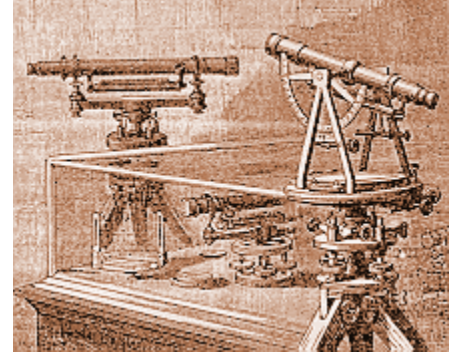


James W. Queen & Co.

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Thirty-five years ago, Mr James W. Queen, a gentleman of scientific attainments and great business ability, began in the city of Philadelphia a small business in optical and philosophical apparatus. In 1859 he associated with Mr. Samuel L. Fox, and under their personal supervision and management, the business steadily developed and quickly outstripped similar establishments. In the year 1870 Mr James W. Queen withdrew, and Mr. S.L. Fox continued and still continues the business under the old title of James W. Queen & Co. Different branches were gradually added until the business became the largest and most comprehensive of its kind in the United States or in the world. The progress and development of this business is, without doubt, a fair index of the scientific progress of this country. In time the business became so large that it was found necessary to arrange the different branches under different departments, with a competent man at the head of each department.



There are at present six departments, arranged under the following heads: physical and chemical, engineering, ophthalmic, microscopical, the magic lantern department, and the photographic department. The headquarters of these departments are at 924 Chestnut Street, Philadelphia, at the site occupied originally by Mr. Queen. But, the business having enormously outgrown the building, some departments were obliged to seek quarters for apparatus in other buildings in the vicinity of the main offices of the establishment. The factory in which are made a large proportion of the instruments and apparatus sold by Queen & Co. was long ago removed to more commodious quarters, now occupying a floor extending through a city block and fifty-five feet in width.

Although the importation of fine instruments for demonstration and for commercial use is a large and important part of the business of the concern, the manufacture of such instruments has reached proportions which can hardly be appreciated without a visit to the shops.

One of our illustrations [Queen factory](#), gives a truthful representation of the place wherein are made scientific instruments in such great variety as to render it impossible for us to even enumerate them. We may, however, mention a few of the leading articles. A great deal of work for the government is done in this place. The apparatus for the Signal Service is largely furnished by Queen & Co. One of the features which first attracts the attention of visitors to the shop is a machine for testing anemometers. A pair of anemometers are attached to a long beam, which is rotated at a known velocity. This is, of course, the equivalent of causing the air to pass the anemometers at the same velocity. By means of the rotating beam the instruments are carried through the air at different velocities, ranging from a fraction of a mile per hour up to the velocity of a cyclone, and the instruments are adjusted to accurately indicate and record the velocity.

The thermometers and barometers used by the government are made here. An order from the government for a large number of microscopes of special design for testing certain adulterations of food has recently been completed.

The microscopes of the various "Acme" patterns are made here, these being finished up in lots of from 25 to 50 of a kind; many of the parts are made up by hundreds at a time. As the best drawn steel pinions to be found in the market have proved to be of insufficient exactness to make a perfect rack and pinion movement, all the pinions and racks used here in the manufacture of microscopes are cut by fine machinery specially adapted to this work. To secure perfect smoothness in motion, each rack and pinion is "ground in". The making and adjustment of the rack and pinion is one of the most vital points of a microscope; indeed, it is an art of itself.

Engineering instruments are made here in large quantities. Transits are generally made in lots of 25, levels in lots of about 75. By carrying on the manufacture of instruments in large lots, the quality of the work is not only kept up to a high standard, but the workmen acquire such dexterity as to greatly reduce the cost of labor on these instruments.

To secure the quality of brass and bronze castings required in the manufacture of the instruments, it was found necessary to add a brass foundry. Phosphor bronze and aluminum bronze enter largely into the manufacture of many of the engineering and physical instruments.

Among the instruments and apparatus being made, we will mention air pumps, induction coils, separable induction coils, Holtz machines, gyroscopes, drawing and mathematical instruments, and instruments for electrical measurements. It is a mistake to suppose that all these instruments are designed only for institutions of learning. A large proportion of them are specially designed for practical, everyday use in connection with regular manufactures and electric lighting.

Much of the apparatus is of new and original design. The work done in the designing department covers almost every kind of apparatus for the illustration of the laws of physics and chemistry in their various branches. The designing of such instruments requires not only great mechanical ability, but also a thorough knowledge of the laws which the instruments are intended to illustrate, and must therefore be carried on by men of education and special talent.

While all the apparatus might come under the general heads of physics and chemistry, there is a special department (No. 4) devoted to these sciences with their various branches, as exemplified in apparatus for research and practical use. Under this head comes the department for electrical instruments, galvanometers, bridges, resistance coils, reading telescopes, ammeters, voltmeters, and similar instruments, which include those for the most careful research, as well as for the use of the practical electrician in the dynamo room. This particular branch of the business has grown to very large proportions within the last few years and is now very complete.

