interior and opposite upon the same side; and likewise the two interior angles upon the same side together equal to two right angles.

5. Triangles upon the same base, and between the same parallels, are equal to one another.

6. In any right angled triangle, the square which is described upon the side subtending the right angle, is equal to the squares described upon the sides which contain the right angle.

7. If a straight line be divided into any two parts, the square of the whole line is equal to the squares of the two parts, together with twice the rectangle contained by the parts.

8. If a straight line be divided into any two parts the squares of the whole line, and one of the parts, are equal to twice the rectangle contained by the whole and that part together with the square of the other part.

9. In obtuse angled triangles, if a perpendicular be drawn from any acute angles to the opposite side produced, the square of the side subtending the obtuse angle is greater than the squares of the sides containing the obtuse angle, by twice the rectangle contained by the side upon which when produced the perpendicular falls, and the straight line intercepted without the triangle, between the perpendicular and the obtuse angle.

10. If in a circle two straight lines cut one another, which do not both pass through the centre, they do not bisect each other.

11. If two circles touch one another internally, they shall not have the same centre.

12. If two circles touch each other externally, the straight line which joins their centres, shall pass through the point of contract.

13. Upon the same straight line, and upon the same side of it, there cannot be two similar segments of circles, not coinciding with one another-

14. Describe a circle about a given triangle.

15. Inscribe a square in a given circle.

16. Describe a circle about a given equilateral and equiangular pentagon.

MENSURATION.

(Three hours allowed.)

Shew how practically to do the following problems: (1.) To raise a perpendicular from the end of a line without producing it; (2.) To bisect a given rectilineal angle; (3.) To bisect a given right line; (4.) Through a given point to draw a right line parallel to a given right line.

2. Find area of a regular polygon of n sides, inscribed in a circle, whose radius is given; also of a circumscribing regular polygon of same num-

ber of sides, and educe the area of the circle. Find area of a decagon, length of side being 20. If centre of one circle whose radius is 10, be in circumference of another whose diameter is 45, find areas of the three included spaces.

3. What will be the length of a fence reaching from one of the angular points of a triangular field to the longer side; sides being 25, 35, 40 rods; give length of sections of longer side made by fence; find also area of field. Give proofs for the methods you adopt.

4. The top and bottom of a ditch are parallel, breadth at top 72 feet, at bottom $38\frac{2}{3}$, and sloping sides $26\frac{2}{3}$ and 20 feet respectively, find area of a vertical section.

Required, the cost, at 6s. per square yard, of the wainscoting of a room; the height, including cornice and mouldings, being 12 feet 6 inches, and the whole compass 83 feet 8 inches; also the three window shutters, being each 7 feet 8 inches, by 3 feet 6 inches, and the door 7 feet by 3 feet 6 inches which being worked on both sides must be reck-oned work and half work.

6. Find cost of material for making a balloon, at 5 cents per square inch; and also cost of filling at one cent per cubic inch, diameter being 30 feet.

7. Three men buy a grinding stone three feet in diameter, each paying one-third expense; what part of diameter should each grind for his share.

Canadian Patents.

(Continued from page 97 of this Journal.)

BUREAU OF AGRICULTURE AND STATISTICS, PATENT OFFICE, Quebec, 1st July, 1865.— His Excellency the Governor General has been pleased to grant Letters Patent of Invention for a period of *fourteen years*, from the dates hereof, to the persons whose names are included in the following list. Published by command,

J. C. TACHÉ, Deputy to Min. of Agric.

JEREMIAH DAIGNEAU, Yeoman, of Roxton Pond, in the County of Shefford, for "A new and useful Stove Register.—(Dated 15th February, 1865.)

WILLIAM AUGUSTUS LEGGO and GEORGE EDWARD DESBARETS, Engravers, Lithographers and Electrotypists, of the City of Quebec, carrying on business as such under the name and style of William Leggo & Company, for "A new and useful Art of photo-electrotyping to be called Leggotyping."---(Dated 22nd February, 1865.)

DAVID REEKIE, Esquire, of the Township of Georgina, in the County of York, for "A new and useful Lifting-gate."—(Dated 4th March, 1865.)

WILLIAM AUGUSTUS WIGGINS, Machinist, of th Town of Belleville, in the County of Hastings, for "A new and useful Trap Hook, called Wiggins' Trap Hook."-(Dated 4th March, 1865.)