

It is improbable that a concern would go on putting in each time it renews its plant an uneconomical plant, and it is highly probable that the low grade engine will be improved in efficiency.

As the damages are figured forever, it will add very little to the damages for the short time which the uneconomical plant will be obliged to run.

Privileges with no Auxiliary Plant.

The basis on which the damages should be estimated in these cases, where there is no auxiliary plant, is the same

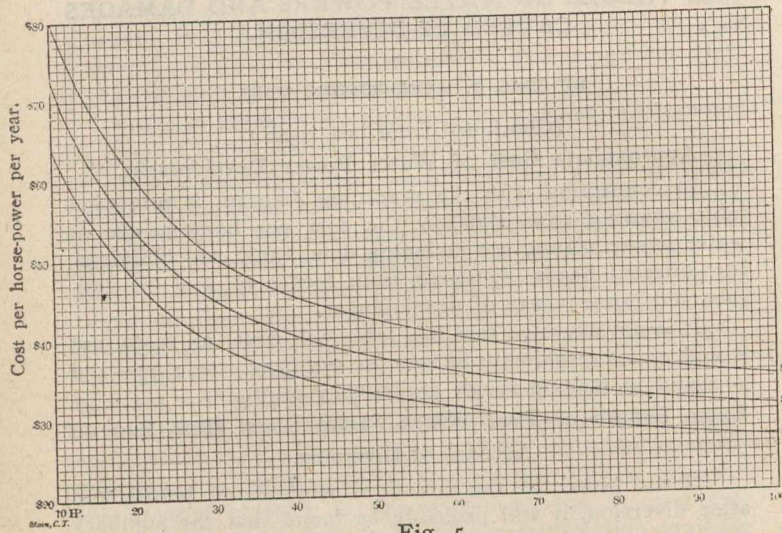


Fig. 5.

Diagram showing the estimated cost of producing one horse-power, per year of 3,080 hours, in simple condensing engines of capacity given, with coal at \$3, \$4 and \$5 per long ton.

as for any other. The mere chance that an owner can manage in some way to run his business in accordance with the fluctuating flow of the stream, does not entitle him to any greater damage than his neighbor, who is fitted up to run continuously. A small amount of power diverted will not in most cases make the conditions sufficiently bad to require the addition of a supplementary plant for that reason alone. An allowance, however, should be made in estimating the

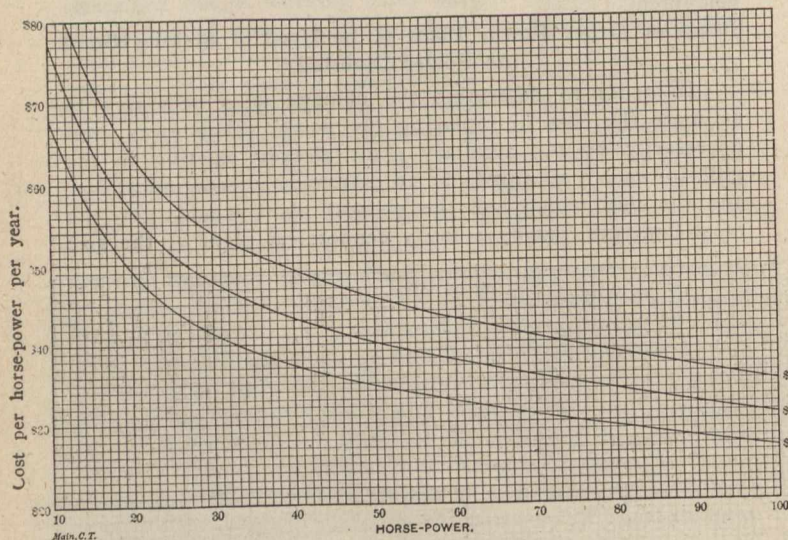


Fig. 6.

Diagram showing the estimated cost of producing one horse-power per year of 3,080 hours in simple non-condensing stationary engines of the capacity given, with coal at \$3, \$4 and \$5 per long ton.

damages in such cases for such portion of a steam plant as would ordinarily be installed to produce a uniform power as is equal to the power diverted in the dry month and the running expenses should be estimated on a plant of full size and not on a very small plant.

The proper method of ascertaining the damages to a plant of this sort is to find the difference in value before and after diversion, and this is obtained by finding the cost of producing a uniform power before and after diversion.

Table of Estimated Costs Per Horse-Power of Water Power Plants

Having Horizontal Turbines, Steel Penstocks, and Walled Tail-Races—Dam and Buildings not Included.

