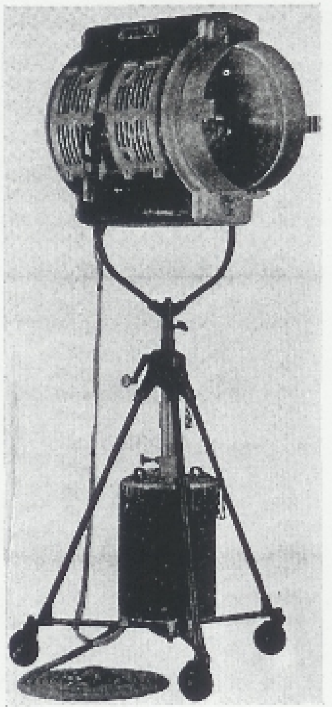
Production Use Tested the "Ultra H. I. Arc"

By ELMER C. RICHARDSON,
(*Mole-Richardson, Inc.*)



IT is not often that a new piece of cinetechnical equipment can be proven by actual use on an important production before its introduction to the industry. Yet the ultimate proof of equipment is its practical utilization; a single day's work on the set can often reveal flaws which pass undetected through the most exhaustive of laboratory tests.

The Mole-Richardson "Ultra H. I. Arc" spotlamp, which makes its formal bow to the industry this month, is one of the few devices which has had the advantage of being previewed on actual production. One of a series of new arc lighting units designed and built especially to meet the requirements of Technicolor's three-color process, the "Ultra H. I. Arc" emerged from the laboratory-test stage of its development just as Cinematographer William Skall, photographing Pioneer Productions' "Dancing Pirate," needed a battery of high-power arc spotlamps to illuminate a sequence of important dance numbers on an unusually large set. The new lamps went to work immediately; and so successful did they prove that instead of returning to the factory for further testing or modification, they stayed on with Skall to finish the picture. The announcement of the new lamps has, in fact, been withheld until the completion of the production proved beyond doubt that no slightest change was necessary to make them, to arc lighting, what the "Solarspot" has been to the incandescent field.

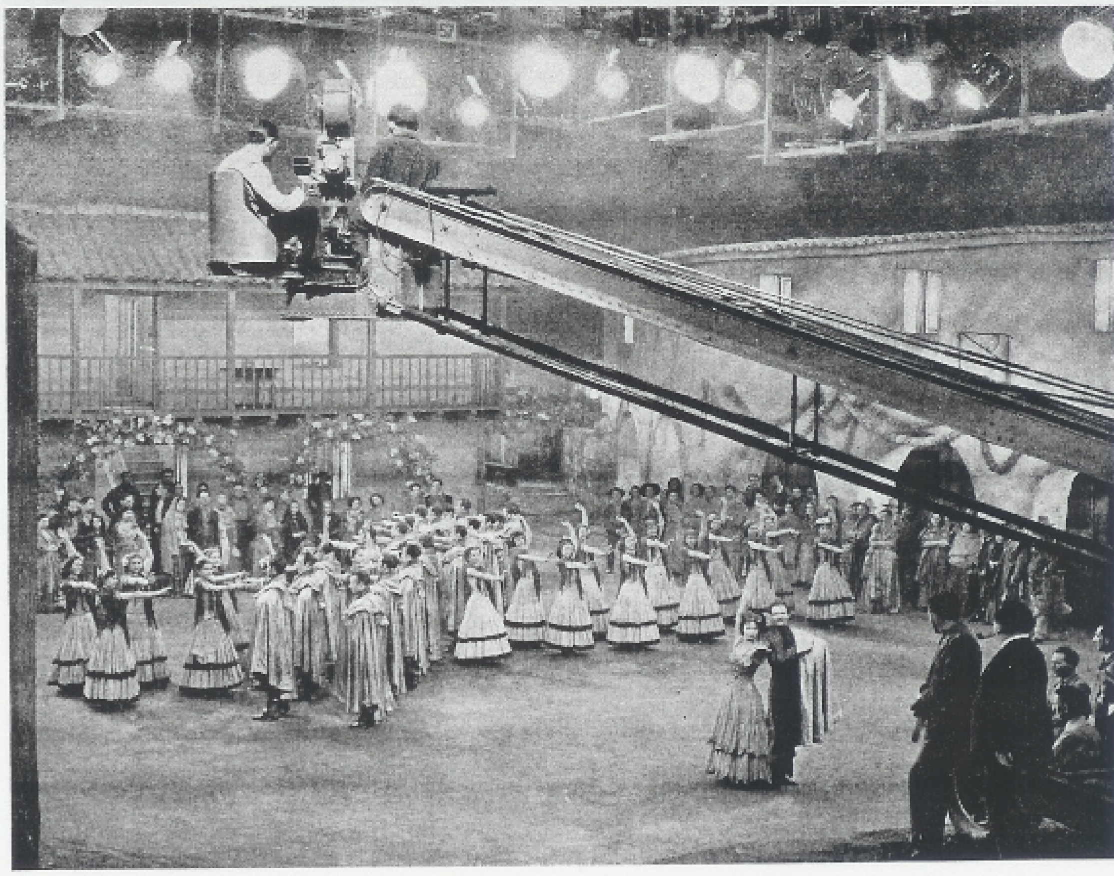
The "Ultra H. I. Arc" is a 150 ampere, high intensity rotary carbon arc spotlight. Scarcely half the size of a conventional 36-inch Sun Arc, the new lamp, at normal working beam-spreads, considerably exceeds the "36" in power. As it is fitted with a "Morinc" lens of the same type as the one used on the "Solarspot," the light is distributed with almost perfect uniformity at all beam-spreads from the tightest spot-beam to a maximum flooded spread of 48 degrees. A newly designed carbon-feeding mechanism gives an unequalled steadiness of burning, and special carbons give a light considerably whiter than is usual in high-intensity arcs.

