

GYROSCOPIC THEORY

BY

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GYROSCOPIC THEORY

Gyroscopic Theory has been explained in an elementary manner in Perry's *Spinning Tops*, and the mathematical treatment extended in Crabtree's *Spinning Top and Gyroscopic Motion* ; but for the full analytical development the *Theorie des Kreisels* must be studied of Klein and Sommerfeld, where no mathematical difficulty is passed over or ignored.

The dynamical theory begins with Euler, 1748, and is carried on by Segner, Lagrange, Poisson, Poincot, Pinseux, Kelvin, Routh, Klein, and others to recent times.

The present Report is intended to have the same scope as the *Kreisel-Theorie*, and to be consulted for reference of the mathematical formulas required for a practical problem as it arises, where the numerical data can be assigned, and an answer is wanted without delay ; even where Exact Theory is not yet prepared, and an approximate treatment must be made to serve.

These practical problems are important in the discussion of the Stability of the Flying Machine, and the movement of the accessories, such as the gyroscopic influence of the motor and air screw.

In the diagrams on the plates at the end an attempt has been made to give the scale and shape of a figure, without entering into mechanical detail, so as to make them serve as model of a blackboard drawing, in an explanation of facts to be recognised when met with out of doors on a wider area.

Mr. J. L. Nayler, of the Aeronautical Department in the National Physical Laboratory has given valuable help in revising the proof sheets and verifying the results.

PLATES

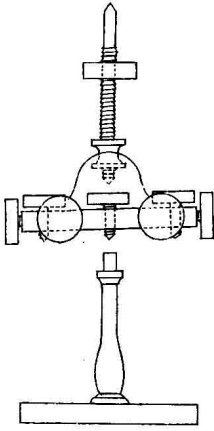


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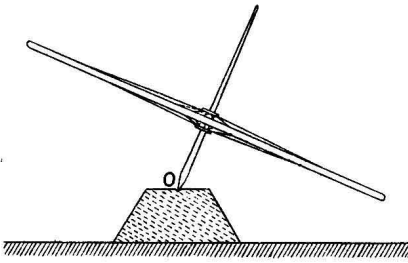


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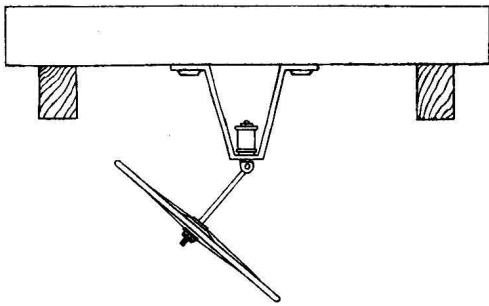


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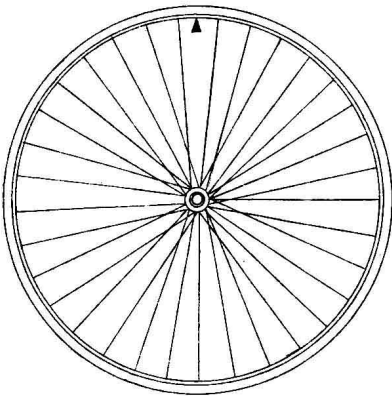


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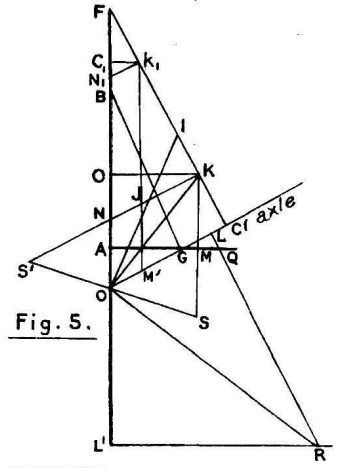
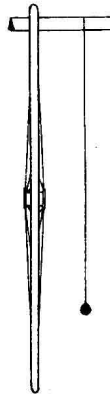


Fig. 5.

ELEVATION.

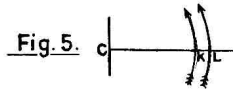
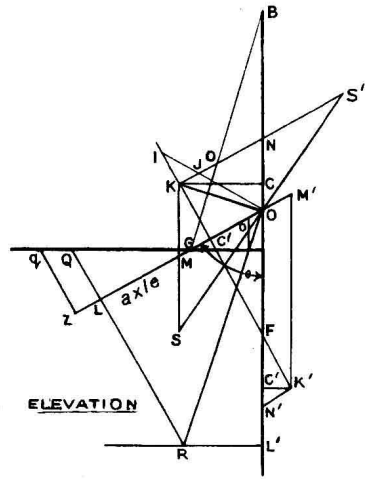
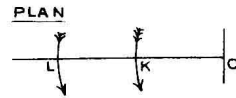


Fig. 5.

PLAN.



ELEVATION



PLAN

Fig. 6.