| | Feet. "L." | 10-ft. fall. | 15-ft. fall. | 20-ft. fall. | 30-ft. fall. | 40-ft. fall. |
|------------|---------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| 1,000-H.P. | 100 | \$65.14 | \$40.92 | \$29.37 | \$19.40 | \$14.59 |
| | 200 | 71.91 | 45.48 | 32.84 | 21.70 | 16.38 |
| | 300 | 78.66 | 50.05 | 36.30 | 24.01 | 18.17 |
| | 400 | 85.43 | 54.62 | 39.77 | 26.32 | 19.95 |
| | 500 | 92.20 | 59.18 | 43.23 | 28.63 | 21.74 |
| | 600 | 98.96 | 63.75 | 46.69 | 30.94 | 23.53 |
| 900-H.P. | 100 | 65.35 | 41.00 | 29.56 | 19.56 | 14.79 |
| | 200 | 72.08 | 45.58 | 33.04 | 21.85 | 16.60 |
| | 300 | 78.80 | 50.16 | 36.53 | 24.14 | 18.41 |
| | 400 | 85.50 | 54.74 | 40.01 | 26.41 | 20.22 |
| | 500 | 92.24 | 59.32 | 43.49 | 28.70 | 22.02 |
| | 600 | 98.96 | 63.91 | 46.97 | 30.99 | 23.84 |
| 800-H.P. | 100 | 65.48 | 41.10 | 29.65 | 19.68 | 14.99 |
| | 200 | 72.22 | 45.68 | 33.12 | 21.98 | 16.78 |
| | 300 | 78.95 | 50.26 | 36.68 | 24.28 | 18.57 |
| | 400 | 85.70 | 54.84 | 40.04 | 26.56 | 20.35 |
| | 500 | 92.43 | 59.41 | 43.52 | 28.87 | 22.14 |
| | 600 | 99.15 | 64.00 | 46.98 | 31.17 | 23.93 |
| 700-H.P. | 100 | 65.72 | 41.19 | 29.87 | 19.90 | 15.12 |
| | 200 | 72.48 | 45.75 | 33.35 | 22.19 | 16.93 |
| | 300 | 79.23 | 50.30 | 36.82 | 24.49 | 18.73 |
| | 400 | 86.00 | 54.86 | 40.29 | 26.77 | 20.54 |
| | 500 | 92.74 | 59.42 | 43.77 | 29.07 | 22.34 |
| | 600 | 99.50 | 63.97 | 47.25 | 31.37 | 24.16 |
| 600-H.P. | 100 | 65.86 | 41.56 | 30.00 | 20.02 | 15.37 |
| | 200 | 72.64 | 46.14 | 33.49 | 22.34 | 17.20 |
| | 300 | 79.42 | 50.72 | 36.97 | 24.64 | 19.04 |
| | 400 | 86.20 | 55.30 | 40.45 | 26.95 | 20.87 |
| | 500 | 92.98 | 59.88 | 43.94 | 29.27 | 22.70 |
| | 600 | 99.76 | 64.47 | 47.42 | 31.57 | 24.54 |
| 500-H.P. | 100 | 66.00 | 41.70 | 30.24 | 20.24 | 15.52 |
| | 200 | 72.82 | 46.32 | 33.78 | 22.56 | 17.31 |
| | 300 | 79.64 | 50.94 | 37.28 | 24.86 | 19.10 |
| | 400 | 86.46 | 55.56 | 40.80 | 27.16 | 20.88 |
| | 500 | 93.28 | 60.16 | 44.34 | 29.48 | 22.66 |
| | 600 | 100.10 | 64.80 | 47.84 | 31.80 | 24.44 |
| 400-H.P. | 100 | 66.28 | 42.03 | 30.55 | 20.79 | 16.00 |
| | 200 | 73.16 | 46.65 | 34.05 | 23.10 | 17.82 |
| | 300 | 80.03 | 51.26 | 37.53 | 25.40 | 19.64 |
| | 400 | 86.90 | 55.88 | 41.03 | 27.73 | 21.45 |
| | 500 | 93.78 | 60.50 | 44.53 | 30.03 | 23.27 |
| | 600 | 100.65 | 65.13 | 48.03 | 32.35 | 25.08 |
| 300-H.P. | 100 | 66.87 | 42.67 | 31.09 | 21.49 | 16.50 |
| | 200 | 73.70 | 47.30 | 34.57 | 23.83 | 18.33 |
| | 300 | 80.54 | 51.94 | 38.07 | 26.18 | 20.16 |
| | 400 | 87.33 | 56.54 | 41.54 | 28.53 | 22.00 |
| | 500 | 94.17 | 61.18 | 45.04 | 30.88 | 23.83 |
| | 600 | 101.00 | 65.78 | 48.51 | 33.22 | 25.67 |
| 200-H.P. | 100 | 68.50 | 44.22 | 32.45 | 22.61 | 17.60 |
| | 200 | 75.35 | 48.84 | 35.97 | 24.97 | 19.47 |
| | 300 | 82.25 | 53.45 | 40.04 | 27.33 | 21.34 |
| | 400 | 89.10 | 58.10 | 43.56 | 29.70 | 23.21 |
| | 500 | 96.00 | 62.70 | 47.08 | 32.06 | 25.08 |
| | 600 | 102.85 | 67.35 | 50.60 | 34.43 | 26.95 |
| 100-H.P. | 100 | 71.39 | 46.64 | 34.76 | 24.75 | 19.80 |
| | 200 | 78.43 | 51.37 | 38.39 | 27.17 | 22.00 |
| | 300 | 85.47 | 56.10 | 42.02 | 29.59 | 24.20 |
| | 400 | 92.51 | 60.83 | 45.65 | 32.01 | 26.40 |
| | 500 | 99.55 | 65.56 | 49.28 | 34.43 | 28.60 |
| | 600 | 106.60 | 70.28 | 52.91 | 36.85 | 30.80 |

Note: "L"—Distance from feeder head to end of tail-race. Cost of canal, if any, not included.

Allowance for Permanent Power Diverted.

If any power is diverted which can be depended upon all the time, an allowance should be made for this. If the