The design and performance of the "Morinc" lens is familiar to every "Solarspot" user. With this type of optics, it is not only possible to use a faster lens, of shorter focal length, thereby collecting the light more efficiently, but to give each individual zone of the lens the curvature best suited to the work assigned to it. Thus it is possible to overcome both the inherent inefficiency of conventional condensing-lens spotlights, and the optical aberrations which produce dark centers in the flooded beams of conventional reflecting spotlights. The use of this type of optical system to collect the light from a high intensity arc eliminates the objectionable element-shadows seen in most mirror-arc spotlights, since the elements supporting the carbons cannot cast their shadows into the beam.

In designing the carbon-feeding mechanism, two important ends were sought: Silent operation, and steady burning. The use of silent gearing in the carbon-feeding drive has silenced the mechanism of the "Ultra H. I. Arc" to a point where both laboratory tests by recording engineers, and practical use on the set have proved that the lamp can be used, with the feed operating, within ten feet of the microphone.

Steady burning is achieved by careful attention to detail in the design and operation of the carbon feed. In a high intensity arc, the major portion of the light comes from a glowing ball of incandescent gas which forms in the crater of the positive carbon. If the positive crater is not symmetrical, this gas-ball will waver, and the light will be unsteady. Research into this crater-formation showed that regardless of the carbons used, or electrical safeguards employed, if the carbon rotated too slowly, the crater could not be kept symmetrical. Accordingly, in the "Ultra H. I. Arc," the carbons are rotated at a speed considerably higher than has hitherto been customary. Intermittently feeding a carbon, in addition to creating noise, will be likely to disturb the symmetrical maintenance of the positive crater and the constancy of the gas-ball. In the "Ultra H. I. Arc," the carbons are not only rotated faster, but fed continuously. As a result, the light-flux does not vary in excess of plus-or-minus five per cent during a burning period of twenty minutes.

Since the advent of sound, it has been customary to provide a means of temporarily stopping the carbon-feed to quiet an arc when it is used close to the microphone. This will inevitably disturb the steadiness of the light; therefore in the "Ultra H. I. Arc," thanks to efficient electro-mechanical silencing, the feed does not need to be stopped; it can, how-



A shot from "Dancing Pirates," Pioneer Pictures. On the swinging boom is Will Kline with a Technicolor camera. Director Lloyd Corrigan is the gentleman with the pipe and William Skall is at his side. Note the lamp rail with the old M-R 36 Cineart lamps and the new M-R-Ultra H-I-Arc lamps. The big lamps diffuse only about 1/3 the light of the smaller ones. Bill Thomas, stills.

ever, be retarded when necessary, without seriously impairing the constancy of the light for short periods.

The "Ultra H. I. Arc" is quite similar in appearance to its smaller companion-unit, the 120 ampere "H. I. Arc," and only slightly larger. All operating controls are conveniently grouped at the rear of the lamp-house, and the auxiliary grid is demountable, so that the lamp and its grid may be handled separately when the lamp is put on a parallel or overhead lamprail. The elevation of the lamp on its pedestal, instead of being affected by the usual telescoping tubes and clamp collars, is controlled by a convenient crank, operating the lift through irreversible gears.

In actual production use, the lamp was found to be all its designers expected. Designed around a 20-inch lens, it is obviously more compact than the 36-inch mirror Sun Arcs with which it was used, and thus it could be used in places where a larger lamp could not be set up. When high levels of illumination were needed, a space which would be crowded with two Sun Arcs proved ample for three "Ultra H. I. Arcs," and the sections where there was not enough room for two of the big reflector lamps (though their light was needed) sufficed generously for a Sun Arc and an "Ultra H. I. Arc." The wider range of useful beam divergences proved valuable, and the flatter field of the new unit's beam did much to simplify the problem of lighting the big, stage-built exterior sets.

The silence and simplicity of the new units won the favor of both the sound and electrical crews. Retrimming, focusing adjustments, and the like were much easier, especially on the crowded spot-rails; and as one of the recording staff phrased it, "The Ultras are the only big lamps that we never hear!"

Actual use also proved that at all working beam-spreads—divergences of 18 degrees or over—the new lamps, for all their compactness, produce a beam averaging more than 40 per cent greater intensity than that of the Sun Arc. The elimination of the central shadows in projected beams obviates the need for much corrective diffusion, inevitably increases this margin. In a word, actual production