

the strength proportioned to the head of water, rivetted with a double row on the straight seams and single on the round. According to Mr. Hobson, General Manager, Cariboo Hydraulic Company, iron is preferable to steel, because the latter is often of uneven temper, having hard spots which break in bending; besides which steel is more readily attacked and eroded with rust than even the common quality of sheet iron. The best quality of sheet iron has had, in hydraulic pipes, four times the length of life of the best quality of steel.

The sections are made up in lengths of fifteen to eighteen feet, such as can be conveniently handled by two to four men as the pipes may vary from fifteen to thirty inches in diameter; and are put together on the ground "stove-pipe fashion," caulked by sacking and driven home by a wooden ram, eight inches diameter by six feet long."

Though not frequently exposed to the pressure due to the hydrostatic head, these pipes are strong enough to resist this when necessary. Mr. Hobson states that "such iron pipe has been in use for years under a tensile strain of 13,000 pounds to the square inch, although," he adds, "most authorities would hardly admit this factor of safety." He gives the safe pressure for the three sizes of pipes used by his company as follows:

Gauge. B.G.	30 in. Diameter.	22 in. Diameter.	18 in. Diameter.	15 in. Diameter.
No. 14 Steel or Iron.....	150 ft. head	210 ft. head	252 ft. head	305 ft. head
No. 12 " "	230 " "	310 " "	385 " "	460 " "
No. 10 " "	300 " "	420 " "	505 " "	600 " "

These pipes, which are bell-mouthed, should be as large in diameter as can be afforded, to lessen the friction and increase the force of the issuing stream, and because their size must be decreased in approaching the giant so that here they can be easily handled by man power, in the frequent changes of position necessary.

Sheet iron pipes treated by immersion in a hot bath of asphalt have been in use in California, some for more than a quarter of a century, and are subjected to great pressures as shown in the following table, published by the Joshua Hendy Machine Company, San Francisco:—