Required a spring to have at fitted load of 45 LBS.

$$\alpha = \frac{64.45 \cdot (.4)^3 \, 9}{12{,}500{,}000 \quad (.128)^4}$$

$$\frac{1775}{12{,}500{,}000 \times .000268} = .53"$$

$1.8 + .53 = 2.33$ "free length"

85 LBS. per inch.

load with valve lifted = 77 LBS.

Must compress to $1\frac{5}{16}$"

Speedometer reading on Tachometer Facing

Car moves $81\frac{1}{2}$" per rev. of road wheel.

With 4.0 to 1 gear

Engine turns @ $\frac{1760 \times 36 \times 4}{81.5}$

= 3110 RPM @ 60 M.P.H

R.P.M	4.0	4.5	5.0	5.5
1000	19.3	17.2	15.4	14.0
1500	29.3	25.7	23.2	21.0
2000	38.6	34.3	30.8	28.0
2500	48.3	42.8	38.6	35.0
3000	57.9	51.4	46.3	42.0
3500	67.5	60.0	54.0	49.0
4000	77.3	68.5	61.7	56.0
4500	86.7	77.1	69.5	63.0
5000	96.5	85.6	77.1	70.0

(20 HP) with 3 to 1 Top 1900 R.P.M @ 60 MPH.

$$P = \frac{F \cdot G \cdot d^5}{8 \cdot D^3 \cdot h}$$

where

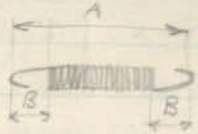
P = load in lbs
F = deflection in ins. (or extension)
G = 12,600,000
d = dia. of wire
D = mean coil dia.
h = solid height (or length) of coils when compressed solid

$$\text{Stress in lbs per } \square'' = \frac{8 \cdot D \cdot P}{3.14 \cdot d^3}$$

Carb. for 7HP Engine (Standard)

Zenith Type 22 F.
22 mm. Outlet
15 mm. Choke Tube
Main jet 70
Comp. jet 75

Brake shoe spring - 7HP Car



Fitted length A = 3½", B = ⅛" O.D. = 11/32"
to give a load of approx 29 LBS. in fitted position

let x = extension

then $29 = \frac{x \times 12{,}600{,}000 \times (.064)^5}{8 \times (.280)^3 \times (2.5 - x)}$

$$29 = \frac{x \times 63 \times .000001}{8 \times .022 \times (2.5 - x)}$$

$$= \frac{6.3x}{.22 - .088x} \quad 8.85x = 6.38$$

extension = .72"

Above is worked out for 16 Swg.

S = 78,000 lbs. per □"

$$\frac{x \times 12{,}600{,}000 \times (.056)^5}{8 \times (.268)^3 \times (2.5 - x)}$$

$$\frac{x \times 12{,}600{,}000 \times .000000552}{8 \times .0239 \times (2.5 - x)}$$

$.191$

$$= \frac{7.0\,x''}{.478 - .191x} = 29$$

$12.54x = 13.9$.

extension = 1.1" to give 29 lbs.

Above using 17 S.W.G. wire
S = 121,000

12 HP Head standard.

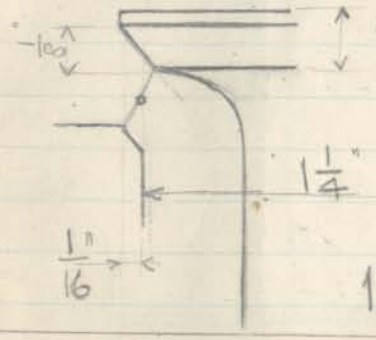
Head capacity = 80 cc.
joint washer = 26 cc
total = 106

Cyl capacity (72"/h x 4") = 413.66.

$$\frac{413.66 + 106}{106} = 4.9$$

Cyl. head for 2 litre engine

Cyl capacity ($3\frac{1}{8}$" x 4") = 502.5 cc.
To give a compression ratio of 5:1. Total cyl. head capacity = 122 cc



5/16 LIFT

Ring area = 1□" approx.

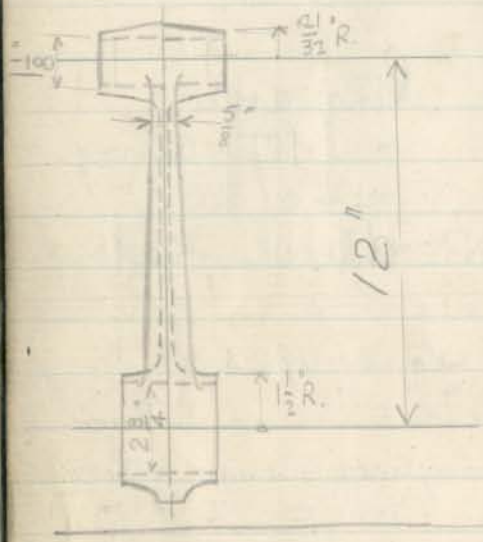
12 HP Valve etc.

7 HP. Performances &c. 1923
1st Monza track @ 59 m.p.h.
1st. Brooklands (Gordon England) 5¾ m. @ 67 m.p.h.
same meeting 1 record & 1 third

1st week Sept.
Brooklands G. Englands racer
Puts up new records in 750 cc. class
5 miles @ 80 m.p.h.

Engine $4\frac{3}{8}$" x 6" x 4. ∞ 2

Gudgeon pin $\frac{13}{16}$" O.D x $2\frac{1}{8}$" (drilled $\frac{3}{8}$" dia)
Little end bearing $2\frac{1}{4}$" long.
Big end bolts $\frac{7}{16}$" dia.
Crankshaft gear $1\frac{1}{4}$" wide.



