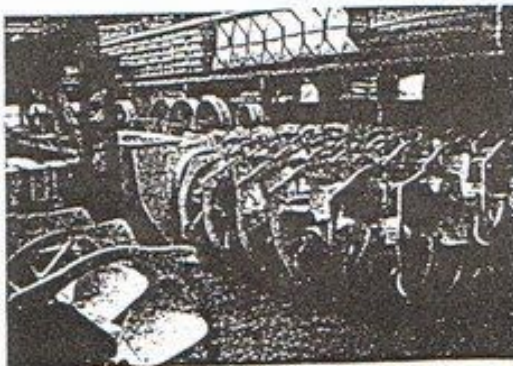
Apart from these important advances there has been a continuous flow of development work on the multiplicity of special pattern fans required by the Admiralty for the latest warships.

## The new hybrid fan

One of the Company's most recent developments is rather difficult to classify as either axial or centrifugal. What better reason, then, for calling it the "Ax-Cent." With some of the design features characteristic of both types, this new development may well make another valuable contribution to fan engineering and open up its own new field of application.

Centrifugal fans, too, have received much attention during the past thirteen years and the most outstanding developments are without doubt the type AR aerofoil section bladed

Continued on page 4



Part of Tottenham's finished goods store.



## The Keith Blackman Story.

fans and the new "Tornado" centrifugal fans, which will without doubt prove to be another major step forward in our own field of engineering.

The type A.R. is, of course, now well established as a basic centrifugal type with extremely high efficiency, ideally suited as mechanical draught fans for power stations and for general ventilating applications.

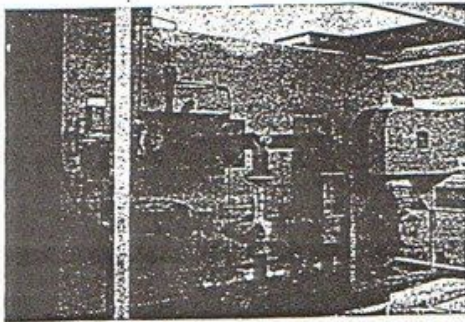
"T" type dust units were conceived and developed at Tottenham during this progressive period. Utilising a high efficiency impeller combined with a series of filter bags, being completely self contained with inbuilt starter and taking but little floor space, these units have proved to be a great boon to a wide range of industries in the collection of objectionable dusts from all manner of processes and, in particular, grinding operations.

Another intriguing and comparatively new item of equipment is the 4-way welding fume removal unit. With its potential of four extraction hoses capable of dealing simultaneously with sources of welding fume annoyance up to 60 ft. apart and its extraction hose discharging at a safe distance from the welders, it has greatly improved conditions for many operators working, for example, in the confined spaces of ship's holds, the interiors of boilers, large tanks and other fabricated vessels. Not only does this unit improve working conditions—it also acts as a safeguard to the health of welders and encourages increased productivity.

## Polyvinyl chloride fans

In both centrifugal and axial work recent years have seen the introduction of a new material—p.v.c. and much has been done to combine our wealth of experience as fan designers and manufacturers with this now widely used product of the chemistry laboratory resulting in our series of plastics fans—the series I & II centrifugals and the Bifurcated fan. The fume removal problems of yesterday, and big problems they were, are considerably lightened today with the availability of these new "tools."

Present day dust problems are dealt with by the most recently introduced research department established towards the end of last year with dust filtration and clean air its sole purpose.



Gas-fired scroll heater for car body paint drying made to manufacturer's specification

## The Keith Blackman Story

Continued

last year, is now quartered at Tottenham and is, therefore, to advantage, in immediate contact with the engineering and administrative side of the parent company. New agents have been appointed in Canada to increase sales in this top priority market.

The industrial gas apparatus manufactured by the Company has also made considerable advances during this period of little more than a decade and of some twelve new items of equipment produced, those most deserving of mention are the type 3 zero governor, the type 3 mixture controller, the high pressure shut-off valve, the high pressure cut-off switch and, of course, the oil separator for air and gas streams up to 10 lbs. per sq. in.

New applications of gas equipment have also been discovered which in themselves are worthy of note. These range from special scroll heaters handling large volumes of air and applied to the drying of motor car bodies after painting, to pig and wood branding. The latter is a vast improvement over the old electrical method since it has increased output from one brand every six minutes to seven brands every minute!

From this impressive array of inventions, achievements, developments and other outstanding events it is difficult indeed to select any one as being more important than the others. However, looking to the future, it would seem likely that the new acoustics laboratory qualifies for this honour. Completed in July 1957 it is usefully employed in investigating what has been until recently a neglected science. Its work is closely integrated with that of our other research departments and can make a great contribution to fan design of the future.

