

No. 897,872.

PATENTED SEPT. 8, 1908.

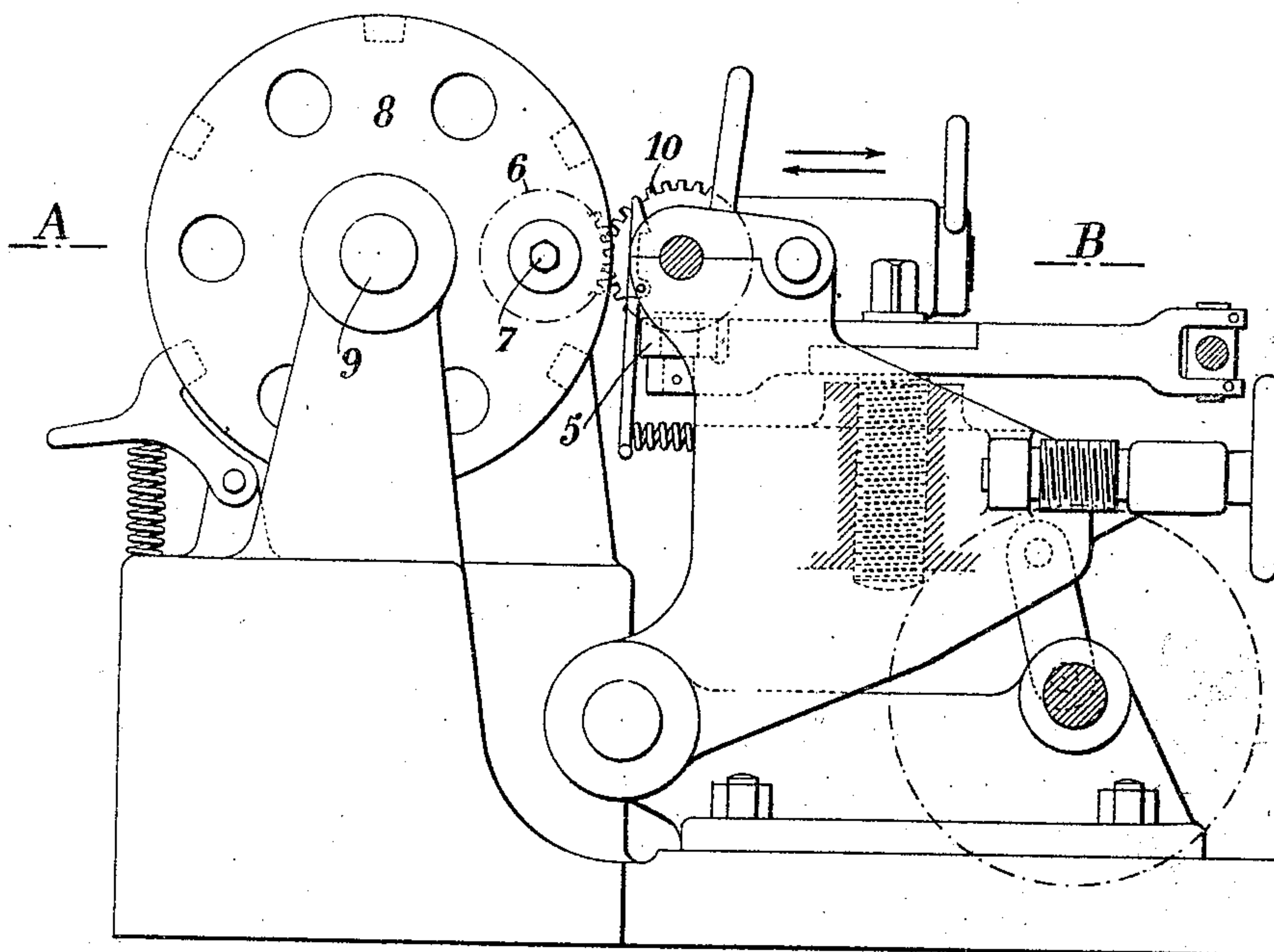
F. A. BRUN.

PROCESS FOR THE MANUFACTURE OF GEAR WHEELS.

APPLICATION FILED NOV. 30, 1906.

