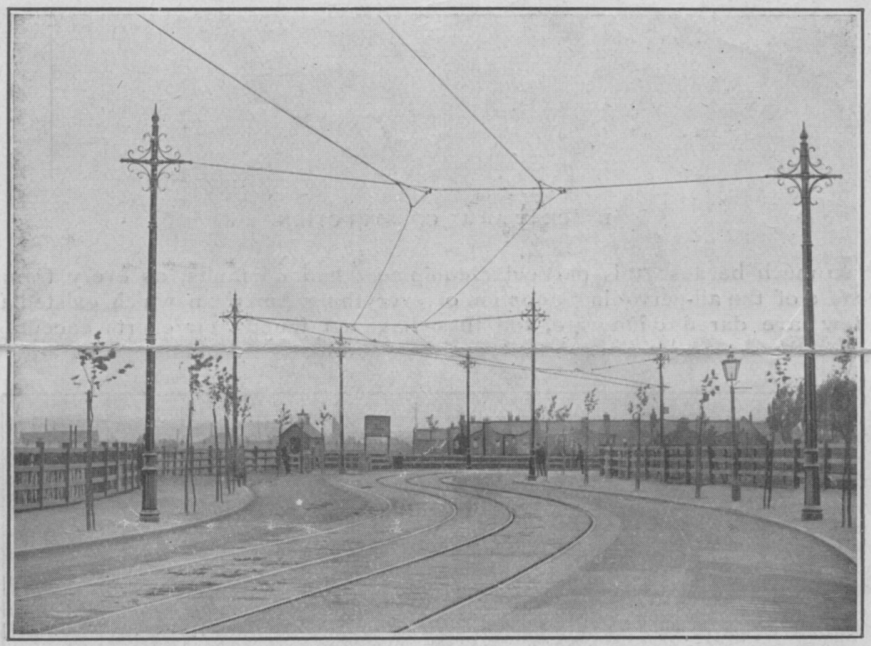
TANGENTIAL SUSPENSION



A TYPICAL EXAMPLE OF FLEXIBLE SUSPENSION.

Geo. W. GREEN & Co. (Feltham), Ltd.,

Q-FEL WORKS,

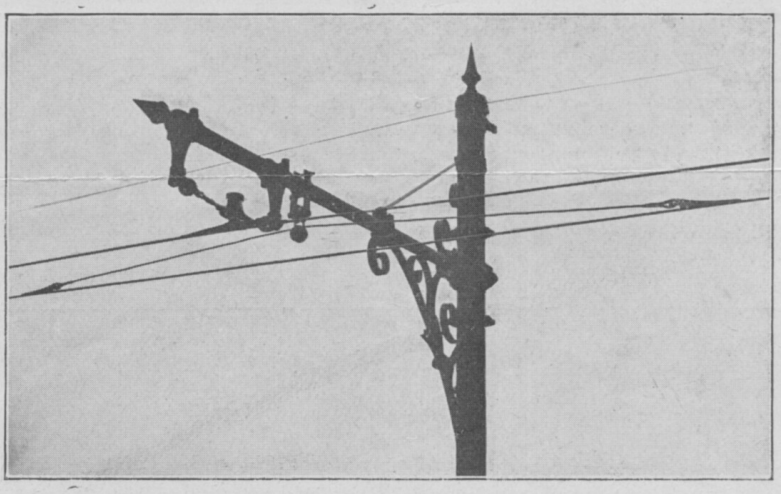
MANUFACTURING ENGINEERS,

FELTHAM, MIDDLESEX, ENGLAND.

Telegraphic Address—"Cufel, Feltham."

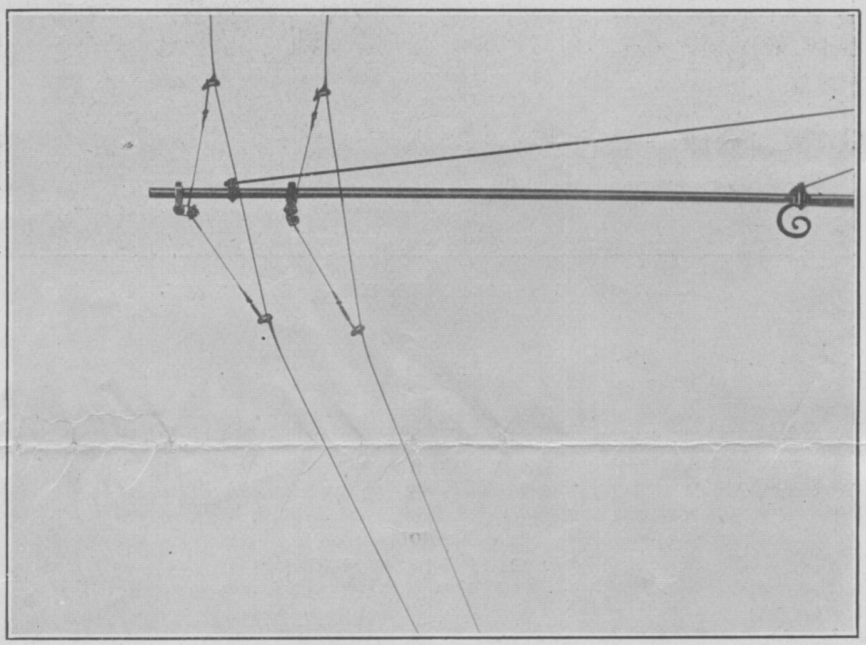
TANGENTIAL SUSPENSION.

