

Followspot Lighting of Theatrical Productions

(a very condensed history)

Of course, the lighting of theatrical presentations was first performed outside in daylight, but with the advent of enclosed stagings there was need for artificial light. Candles and/or oil lamps supplied this light . . . and in many cases much smoke and soot. By the early to mid 1800s gas, in the guise of oil gas or coal gas, was beginning to be used for public lighting and in private homes as well as in theatres. Although candles and oil lamps were still to be found in some situations (even in 1850). In a relatively short time frame, gas lighting was the subject of huge advances in design of the burners so giving better light output, control of this output and the ability to change the colour of the light produced (to suit the “mood” of the scene). A major disadvantage of the use of a naked flame was the ever-present danger of a performer’s costume catching alight. Indeed, there were many situations when this occurred. Theatres burning to the ground happened fairly often too.

The Evolution of the Followspot

About 1840 a method of producing a very intense, bright white light was transferred into the theatre from the realm of Land Surveying. It had earlier been discovered that if a gas flame produced by a mixture of Hydrogen and Oxygen was played onto a block of Quicklime, it would “glow so brightly that a hand held near a wall at 10 miles distant would throw a shadow”! This was ideal for long distance establishment of survey points when used at night.

In the theatre the “**Lime Light**” was at first put into a box with one side open and that box was mounted so that the light it produced flooded a stage area with its bright output. Soon a light proof box with a suitable glass lens in an orifice at the front enabled the light to be focussed and so its spread (and light “spill”) could be controlled, coloured and shut off at will by the operator. The box was fitted with gimbals that allowed it to pivot both horizontally and vertically. So the operator could follow the principal actor about the stage with a concentrated beam of light. Of course the self centred actor did all he/she could to be the subject within the bright light (making him/her stand out above all others) . . . Hence the saying that’s still in present day use, “he loves being in the lime light!”. Limelights using a focussed beam were still in use in the 1860s even though there had been other technical advances in **Followspots** in the preceding years.

There was, as usual, quite some overlap in the years of the technology improvements, but electric light was becoming well established in theatres by 1860-70. The power required was often produced on the premises with banks of Dry (primary) cells or Wet cells (secondary) in the “electric room” or later a gas engine might have been used to drive a dynamo. The electricity produced was “Direct Current” (DC) and ideal to be utilised for producing an electric arc, or flame, inside a Followspot. The arc light principle worked like this. If a circuit is completed between two carbon rods, current will flow through the joint. Then, if the rods are slowly drawn apart, the electricity will continue to flow by jumping the gap (provided the gap does not become too large!). The resultant “flame” is so intense and hot that the tips of the carbons will glow white-hot. Some of the light from this extremely hot region is focussed through the lens . . . just as with the Limelight. Light and heat that doesn’t reach the lens directly is absorbed by the housing, which can get very hot.

Present day Followspots utilise (comparatively) efficient, specialised, light producing electric lamps with built in reflectors that reflect the light output while allowing the majority of the heat to pass through the back of the reflector where fans eject it. This makes for much improved working conditions for today’s operator. The lens system is made up of multiple lenses capable of being moved relative to each other for perfect sizing of the circle of light produced. There are several colour change frames readily accessible to the operator as well as special shutters for shaping the beam coming from the Spotlight. Importantly there are also devices for dimming or shutting off the light without having to turn the light source lamp off.



Kliegl Brothers Carbon Arc Follow Spot (circa 1915)



This partially restored Followspot and another, were probably bought as part of the latest lighting equipment a few years after the Palmerston North Opera House was built (in 1904). They had been in use there for very many years, but were put into a storage area when a pair of (then), new and modern Rank Strand 765 Followspots were purchased to replace them. This particular lamp was eventually rescued from being consigned to the dump when the Opera House was demolished in 1996.