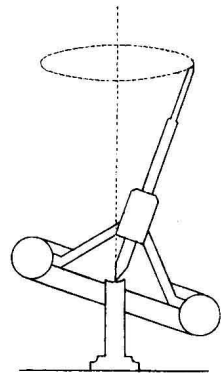


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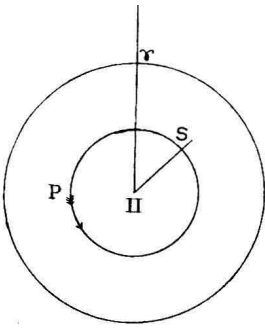


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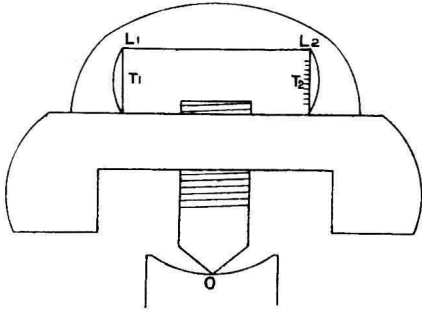


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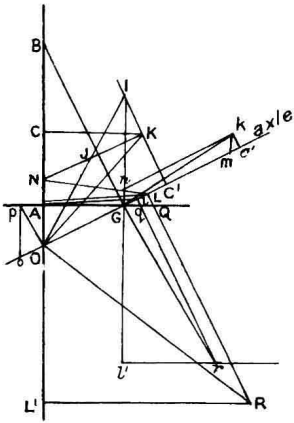


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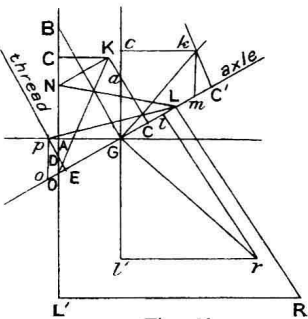


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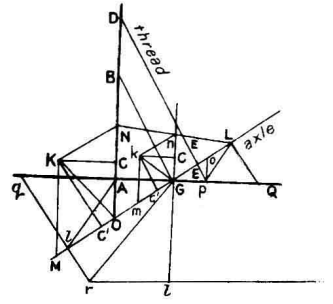


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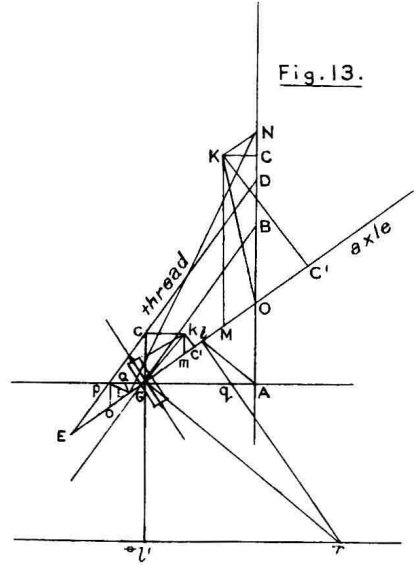


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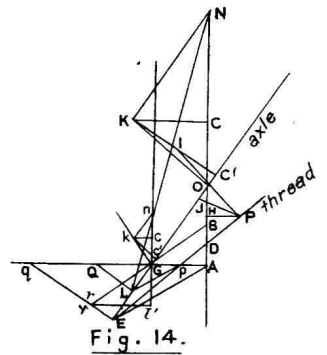