What now of changes which have taken place since 1945? A programme of reconstruction and re-equipping the works and increasing the "built on" area at Tottenham has led to increased production capacity, vital in an expanding market. The move to the 35,000 sq. ft. factory at Edmonton of the sheet metal shop provided not only greater freedom of movement for Mr. Dullage's men, the nature of whose work necessitates more square feet per man than for any other trade, but also permitted a general reorganisation of Tottenham's workshops to take full advantage of the space made available.

The importance attached to research, the key to our future prosperity, may be gauged by the fact that thirteen years ago two departments existed to handle this essential aspect of the Company's activities. Today there are six separate research departments or laboratories fully engaged in improving the products of the present—bringing nearer the products of the future.

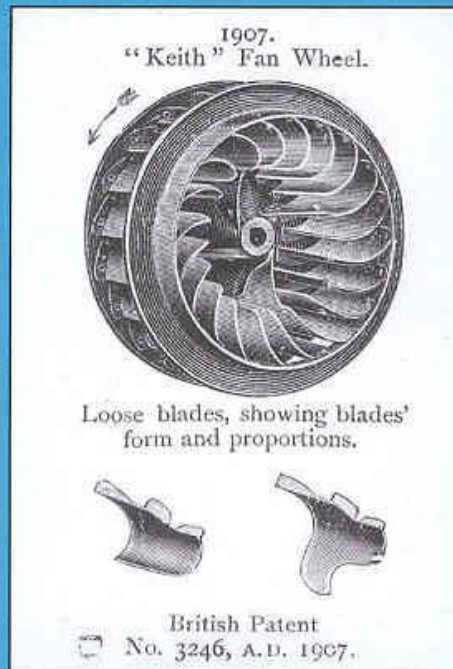
Our association with Cupodel Ltd. whose hot blast cupola plants have revolutionised the manufacture of cast iron in some of the U.K.'s most modern foundries, is a striking example of the Company's ramifications now compared with the immediate post war years. So too is the shot cleaning system of maintaining heat exchangers in a deposit-free condition, which is being supplied to the steam-raising and foundry industries. It is made under licence from the Swedish engineering organisation Broman Ekstrom.

Every year production increases and with it the sales force. Apart from a growing staff of sales engineers based at Head Office it has been necessary to open up new branch offices at Bristol and Leicester. Premises occupied previously by the Blackman Export Co. Ltd. in London have been taken over by the London Area Sales Office. The Export Company itself, which became a subsidiary of Keith Blackman early

on page 10

It is indeed a far cry from the days of the first Mr. James Keith's small engineering workshop on the east coast of Scotland and from the Blackman Air Propeller Company's introduction to London of the "mechanical contrivance for moving air." If it were possible we feel, somehow, they would be rather proud of the organisation which has been built on the foundation laid by them so many years ago.





**Keith Patent Fan Wheel of 1907.**



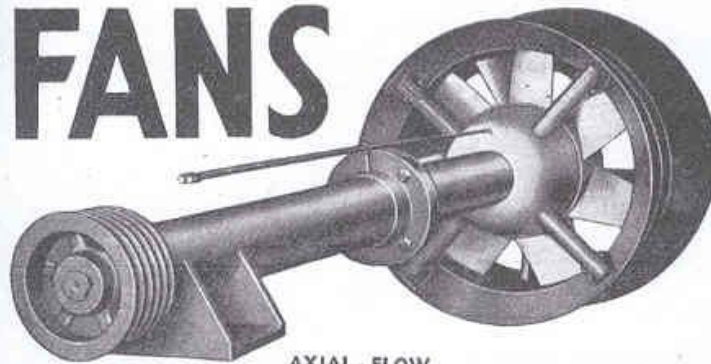
**Keith Patent Fan Wheels of 1908.**

**James Keith merged with Blackman Ventilating to form Keith Blackman.  
[The Origin and Progress of Multiblade Fans, "by a Technical Expert," 1911]**

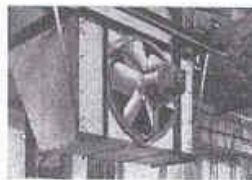
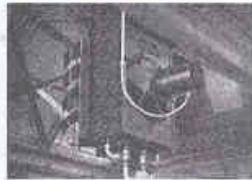


**Keith Blackman Ltd**

# FANS



AXIAL-FLOW  
PROPELLER &  
CENTRIFUGAL

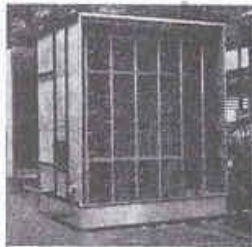
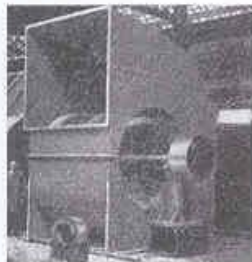


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And at Manchester, Birmingham, Leeds, Newcastle/Tyne, Glasgow, Cardiff, Belfast

Fans, Keith Blackman, Tottenham, London N17.  
[Year Book of the Heating and Ventilating Industry, 1948]