

less than $\frac{1}{10}$ of a working horse power to make a barrel of flour in $\frac{24}{n}$ hours.

In regard to the capacity required in the canal or head race, to deliver at the mill, say 14000 cubic ft. of water per minute, without undue loss of head, & thereby loss of power, the canal being 33 chs. equal to $132\frac{1}{2}$ rods long. I think that the bed of the canal should be 10 ft. below the surface of the water in the pond above the dam, from whence the water is drawn, & that the bed of the canal should be 20 ft. wide, & the side slopes of the canal on either side $1\frac{1}{2}$ ft. horizontal to 1 ft. perpendicular. This will give 7 ft. in depth of water in the canal below the ice, allowing the ice to be 3 ft. thick in the coldest weather. See diagram of vertical section across head race as shown below. If the surface of the water in the pond, during the cold weather, should be maintained, by means of flash boards on the dam, to a height equal to $1\frac{1}{2}$ ft. above what it was Feb. 12 to 14, when the levels were taken, then the bed of the canal then it would be only $8\frac{1}{2}$ ft. below the level of the surface of the water in the pond as on those days, or 10 ft. below the surface of the water in the pond, when raised by means of flash boards to a height of $1\frac{1}{2}$ ft. above what it was on said days, the idea being to have in the canal at least 7 ft. in depth of water under the thickest ice, & 10 ft. in depth of water when the canal is free from ice. To excavate the canal, so that its bed shall be 20 ft. wide & 10 ft. below the surface of the water in the pond as on Feb. 12 to 14, & the side slopes of the canal on either side, being $1\frac{1}{2}$ ft. horizontal to 1 ft. perpendicular, will require the removal of 65120 cubic yards of earth. measured in excavation, & to excavate the canal so that its bed shall be 20 ft. wide & $8\frac{1}{2}$ ft. below the surface of the water in the pond on those days, the side slopes of the canal on either side being $1\frac{1}{2}$ ft. horizontal, to 1 ft. perpendicular, will require the removal of 57399 cubic yards of earth.

But I would advise that the bed of the canal be 10 ft. below the surface of the water in the pond