$$\log \frac{P}{P_1} = 1.351 \log \frac{V_1}{V}$$

$$.7407 \log \frac{P}{P_1} = \log \frac{V_1}{V}$$

$$\text{antilog } .7407 \log \frac{P}{P_1} = \frac{V_1}{V} = L$$

$$\text{and } V = \frac{V_1}{L} = \frac{13.65}{L} \text{ cu. ft.}$$

There being no means at hand by which to take indicator diagrams, figures for the work done were obtained as follows:

The net work of compression and delivery

$$= \frac{PV - P_1V_1}{.35} + PV - P_1V_1 = 3.857\ PV - 3.857 P_1V_1$$

$= W$ ft. lbs. per pound of air,

V, V_1 being in cu. ft. and P, P_1 in pounds per sq. ft.

RESULTS.

P Lbs. per sq. ft. absolute.	$\log \frac{P}{P_1}$	$.7407 \log \frac{P}{P_1}$	$\frac{V_1}{V}$	V cu. ft.	W ft. lbs.
2116	—	—	—	—	—
3556	.2254	.1670	1.469	9.293	16000
4996	.3731	.2764	1.890	7.223	27800
6436	.4831	.3578	2.279	5.989	37200
7876	.5708	.4228	2.647	5.156	45200
9316	.6437	.4768	2.998	4.554	52100
10756	.7061	.5231	3.335	4.093	58400
12196	.7607	.5635	3.660	3.729	64000
13636	.8092	.5994	3.976	3.434	69100
15076	.8528	.6317	4.283	3.187	73900

This assumes that air at end of suction stroke was still at the temperature of the room, 543.5° F. absolute, and neglects clearance and leakage. These latter two would tend to decrease net work done; on the other hand the pressure would require to fall slightly below atmosphere before admission could take place and rise slightly above the gauge pressure at end of compression, in order to manipulate the valves, which would tend to increase the net work; so these factors would counterbalance to a great extent.