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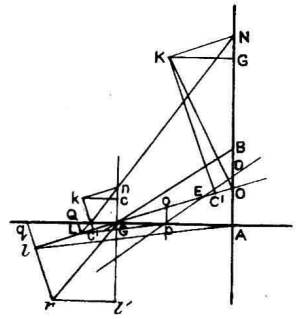
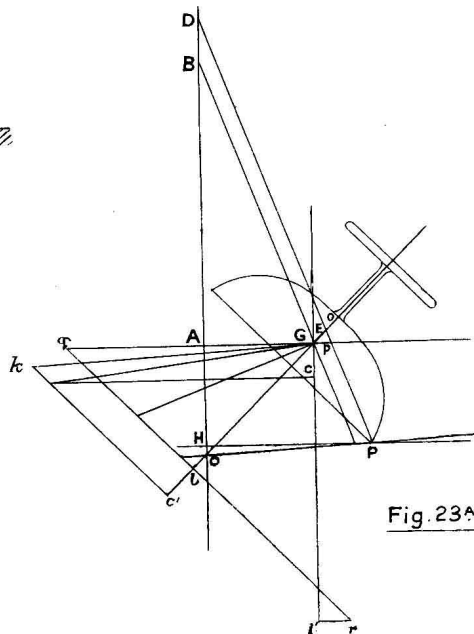
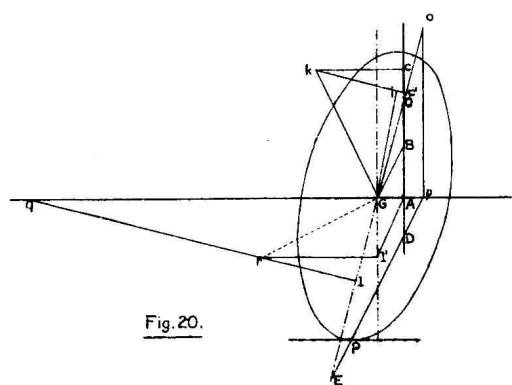
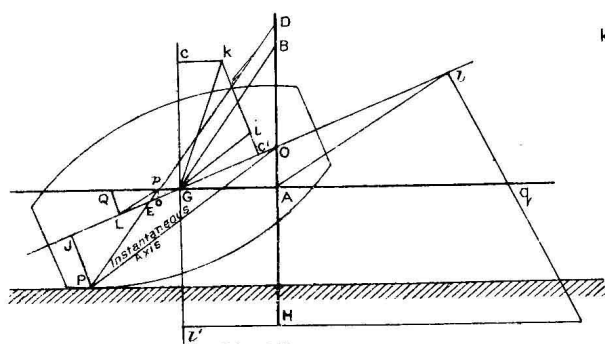
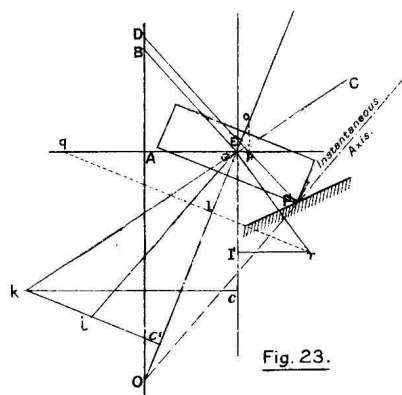
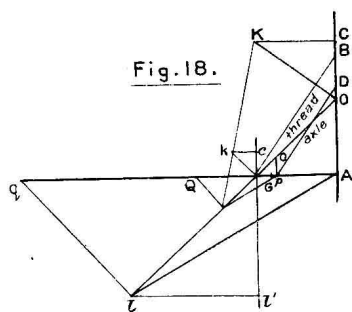
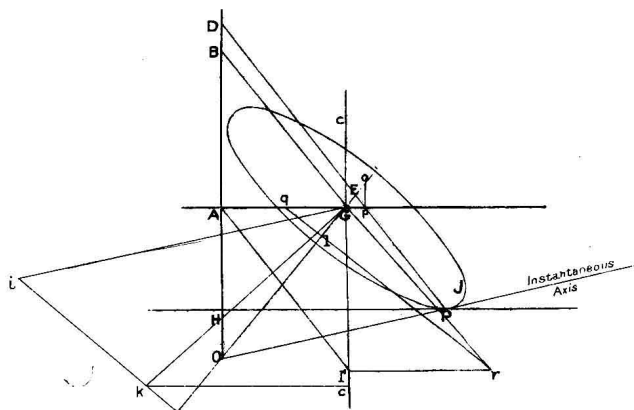
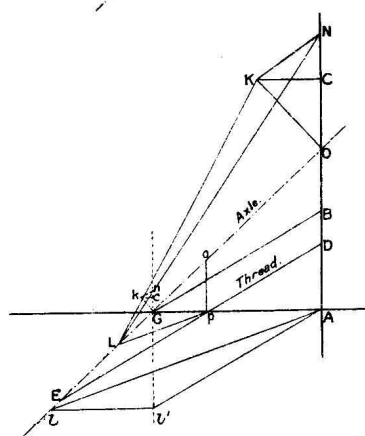
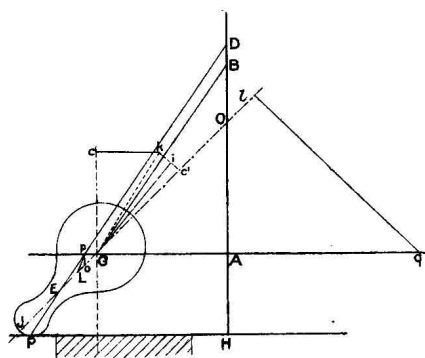
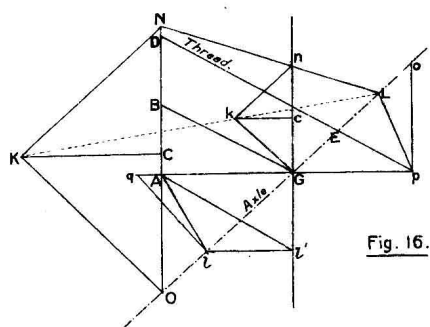


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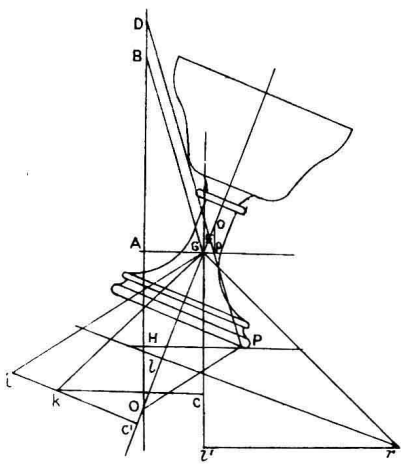