ALTHOUGH some twenty years have elapsed since electric tramways began their career in this country, it is surprising that so little departure has been made from the American practice and type of overhead fittings then introduced.



BRACKET-ARM CONSTRUCTION.

This is not so much because this particular equipment had no faults, as every tramway manager knows, but because of the all-pervading adoption of everything American which existed at that period. Since then but few have dared to innovate, and these have not found their efforts encouraging. Some, however, have greatly ventured and stuck to it, and are rewarded by finding the natural inertia giving



SHOWING MEDIUM BENDS ON BRACKET ARMS.

way. This is particularly the case with one of the principal innovations in overhead equipment, namely, the flexible suspension of tramway overhead wires on a scientific basis.

One of the principal troubles with which every tramway has to contend is the breaking of the trolley wires without apparent cause. One of the first remedies was the introduction of grooved and figure 8 wire, but, although this certainly diminished the trouble, it by no means eliminated it. The cause of the

trouble was generally believed to be due to the use of fouling ears, and that when these were removed the trouble would disappear with them. It certainly was a contributory cause, but by no means the whole or even the greater part. There is little doubt that the cause of breakage of trolley wires is due to vibrations which travel to the rigid suspensions and are reflected to and fro in each span.

The problem which then arose was how to do away with these rigid points and at the same time not jeopardise the safety of the line. We believe that Mr. P. J. Pringle, late of the Burton-on-Trent Corporation Tramways, was one of the first to suspend the trolley wires of his tramway in a scientific fashion. The experiments he made showed the basic idea was right, but, as might be expected, a great many practical points remained to be solved.

Messrs. Geo. W. Green and Co., who were engaged with him on the problem, not only fully realised the difficulties to be overcome, but also recognised that the principle involved was correct, and have devoted the last eight or nine years to the removal of these difficulties. One of the principle troubles was, as some of those who may have tried the system in the early days may remember, the keeping of the ears on the wire. This was due very largely to an exaggerated notion of the value of completely non-fouling ears, which was at that time prevalent, and by a reasonable compromise, embodied in the various ears, the difficulty has been entirely overcome.

Another trouble, inevitable under the circumstances, was the adaptation of the system to the varied conditions which obtain on all tramways, but in the course of years all these difficulties have been gradually eliminated, and to-day standard types of fittings are available for any given condition of service.

SPAN - WIRE CONSTRUCTION.

In spite of the troubles inherent in the system at its commencement, it is surprising that tramway managers have been so reluctant to recognise the indisputable advantages of the system, but in cases where a more enlightened policy has prevailed and the system has been thoroughly tried, the benefits have been palpable to everyone who knows anything of tramway work. One of the first improvements which is visible immediately it is put into use is the total elimination of the vibration which has been referred to at the commencement of this article, and the consequent stoppage of breaking trolley wires. Another advantage also immediately visible is the enormous increase in flexibility over even a span-wire system.

In addition to these solid advantages there is another which is equally important but which only the passage of time makes visible, and that is the remarkably small amount of wear on wires suspended on this system. In one case, which may be quoted here, the diameter of the wire after eight years' continual service was only reduced from ·364 to ·350, and this at a place where the reduction of diameter would naturally be greatest—namely, at the approach to a dip to a railway bridge. In a great majority of cases the reduction of diameter was considerably less—namely, from ·364 to ·359.

It is often said that there is little or no benefit to be obtained from the use of the system on bends and curves, but a glance at the illustrations accompanying this article will show what very little foundation there is for the assertion, and to see the suspensions in actual operation would remove any doubts that could possibly linger as to its efficacy.

On the vital and all-important question of expense, although competing with a system which has been reduced to the finest possible limit so far as cost is concerned, the system compares most favourably with any now extant.

Reprinted from "The Electric Railway & Tramway Journal," Nov. 6th, 1914.