PROBLEM 49.—To Describe a Circle Touching Two Given Circles **B C**, **D F**, and One of Them in a Given Point **A**.

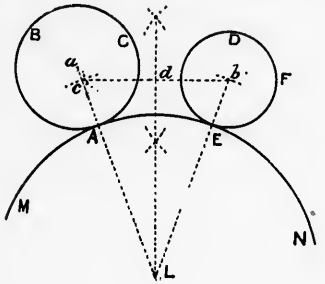


Fig. 1.

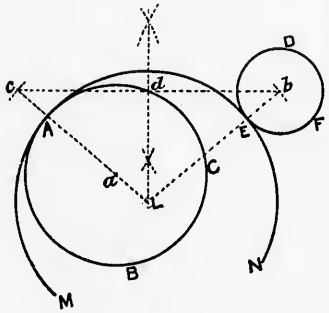


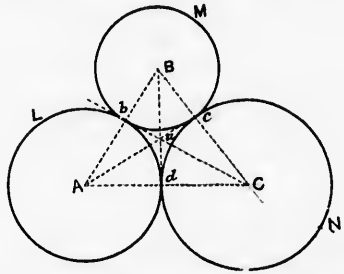
Fig. 2.

Join the point **A** to **a** the centre of the circle **C B**. In this line, or in the line produced, make **A c** equal to the radius of the other given circle **D F**.

Join **b**, the centre of the circle **D E**, to **c**, bisect **c b** in **d**, and draw the perpendicular **d L**, meeting **A a** produced in **L**.

From **L** as centre with the radius **L A**, describe the required circle.

PROBLEM 50.—From the Three Given Points **A**, **B**, **C**, as Centres, to Describe Three Circles Touching Each Other.



Join the given points and bisect the angles **A**, **B** and **C** by lines meeting in **a**.

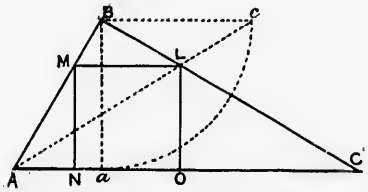
From **a** drop perpendiculars **a b**, **a c**, **a d** on the lines **A B**, **B C**, **C A**, respectively.

With **A** as centre and **A b** or **A d** as radius, describe a circle.

With **B** as centre and **B b** or **B c** as radius, describe a circle which will touch the former in **b**.

With **C** as centre and **C c** or **C d** as radius, describe a circle touching the two former circles in **d** and **c**.

PROBLEM 51.—To Inscribe a Square in any Given Triangle **A B C**.



From the point **B** draw **B a** perpendicular to **A C**. Draw **B c** parallel to **A C** and equal to **B a**.

Join **A c**, cutting **B C** in **L**.

Draw **L M** parallel to **A C**, and **L O**, **M N** parallel to **B a**.

M L O N will be the required square.