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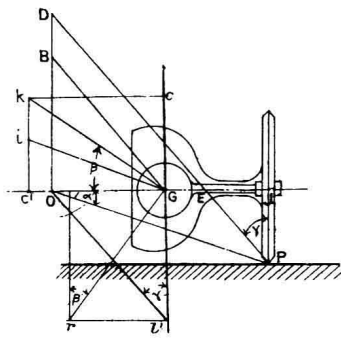


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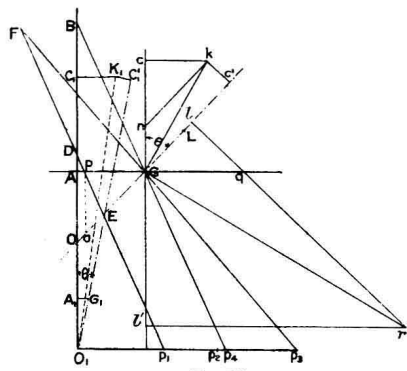


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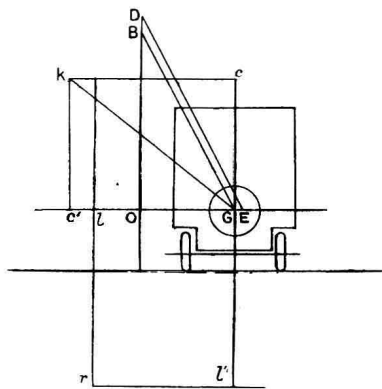


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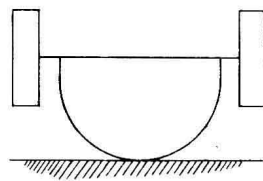


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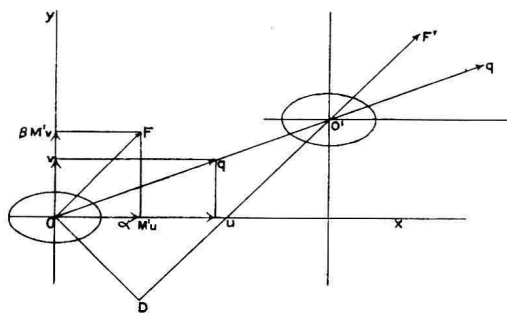


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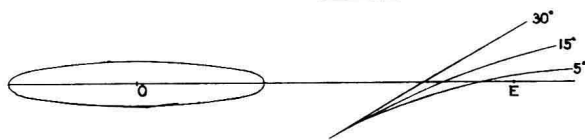


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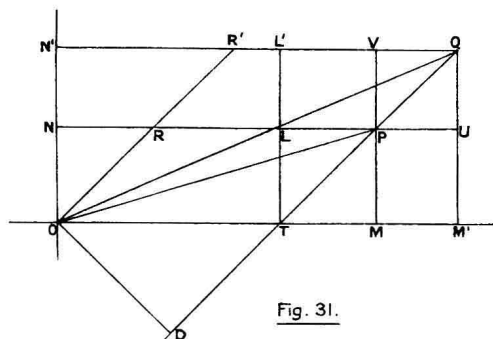


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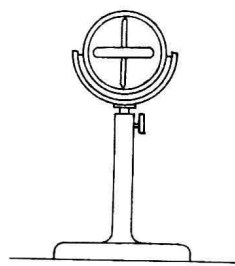


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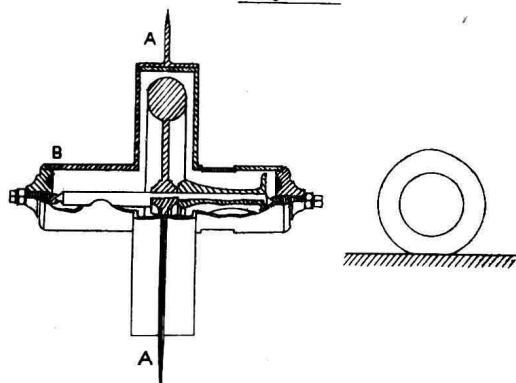


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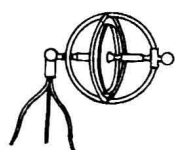


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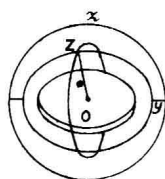


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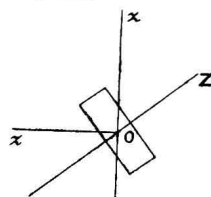