2 SHEETS--SHEET 1.

Fig. 1



Witnesses
A. J. Hadden
J. Morrill

Inventor
Fédéric Amédée Gruen
by his Attorney R. A. Adams

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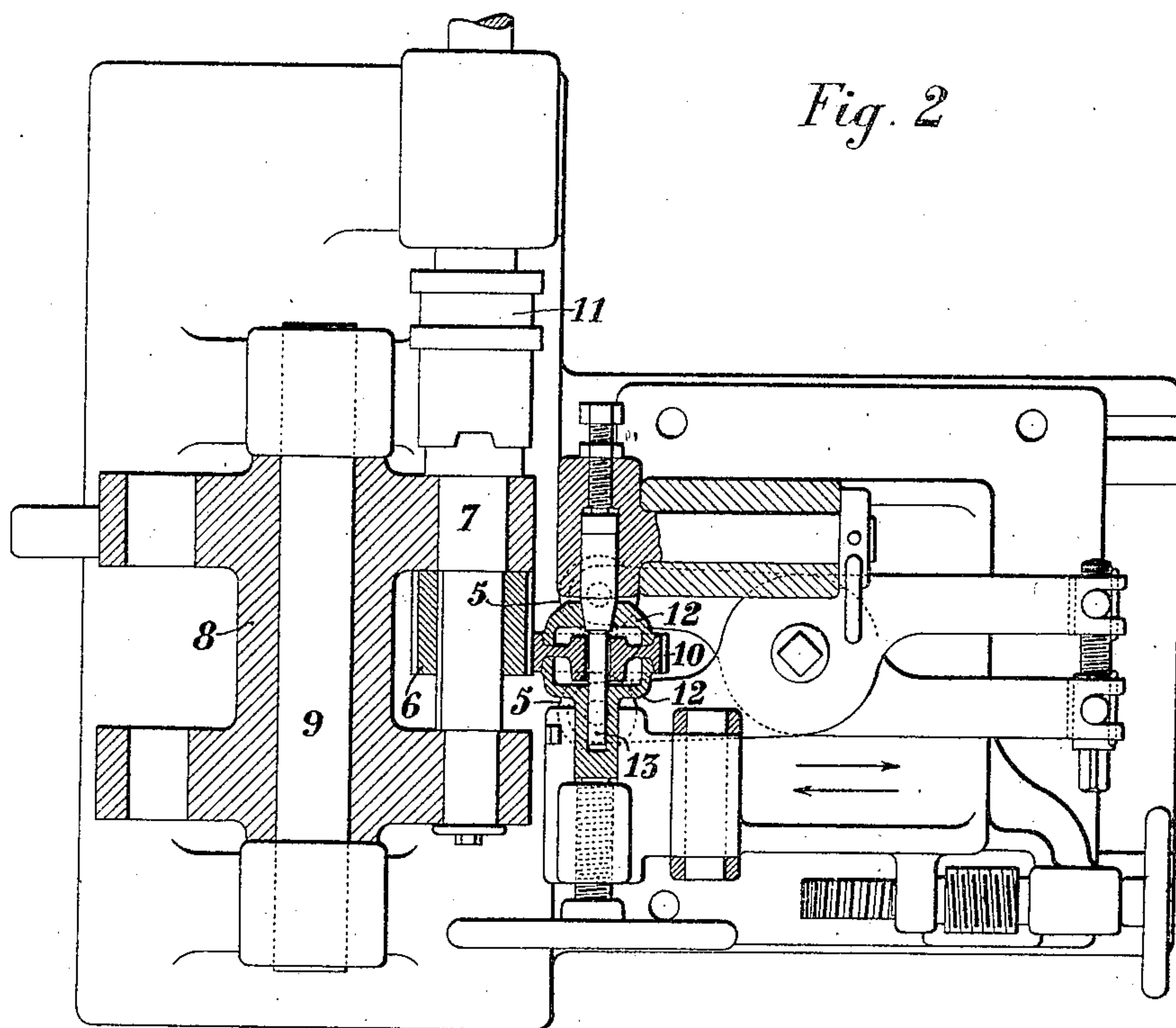


