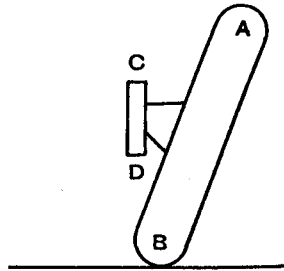


Teaching of Mechanics", quoted on p. 178 of *Gazette* No. 309, was a perfectly fair one: I do not believe, however, that the explanation given is correct.

Whether the turning of the front wheels raises or lowers the c.g. of the car depends not on the inclination of the wheels to the ground, but on the inclination of the pivot-axles, about which the wheels are turned when steering. The most important principle to bear in mind when designing the front wheels of a car is that the pivot-axle should meet the ground in the same point as the tyre (looked at from the front). So, as in Fig. 1, the wheel AB is made to lean out and the pivot-axle CD is vertical. The reason for this is so that there should not be an excessive torque tending to wrench the wheel off. The reaction of the ground at B is vertical, and so we require the axle to be vertically above B .



In order to obtain a certain amount of "castering" effect (automatic straightening-out after a turn), another method is used. The pivot-axle is sloped forward (from 6° to 10°) so that it meets the ground in front of the point of contact of the wheel. It can be seen that this arrangement actually makes the c.g. drop when the wheels are turned, but this result is more than counterbalanced by the dynamical effect of the trailing of the point of contact behind the line of the pivot-axle, the frictional resistances at the point of contact giving couples which tend to restore the wheels to the straight.

One other point about the front wheels. The pivot-axle does not in general point exactly to the centre-line of the wheels, but slightly inside it. Consequently when going forward the wheels tend to splay out, and to counteract this they are made to "lead-in", so that the front edges of the wheels are about $\frac{1}{2}$ inch closer together than the rear edges.

Yours, etc., F. G. MAUNSELL.

A PRIORITY REFERENCE.

Mr. C. E. Walsh writes to point out that the result in Note 2223 (*Gazette*, xxxv, p. 189) was proved by him in *Edinburgh Mathematical Notes*, No. 37, (1949), pp. 22-3.

MATHEMATICAL ASSOCIATION

Treasurer's Statement for the Year ending 31st October, 1951

RECEIPTS				PAYMENTS			
1950		1951		1950		1951	
£279 2 3	Balance, November 1st, 1950	...	£115 1 11	£1,490 18 0	Gazettes Nos. 309-312 (September 1950-May 1951):	...	...
1,866 17 1	Subscriptions for 1951:	...	...	131 9 6	Printing	£1,462 0 1	...
19 11 0	Ordinary Members	£2,121 18 0	...	200 0 0	Postage and despatch	224 13 7	...
	Junior Members	20 3 0	2,142 1 0	37 8 9	Editor	200 0 0	...
					Index	37 17 9	£1,924 11 5
52 3 0	Subscriptions for previous years:	...	...	52 1 8	Reports:	...	...
0 11 6	Ordinary Members	261 17 6	261 17 6		Reprinting Mechanics	...	...
	Junior Members	0 0 0			First Geometry	125 15 0	...
					Algebra	109 4 9	...
51 14 0	Subscriptions in advance:	...	...	33 15 6	Printing Trigonometry (completion)	...	267 6 0
6 0 0	Ordinary Members	42 7 0	52 6 6	408 19 0	Calculus (completion)	8 14 6	351 0 11
	Junior Members	9 19 6			Rules of the Association	23 11 9	1 13 0
157 10 0	Life compositions	...	135 1 0	231 10 9	Expenses of Committees	...	41 4 2
377 10 1	Proceeds of sales of Gazettes	...	395 10 11	2 18 8	Expenses of Problems Bureau	...	...
252 8 1	Proceeds of sales of Reports	...	417 13 9	36 10 3	Expenses of Annual Meeting	...	...
17 5 0	Advertisements in Gazettes	...	24 5 0	20 17 0	Grants to Branches:	...	...
39 13 2	Interest on investments	...	40 12 8	2 3 6	London	21 12 0	...
22 10 0	Subletting of office	...	41 5 0	1 14 6	Yorkshire	2 2 0	...
	Sales of Isaac Newton documents	...	21 3 2	2 0 6	Bristol	...	...
0 1 6	Sundries	...	0 1 7	7 17 6	Manchester and District	2 8 0	...
				4 10 0	Cardiff	4 8 6	...
				3 1 6	Midland	4 11 6	...
				1 16 0	North Eastern	3 3 0	...
				1 8 6	Liverpool	2 12 6	...
				2 6 6	Sheffield and District	2 14 0	...
				0 15 0	Southampton and District	3 0 0	...
				4 1 0	South-West Wales	1 4 0	...
				1 7 0	Leicester and County	4 13 0	...
				1 16 0	North Lincs and Westmorland	...	...
				1 1 0	North Staffs and District	2 2 0	...
				0 18 0	Sydney, N.S.W.	1 4 0	...
				1 19 0	Queensland	0 18 0	...
				0 4 6	Victoria	1 10 0	...
					Auckland, N.Z.	...	58 2 6
				158 11 0	Clerical assistance	...	185 0 0
				104 7 7	Stationery and printing	...	58 16 6
				57 18 10	Office rent and expenses	...	101 1 4
				19 3 6	Postage	...	50 9 3
					Festival week	...	27 8 7
				2 4 9	Sundries	...	2 6 7
					Balance November 1st, 1951:	...	...
					Cash in hand	2 6 1	...
					Cash in bank	575 13 8	577 19 9
£3,142 16 8		£3,647 0 0		115 1 11			£3,647 0 0
				£3,142 16 8			

LIABILITIES			
1950		1951	
£57 14 0	Subscriptions in advance	...	£52 6 6

Liabilities also include the amounts received from 238 members who have paid life subscriptions.

ASSETS			
1950		1951	
£115 1 11	Balance in bank and in cash	...	£577 19 9
1,100 0 0	War Loan	...	1,100 0 0
333 1 7	Due from Messrs. G. Bell & Sons, Ltd., for sale of Gazettes and Reports	...	370 9 9

Subscriptions are due from 99 members.
Assets also include Books in the Library, Gazettes, Reports and office furniture, of which no valuation has been made.

November 10, 1951

J. B. MORGAN, *Hon. Treasurer*

December 6, 1951

—Audited and found correct.

K. S. SNELL.