Speeds of 3½ HP Ricardo-Triumph

Engine R.P.M	Gears 4·5	7·47	12·46
1000	18·2	11	6·6
1500	27·3	16·5	9·9
2000	36·4	22	13·2
2500	45·5	27·5	16·5
3000	54·6	33	19·8
3500	63·7	38·5	23·1
4000	72·8	44	26·4
4500	81·9	49·5	29·7

Wheel 26" x 3" (700 x 80)
Transmission $\frac{5}{8}$" x $\frac{1}{4}$" chain (front oil-bath)
$\frac{5}{8}$" x $\frac{3}{8}$" chain rear.
Single cylinder 80.94 x .97 = 499 cc.
4 valves per cyl. 2 inlet 2 exhaust.
Detachable head. Ricardo slipper piston.

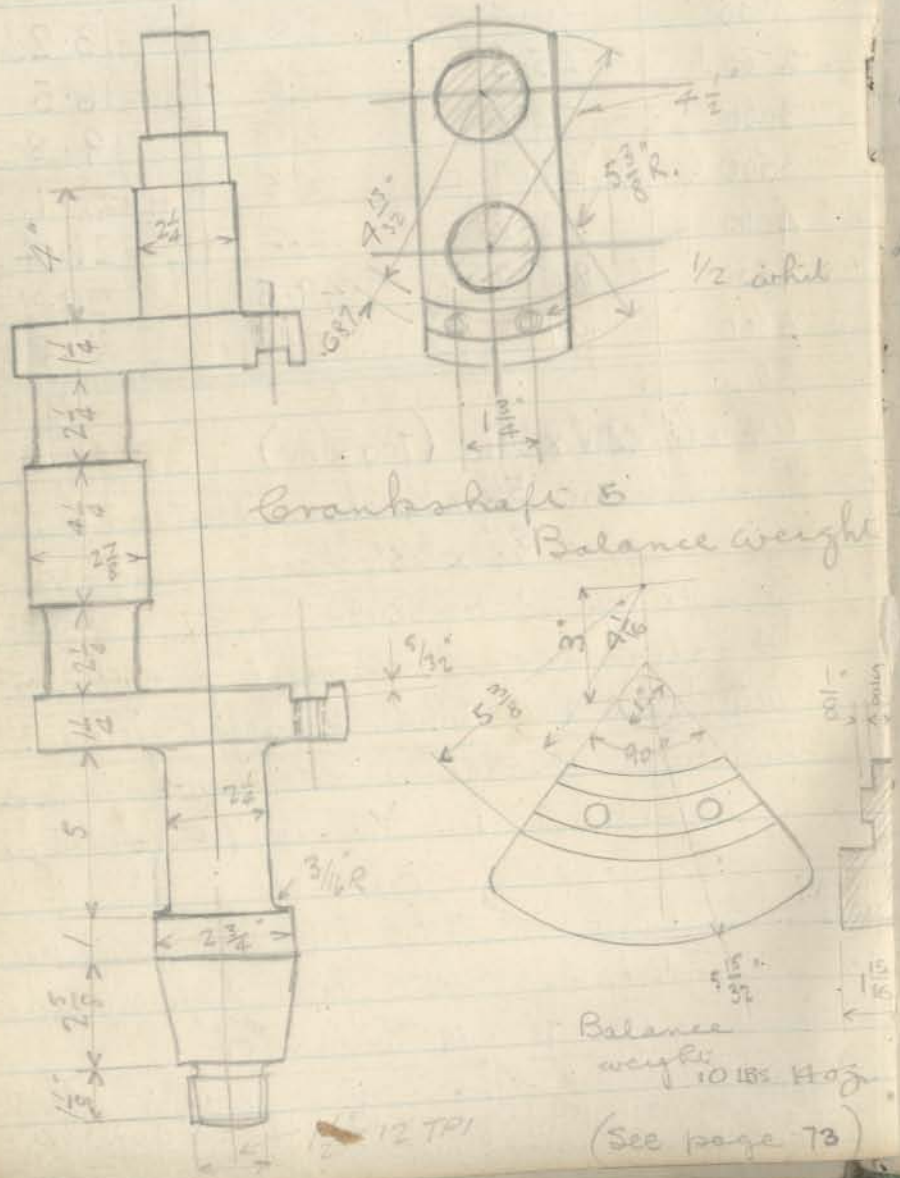
Standard model speed between 60 & 65.
climb 1 in 9 on top (indefinitely?)

HP = 12 HP @ 4000 R.P.M low compression
13½ HP @ 4000 R.P.M high compression
MEP 78 & 88 lbs. per □" (?)

These notes apply only to ordinary standard engines.

Engine 4 3/8" × 6" × 2

Coupled to Electric Power Co. Ltd. dynamo :- 6 1/2 KW. @ 850 RPM. 100 - 150 Volt. 45 Amp.



(See page 73)

Close gearbox ratios for ¼ HP Racers.

1) 1st. motion shaft wheel – 16 (STD 17T. P.C)
2) Layshaft wheel – 25

$\frac{17}{8}$ = 2·125" = P.C.D

1) O.D. = 2·125" + ·2" = $\frac{2·325"}{2·325}$

2) $\frac{25}{8}$ = 3·125" = P.C.D

O.D. = 3·125" + ·2" = $\frac{3·325"}{3·325}$

2nd Speed reduction = $\frac{25}{16} \times \frac{14}{24}$ = 1·15"

(using XA 904/5 Special 2nd spd. wheels = 5 to 1 second. with. 45 top.)

1st Speed. reduction = $\frac{25}{16} \times \frac{26}{16}$ = 2·54

1st. Speed = 11·4 to 1

2nd spd. using standard 2nd. speed wheels = $\frac{25}{16} \times \frac{22}{20}$ = 1·72 = 7·75