

Putting in the hole



Anyone thinking for the first time about tubing is immediately interested to know how the hole got there. Was an accurate hole taken and wrapped up in steel, or was a very strong hole pushed firmly through a steel bar? Actually, both ways are used, for different applications. For some of the "lower orders" of the cycling world (junior cycles, tradesmen's bikes, roadsters), a strip of steel is, in fact, wrapped by a series of shaped rollers "round a hole" and the seam electrically welded.

For lightweight machines, whether for touring or racing, a "cold drawn seamless" tube is required—one which starts life as a solid ingot which is pierced hot, either in a hydraulic press, or by running it between inclined rollers which force it over a pointed mandrel, thus "pushing the hole through the bar". Further hot-rolling results in a "hollow" or "bloom", already looking like a tube, which goes to the seamless tube manufacturer to be cold drawn down to the diameter and gauge required for our cycle frames.

Here, each bloom is annealed (i.e. softened by heating), and pickled in acid to remove scale. Then one end is reduced to a smaller diameter, known as the "tag", to enable it to pass through the drawing die. After lubricating with a special compound of oil, soft soap, and other ingredients, it is ready for drawing. Drawbenches come in a variety of sizes, some being mighty monsters over a hundred feet long, with the die-plate nearly halfway along.

The bloom is slipped over a shaped plug on a long mandrel bar, fixed to the end of the drawbench, the tag is pushed through the die and gripped relentlessly by serrated steel jaws, known in the tube trade as "dogs". These are mounted on a "wagon", running on a track containing a large continuous multiple roller chain, to which the wagon is automatically locked when the dogs have gripped the tag,

thus drawing the tube through the die, and over the plug on the end of its mandrel. As this has moved to a position within the die, the metal is in effect squeezed between the die and the plug, thus reducing both diameter and thickness, and at the same time increasing the length. Several such "passes", interspersed with annealing and pickling operations, are necessary before the tube is the right diameter and gauge, accurate to within three thousandths of an inch, for the manufacture of frame tubes, forks and stays for your new bicycle.