Fig. 2

Fig. 3

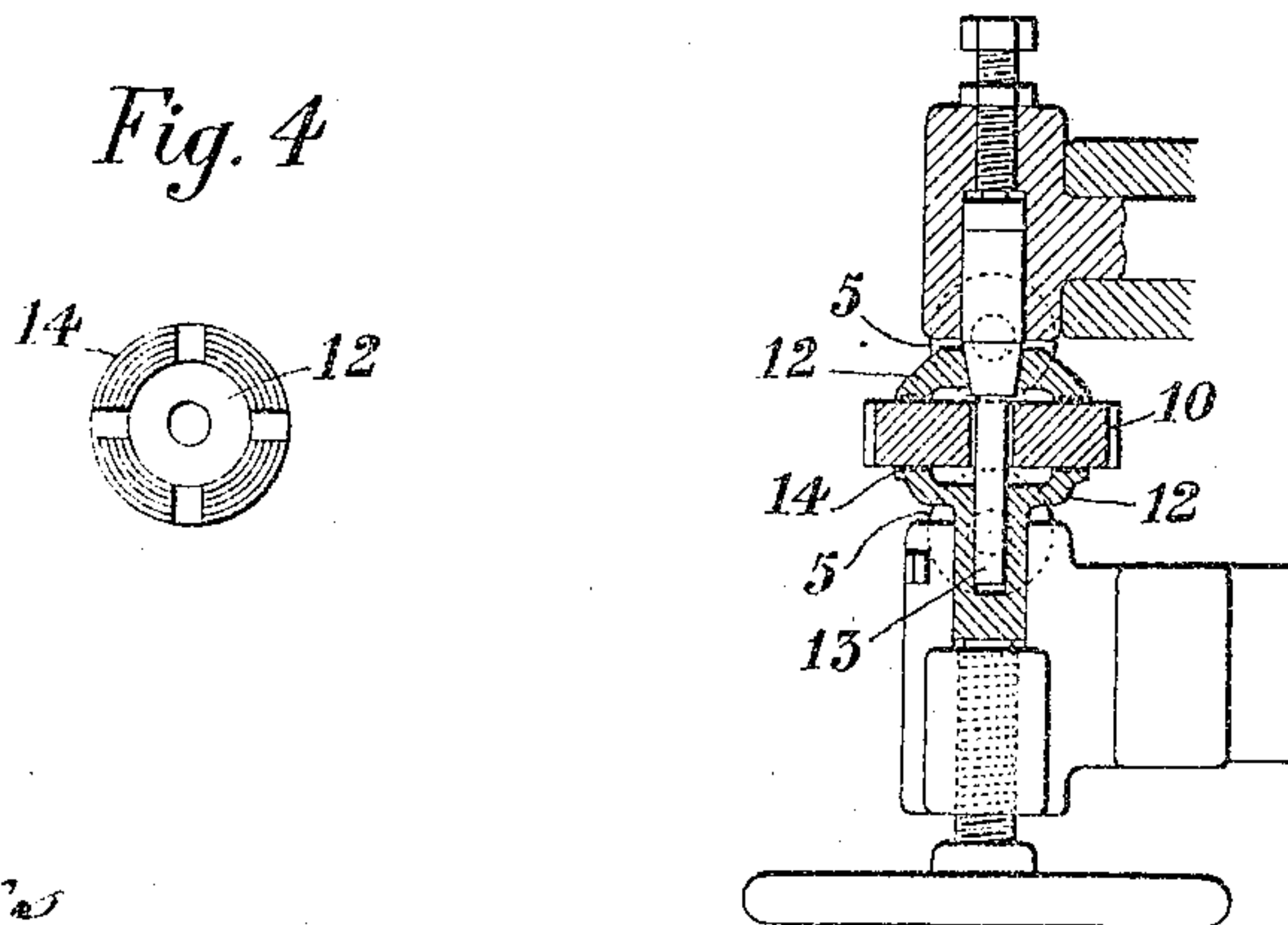


Fig. 4

Witnesses
A. J. Hadden
A. Morrell

Inventor
Frédéric Amédée Brun
by his Attorney *A. Hadden*

UNITED STATES PATENT OFFICE.

FRÉDÉRIC AMÉDÉE BRUN, OF TRABLAINE, NEAR LE CHAMBON-FEUGEROLLES, FRANCE.

PROCESS FOR THE MANUFACTURE OF GEAR-WHEELS.

No. 897,872.

Specification of Letters Patent.

Patented Sept. 8, 1908.

Application filed November 30, 1906. Serial No. 345,781.

