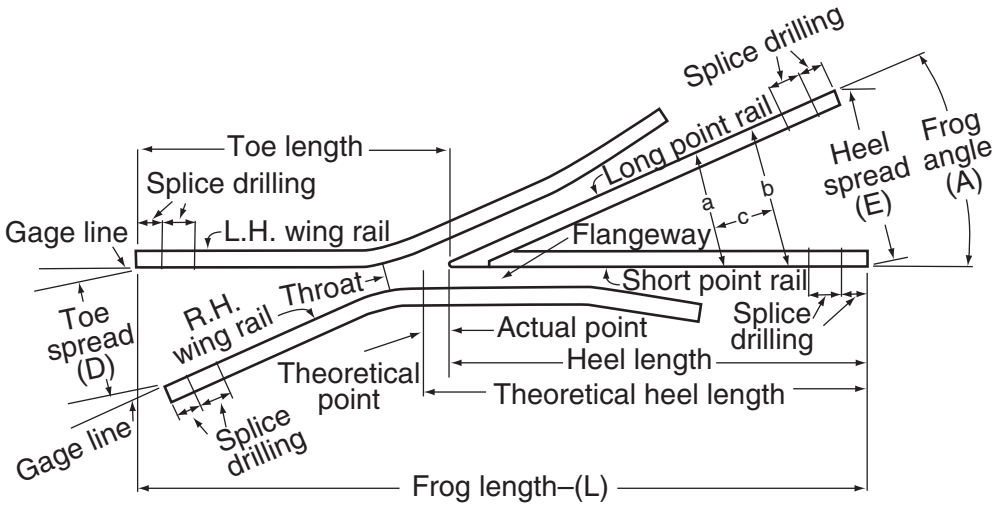
FROGS

Determining Frog Number: Frogs are identified by numbers that correspond to specific angles known as frog angles. The frog number represents the ratio between its length and width, indicating how many inches in length are required to spread one inch in width. For instance, a No. 3 frog spreads 1 inch over 3 inches in length, a No. 6 spreads 1 inch over 6 inches, a No. 9 spreads 1 inch over 9 inches, and so forth. Using trigonometric tables, the frog angle (A) can be calculated if the frog number (N) is given. The formulas linking A and N are: N = 1/2 cot (1/2 A) and cot (1/2 A) = 2N.



To ensure proper track performance, the frog angle must be appropriate for the curve radius. Several rules and straightforward formulas, which do not require trigonometry, can be used to avoid guesswork when choosing the right frogs for different curves. The formulas below offer good approximations.

$$N = \sqrt{\frac{6R}{G}} \qquad R = \frac{GN^2}{6}$$

Here N is the frog number, R is the radius of the curve in feet, and G the gage in inches. The first of these enables the frog number to be found when the radius and track gage are known; the second gives the radius of curve corresponding to a certain frog number and track gage.

For example: What number frog should be used for a curve of 36 feet radius and a track gage of 36 inches?

$$N = \sqrt{\frac{6 \times 36}{36}} = 2.5 \text{ (approx.)}$$ Therefore, a No. 2-1/2 frog would be used.

What radius curve is proper with a No. 3 frog if the track gage is 42 inches?

$$R = \frac{42 \times 3^2}{6} = 63 \text{ feet}$$

The approximate frog number of any straight frog may be found by measuring the total length of the frog and dividing it by the sum of the spreads between gage lines at each end of the frog. Expressed as a formula,

$$N = \frac{L}{D + E}$$

where L, D and E are the measurements shown in the drawing above. These measurements should be made in the same units - either all in inches, or all in feet.

A Fast Method. The following method is also used to find the number of any frog. Measure across the frog at a place (a) where the distance between the gage lines is an even number of inches; measure again where the distance (b) is an inch greater than at (a); the number of inches (c) between the two measured sections (a and b) is the number of the frog. See drawing above.