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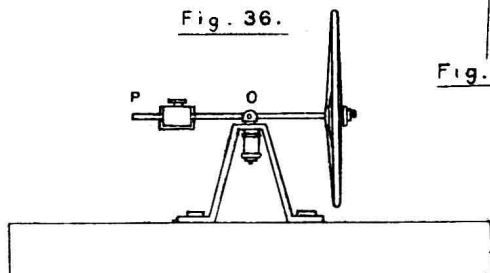


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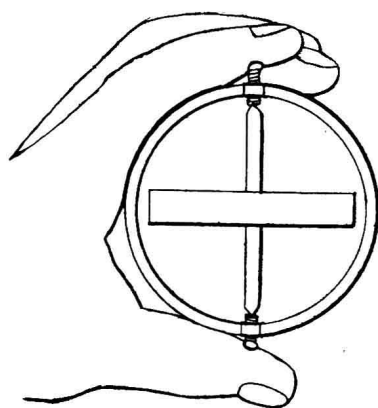
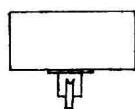
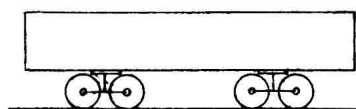


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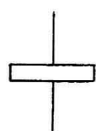


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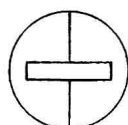


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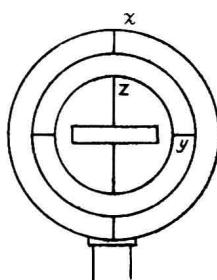


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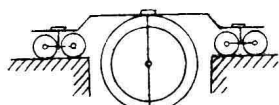


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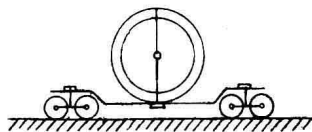


Fig. 45^A

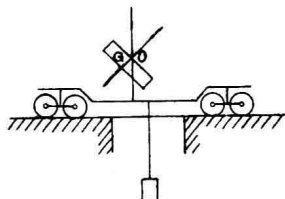


Fig. 44^B

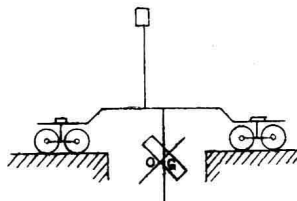


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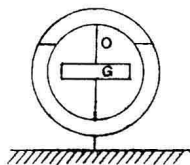


Fig. 44^C

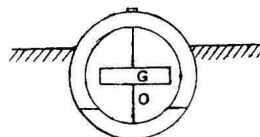


Fig. 45^C

Fig. 46.

p. 30.

Fig. 47.

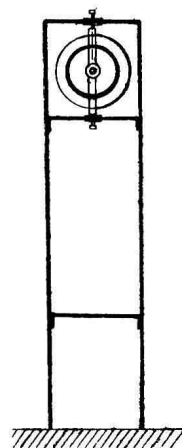
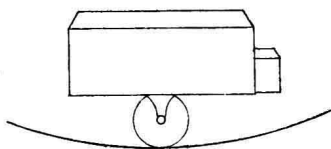
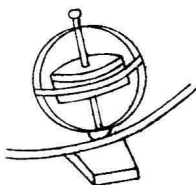


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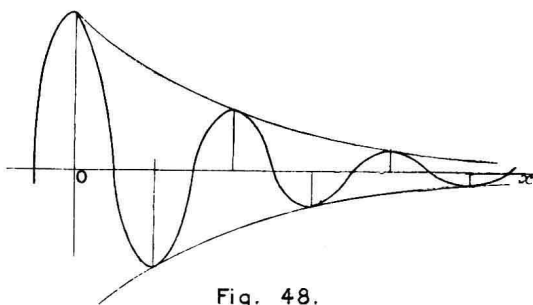


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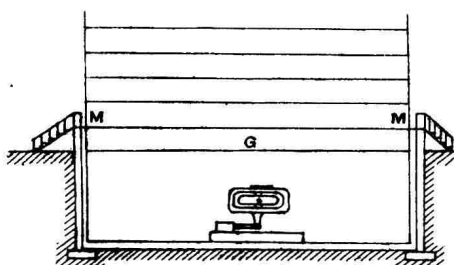


Fig. 50^B

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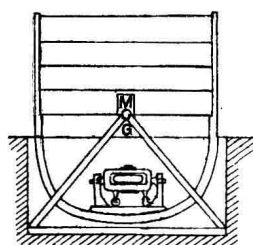
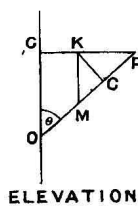


Fig. 50^A



ELEVATION

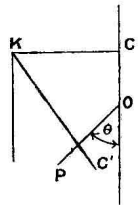
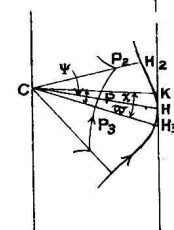
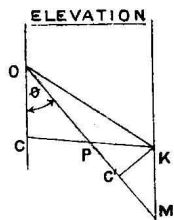
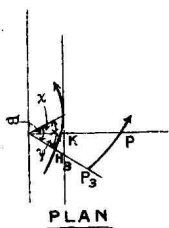


Fig. 52.