To all whom it may concern:

Be it known that I, FRÉDÉRIC AMÉDÉE BRUN, a citizen of the French Republic, residing at Trablaine, near Le Chambon-Feu-
5 gerolles, Loire, France, have invented a Process for the Manufacture of Gear-Wheels, of which the following is a specification.

This invention relates to improvements in the process of manufacturing gear-wheels
10 described in the specification of British Letters Patent No. 25,862 of 1904.

The annexed drawing illustrates an example of apparatus suitable for carrying out the improved process, Figure 1 being a side view
15 thereof, Fig. 2 a plan view partly in section on the line A—B of Fig. 1, and Fig. 3 a horizontal section of the parts supporting the work, Fig. 4 is an elevation of a detail of the apparatus.

20 In the machine illustrated the rolls 5 are vertically and relatively adjustable and serve to laminate the rim of the wheel produced, in order to regulate the thickness thereof (Figs. 1, 2 and 3). A plurality of die-rolls 6
25 fixed to shafts 7 are supported by the rotary bearing-wheel 8 mounted on the shaft 9, so that each die-roll can be moved in succession into position for treating the blank 10, the respective shaft 7 being driven by means
30 of the mechanism 11. If the faces of the blank 10 have been recessed before the teeth are formed the blank is supported by means of the cups or disks 12 (Fig. 2), so that the circumference of the wheel boss does not
35 come into contact with the spindle 13. If the blank is inserted in the form of a flat disk, the latter may be supported by means of cups 12 provided with ribs, teeth or the like 14 to prevent displacement of the blank
40 during the action of the die-rolls (Figs. 3 and 4).

It is absolutely essential that the pressure of the dies does not re-act on the circumference of the boss but on supporting rolls such
45 as those referred to in British specification No. 11870 of 1906, or on the supporting cups 12 shown in the annexed drawing. If the blank were directly mounted on the spindle 13, the pressure exerted by the die-rolls
50 would, owing to the high temperature of the blank, cause the boss of the latter to be distorted, and the indentation produced would be irregular, in some cases to the extent of comprising an incorrect number of teeth.

In British specification No. 11870/1906 it 55 is stated that the operations of lamination and indentation may be separately effected, but it must be understood that the operation of indentation may be combined either with lamination of the sides of the teeth alone or
60 with lamination of the sides of the teeth and the sides of the wheel, as shown in Figs. 1, 2 and 3. For this purpose the adjustable rolls 5 are used, the said rolls being preferably arranged in the position indicated in order to
65 allow of producing wheels with teeth of any given axial length with the aid of die-rolls 6 of any thickness.

The indentation may be effected by means of a single die-roll instead of by means of a 70 plurality of rolls used in succession and mounted in bearings such as those provided by the wheel 8. The process may be so conducted that it comprises, firstly, the operation of marking or notching the circumfer- 75
ence of the blank by means of a toothed roll of a certain diameter and with teeth of the same pitch as those to be impressed, and secondly, the operation of enlarging the notches by means of a die-roll or a succession of die- 80
rolls until the work is finished.

In all cases the indentation is effected without invariable connection between the centers and without reaction on the center of the work. The driven member, whether 85
wheel, roll or die, may have continuous or alternating circular movement.

What I claim as my invention and desire to secure by Letters Patent of the United States is:— 90

1. In the process of manufacturing toothed wheels by circular lamination and impression of heated blanks, the operation consisting in rolling a die roll on the circumference of the blank and at the same time 95
laminating the lateral faces of the teeth and the rim of the wheel, the blank being supported at points between the central boss of the blank and the circumference and in such a way that the rolling of the die wheel takes 100
place without reaction on the central boss of the blank.

2. In the process of manufacturing gear wheels by circular lamination and impression of heated blanks, the operation consisting in 105
rolling on the circumference of the blank a plurality of successively acting die-rolls of different configurations and at the same

time laminating the lateral faces of the teeth and rim of the wheel, the blank being supported at points between the central boss of the blank and the circumference, and in such a way that the rolling of the successive die wheels takes place without reaction on the central boss of the blank.

In witness whereof I have signed this specification in the presence of two witnesses.

FRÉDÉRIC AMÉDÉE BRUN.

Witnesses:

VERDI AUGUSTIN JOSEPH MERLLI,
FERDINAND EMILE XAVIER LAUDY.