The arc that produced the intensely bright light between the carbon rods was probably created by 240 Volt, DC electricity. This was generated on the premises by a belt driven dynamo powered by a town supply coal gas, single cylinder engine. The engine room was way out the back of the theatre so as to isolate the engine's noise. It also doubled as the Crew Room where the "backstage boys" had their cups of tea out of filthy mugs!

Originally the wire connection to the arc lamps at the lighting positions was achieved by a couple of exposed copper (or maybe they were brass) bolts with wing nuts, protruding through what appeared to be a wooden block mounted on the brick wall! They were still there (but disconnected of course) until the Theatre was demolished).

Details to Note:

With the access door open, the carbon rods can be seen clamped to the mechanism that enabled the operator to adjust the arc gap (the rods gradually burnt away). Most people will be aghast at the "classy" wiring of this "up to the

minute" bit of theatrical gear . . . the present Occupational Safety and Health people here in NZ would flip! Not very thick layers of a thin, brittle material called Mica achieved the electrical insulation!

There is a peephole in the housing door that has a very dark glass in it. This hole was used to allow the operator to peer into the lamp so as to keep the carbon arc "flame" in the optimum position and the carbon rod's gap just right to give the best light output. This gap was kept maintained by manipulating the knob under the lamp housing.

It can easily be seen how inefficient the light source was . . . just look at the burned paint that has been left "as found" inside the lamp housing! In fact a overheated operator has added an extra "skin" to the access door at some time . . . A modification that would reduce the heat radiated onto him. No wonder the operators of these lamps were known for drinking lots of beer!

The light spot size on stage was controlled by another knob on the rod that protrudes out the back. This allowed the operator to slide the whole assembly back and forth in relation to the simple plano/convex lens.

All this controlling had to be attended to and more (colour changes and reading a cue sheet, for instance) at the same time as not being able to glance away from the actor that is supposed to be kept constantly centered in a pool of light . . . It's amazing that so many people thought it was such a cushy job, as the operator got to see all the shows . . . for free! In reality it was a brave (or foolish!) operator that dared look outside that cylinder of light and the spot at the end!

Grateful thanks are due to Noel Foot (long time spot operator) for rescuing the lamp, Central Glass and Hobbs Cobblers for their expertise and material supply. Leo Bolter, Followspot Operator for about 30 years, did the partial restoration in 2011. He also researched and wrote these documents in September 2011.

From Kliegl Bros Catalogue (about 1915)
238 - 240 West 50th Street, New York. XI.

MOTION PICTURE SPOTLIGHT.

The new style lamp is superior to any other spotlight for light throwing at long distances. It is designed to give a 3-ft. spot at a distance of 100 feet as well as a 20-ft. spread.

This lamp is neat in appearance, efficient and compact in construction. The hood is made of Russian iron with aluminum front and rear, with large side door on spring hinges, and grooves for color slides or color wheel.

It carries a special arc lamp focusing frame for quick focus, which is controlled by rear wood knob, allowing the operator to change quickly from spot to flood or vice versa without unscrewing set screws or handle. The arc lamp burner is hand feed for A. C. or D. C. current, and is operated by wood knob under hood. The lens used is 6" in diameter of a special focus. The hood is well ventilated and thoroughly light-tight, and is fastened by swinging attachment to a telescopic iron stand with enclosed rheostat, detachable switch, asbestos wire and 25 ft. approved stage cable.

MOTION PICTURE SPOTLIGHT.

25 Amp. 125 Volts.

| Fig. | | Price. | Weight. | Code Word. |
|------|--------------------------------|---------|---------|------------|
| 9 | 6-inch Lens Box..... | \$50.00 | 68 lbs. | Betake |
| 22 | Color Wheel..... | 3.50 | 2 3/4 " | Blush |
| 289 | 6-inch Lens, plano-convex..... | 2.80 | — | Glebe |

25 Amp. 250 Volts.

| | | | | |
|----|----------------------|---------|---------|-------|
| 9A | 6-inch Lens Box..... | \$60.00 | 81 lbs. | Belch |
|----|----------------------|---------|---------|-------|