PLAN
Fig. 53.



PLAN

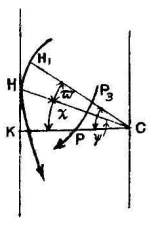


Fig. 51.

p. 42.

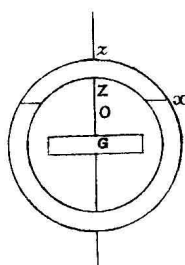


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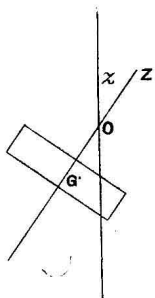


Fig. 57B

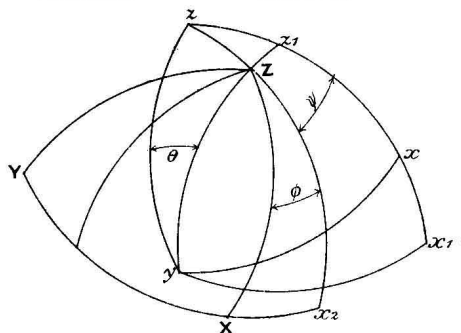


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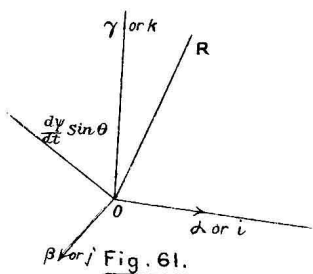


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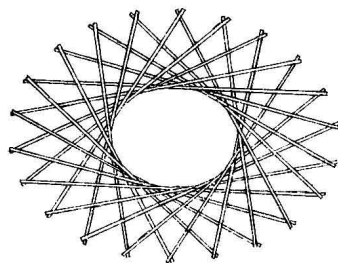


Fig. 62A p. 81.

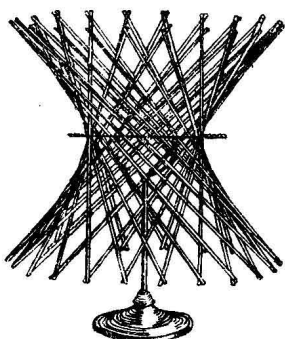


Fig. 62B

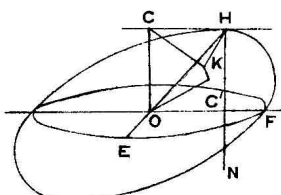


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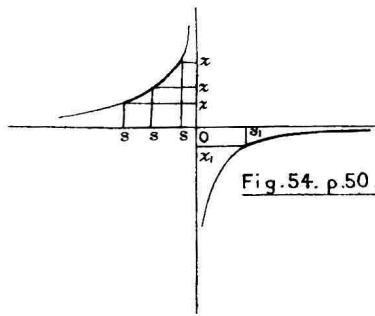


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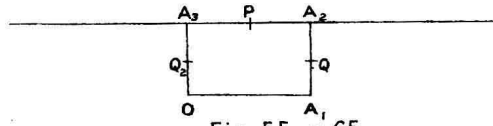


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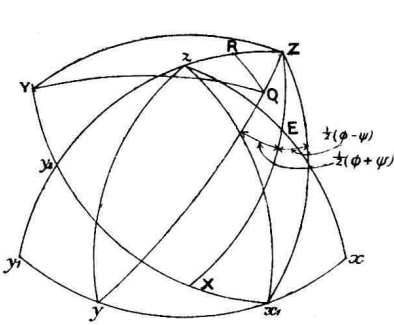


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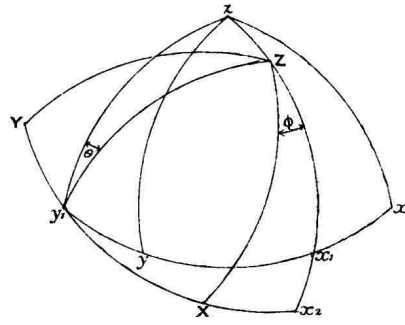


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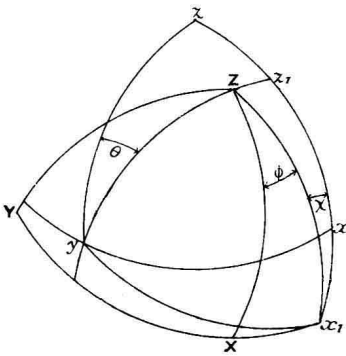


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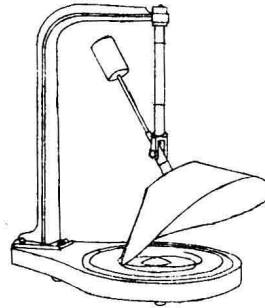