The sale of ammeters and voltmeters, both for scientific measurements and for practical work, is one of the specialties which has assumed large proportions, and they sell to universities, electric lighting companies, users of batteries, dynamo machines, in short, to all of those industries where the ammeter and voltmeter have become as necessary as the steam gauge. It is perhaps well to

mention that Queen & Co. are sole agents for the popular and well known Ayrton & Perry instruments for electrical measurements.

Under the head of physics and chemistry is included another department, comprising anatomical and botanical models in plaster of Paris and paper mache. This branch includes a large and fine collection of manikins and models of different physiological subjects from well known European makers. They also include some entirely new and beautiful botanical models. Some of the novelties of this department are the models in gelatine of budding yeast, after Koch, and of lower forms of life, bacilli, etc., which represent the subjects as they appear when magnified 25,000 diameters

Among the most interesting things in the department of physics are the new forms of polariscopes for the table and for projection, and the exquisite specimens arranged to be used with these instruments.

The new form of Toepler-Holtz machine made in this establishment deserves more than just a passing notice. It generates electricity in all weathers, is always ready for immediate use, and yields torrents of sparks.

In this department, we also notice a new air pump which gives vacuum of $99 \frac{3}{4}$.

In the chemical department a specialty is made of the importation of balances for all purposes, including very fine analytical balances, some of them sensible to the twentieth of a milligramme. The stock of chemical glassware, pure chemicals, platinum, etc is large and complete.

In the department of engineering are found transits for railroad engineers, city work and general surveying, engineer's and architect's levelers, plane tables, surveyor's compasses, leveling rods, chains, and all other instruments required to complete the outfit of the engineer, either for reconnaissance or for the final work of laying out the line of a railway or boring a tunnel. We are informed that these instruments are sent to every part of the world. In this department are also made the elaborate and costly instruments of precision used principally by the United States government, such as standard comparators for the testing room in the United States Signal Service, and standard ruling and engraving machines for the United States Hydrographic Office. The firm, besides being large manufacturers of engineering and drawing instruments, are large importers of these articles.

The ophthalmic department, which is known as Department No. 1, embraces all the apparatus and appliances used for the examination of the eye, and includes spectacles, eyeglasses, opera glasses, etc. It is one of the largest branches of the business. The lens grinding room is devoted almost exclusively to making what are known as "prescription glasses", which are required to be ground specially to order. This department is particularly interesting, as here the process of making lenses can be traced from beginning to end. The number of prescriptions which come in daily through the mails and otherwise from all parts of the country indicates the importance of this part of the business. It is surprising to note the variety of defects in the eye which are corrected by special glasses. These prescriptions are prepared from measurements. The old way of fitting the eye by trial is now almost discarded. In this department are made ophthalmoscopes,

by means of which the interior of the eye is illuminated and examined by the physician. Also made are other ophthalmological apparatus, such as perimeters, trial frames, test cases, prisms, etc.



In the department known as No. 5 may be found astronomical instruments and apparatus for projection. The astronomical branch comprises refracting and reflecting telescopes, the stands and other accessories required for practical observation, microscopes, helioscopes, spectrum attachments, eyepieces, transits, sidereal clocks and chronographs, which are particularly designed for schools and colleges. In the branch devoted to projection there are various forms of lanterns which are under the names of sciopticons, stereopticons, college lanterns, for entertainment as well as for instruction. Some of these lanterns are provided with powerful petroleum lamps of new design, which compare favorably with other illuminators. As might be expected in an establishment like this, a large stock of pictures for use with the lanterns, embracing educational views,

diagrams, and pictures of various physical apparatus are kept on hand.

The photographic department, although a comparatively new one, shows all the spirit and enterprise which characterizes this establishment, having within five years introduced many articles of value to photographers, the most important of which are the well-known Queen-Francais photographic lenses, indorsed by the highest authorities, and the Queen pantagraph lenses, which are designed to supply a lens of good quality at a reasonable price. This department has also commenced the publication of a magazine entitled "Science of Photography".

It is impossible to fitly describe in detail all departments of a great establishment like this. Each department is a little world in itself, covering many branches, each of which in turn includes many sub-branches. The firm, in addition to the catalogues of their own productions, make a specialty of securing catalogues of all foreign makers of apparatus in different branches of science, and of keeping informed as to the scientific and practical knowledge and apparatus of the day, so that they may properly be considered a bureau of information for those who choose to avail themselves of its advantages.

In 1893 the name changed from Jas W Queen to Queen & co and the highest serial number I have found for Jas W Queen is 5283 and the lowest for Queen & Co 5498 so assuming a yearly production of 100 instruments