channel intended to be used give ultimate results quite as correct as the best and more complex methods given in works on this special subject.

The attached table is founded on Eytelwein's formula; it gives the length of pipe in which 1 ft. of head is absorbed by friction in clean pipes from 6 in. to 36 in. in diameter when carrying from one to fifteen sluice-heads of water.

Examples.

What is the loss of head in 2,000 ft. of clean 15 in. pipes when carrying eight sluice-heads of water?

The length of pipe given in the table in which 1 ft. of head is absorbed in 15 in. pipes carrying eight sluice-heads of water being 77 ft.—

$$\frac{2000}{77} = 25{\cdot}97 \text{ ft. loss of head.}$$

If the pipes are slightly rough add 30 per cent.—

$$\begin{array}{rr} & 25{\cdot}97 \\ + 25{\cdot}97 \times 0{\cdot}3 = & 7{\cdot}79 \\ \hline & 33{\cdot}76 \text{ ft. loss of head.} \end{array}$$

If pipes are very rough, and badly laid, add 60 per cent.—

$$\begin{array}{rr} & 25{\cdot}97 \\ + 25{\cdot}97 \times 0{\cdot}6 = & 15{\cdot}58 \\ \hline & 41{\cdot}55 \text{ ft. loss of head.} \end{array}$$

What is the loss of head in 1,740 ft. of clean 15 in. pipes when carrying nine sluice-heads of water?

$$\frac{1740}{61} = 28{\cdot}52 \text{ ft. loss of head.}$$

What is the loss of head in 1,580 ft. of rough and badly-laid 11 in. pipes when carrying nine sluice-heads of water?

$$\frac{1580}{13} = 121{\cdot}53 + (121{\cdot}53 \times {\cdot}6) = 194{\cdot}44 \text{ ft. loss of head.}$$

If the quantity of water intended to be used is more than fifteen sluice-heads, take from the table the number corresponding to one-half, one-third, or one-fourth the intended quantity, and divide by 4, 9, or 16 respectively.

The loss of head in a 20 in. pipe, carrying ten sluice-heads of water, is 1 ft. of head in every 209 ft. length of pipe (as per table).

The loss of head in a 20 in. pipe, carrying twenty sluice-heads of water, is 1 ft. of head in every $\frac{209}{4} = 52{\cdot}25$ ft. length of pipe.

The loss of head in a 20 in. pipe, carrying fifteen sluice-heads of water, is 1 ft. of head in every 93 ft. length of pipe (as per table).

The loss of head in a 20 in. pipe, carrying forty-five sluice-heads of water, is 1 ft. of head in every $\frac{93}{9} = 10{\cdot}33$ ft. length of pipe.

The loss of head in a 20 in. pipe, carrying sixty sluice-heads of water, is 1 ft. of head in every $\frac{93}{16} = 5{\cdot}81$ ft. length of pipe.

Length of Pipe (in Feet) in which 1 ft. of Head is absorbed by Friction in Pipes from 6 in. to 36 in. in Diameter when Carrying from One to Fifteen Sluice-heads of Water.

(Calculated from $\frac{R\ 10560}{V^2}$ = length for 1 ft. of head.)

Diameter in Inches.	One Head.	Two Heads.	Three Heads.	Four Heads.	Five Heads.	Six Heads.	Seven Heads.	Eight Heads.	Nine Heads.	Ten Heads.	Eleven Heads.	Twelve Heads.	Thirteen Heads.	Fourteen Heads.	Fifteen Heads.
6	51	12·7	5·6	3·1	2	..	..	..	..	..	..	..	..	..	..
7	110	27·5	12·2	6·9	4·4	3	2·2	..	..	..	..	..	..	..	..
8	214	53·5	23·7	13·4	8·5	5·9	4·3	3·3	2·6	2·1	..	..	..	..	..
9	386	96·5	42·9	24·1	15·4	10·7	7·8	6	4·7	3·8	3·2	2·6	2·2	..	..
10	654	163	72	40·7	26	18	13	10·1	8	6·5	5·4	4·5	3·8	3·3	2·9
11	1,054	263	117	65	42	29	21	16	13	10·5	8·7	7·3	6·2	5·3	4·6
12	1,628	407	180	101	65	45	33	25	20	16	13	11	9·6	8·3	7·2
13	2,430	607	270	151	97	67	49	37	30	24	20	16	14	12	10.8
14	3,519	879	391	219	140	97	71	54	43	35	29	24	20	17	15
15	4,969	1,242	552	310	198	138	101	77	61	49	41	34	29	25	22
16	6,862	1,715	762	428	274	190	140	107	84	68	56	47	40	35	30
17	9,292	2,323	1,032	580	371	258	189	145	114	92	76	64	55	47	41
18	12,366	3,091	1,374	773	495	344	252	193	152	123	102	86	73	63	55
20	20,943	5,235	2,327	1,308	837	581	427	327	258	209	173	145	124	106	93
22	33,729	8,432	3,747	2,108	1,349	936	688	527	416	337	279	234	199	172	149
24	52,112	13,028	5,790	3,257	2,084	1,447	1,063	814	643	521	430	361	308	265	231
26	77,760	19,440	8,640	4,860	3,110	2,160	1,587	1,215	960	777	642	540	460	396	345
28	112,630	28,157	12,514	7,039	4,505	3,128	2,298	1,759	1,390	1,126	930	782	666	574	500
30	159,040	39,760	17,671	9,940	6,362	4,418	3,246	2,485	1,963	1,590	1,314	1,104	941	811	707
32	219,620	54,905	24,402	13,726	8,785	6,100	4,482	3,431	2,711	2,196	1,815	1,525	1,299	1,120	976
34	297,370	74,342	33,041	18,585	11,895	8,260	6,068	4,646	3,671	2,973	2,457	2,065	1,759	1,517	1,321
36	395,730	98,932	43,970	24,733	15,829	10,992	8,076	6,183	4,886	3,957	3,270	2,748	2,341	2,019	1,758