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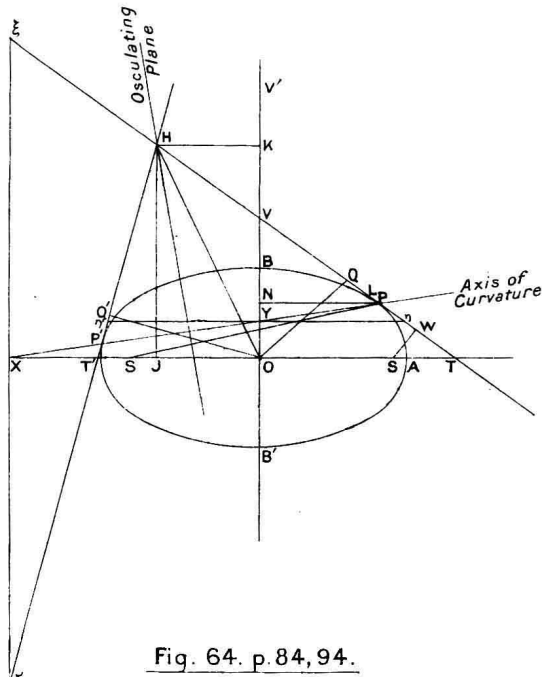


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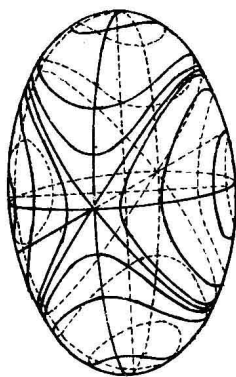


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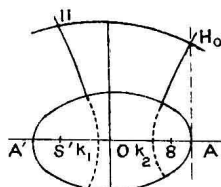


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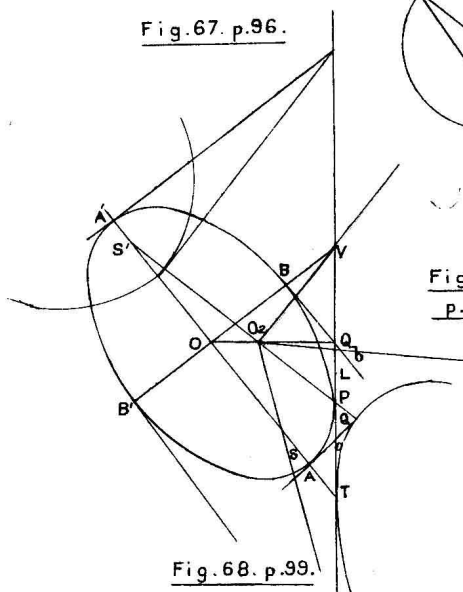


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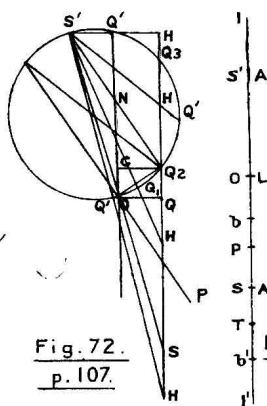


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p. 107.

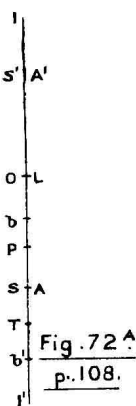


Fig. 72^A.
p. 108.

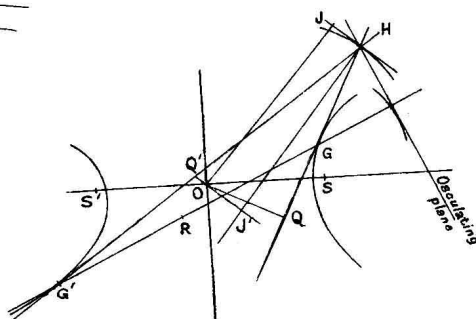


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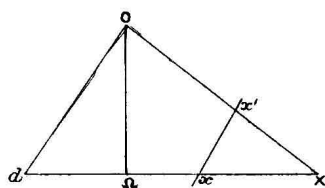


Fig. 76. p. 114.

Fig. 74^A p. 109.

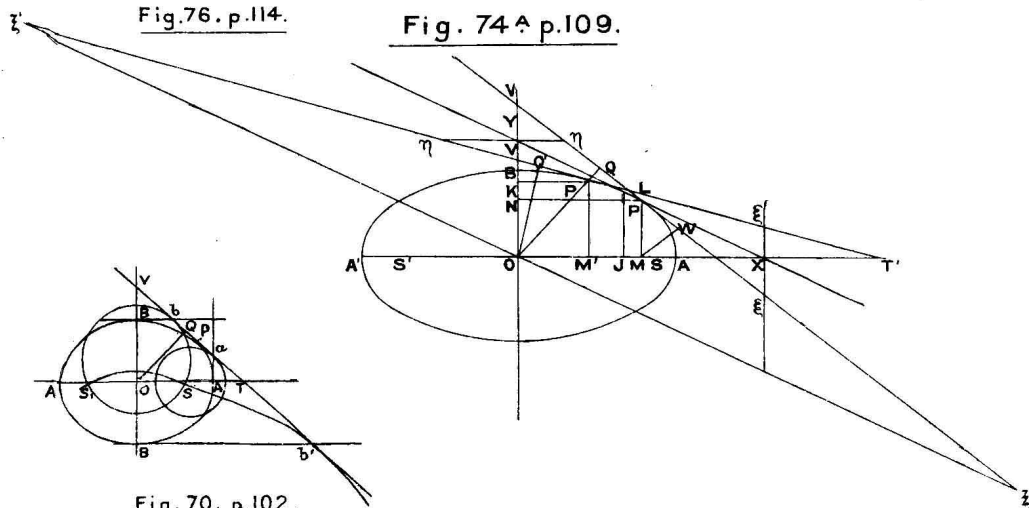


Fig. 70. p. 102.

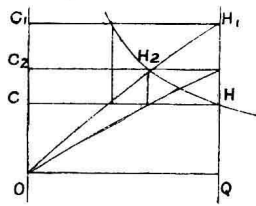


Fig. 71. p. 101.

Fig. 74^B. p. 161.

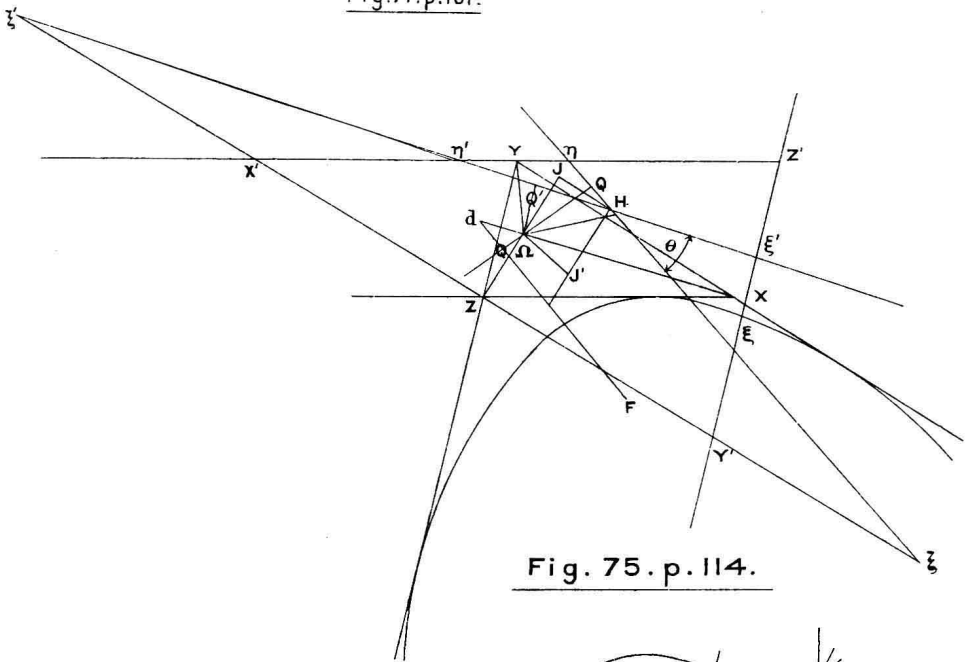
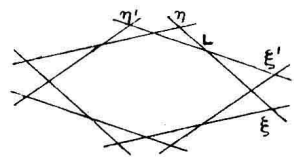


Fig. 75. p. 114.

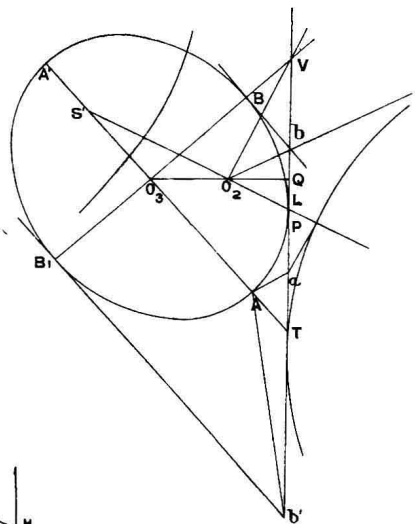


Fig. 77. p. 115.

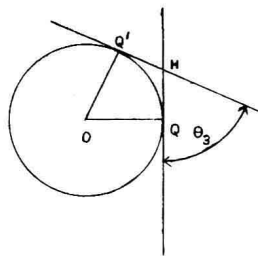


Fig. 73.
p. 109.

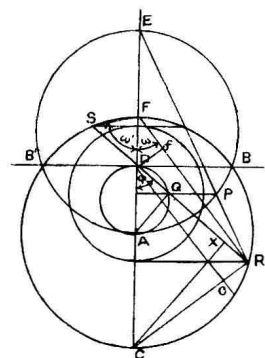


Fig. 78. p. 121.

