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Patented May 2, 1899.

R. F. DALY.
DIFFERENTIAL GEAR.

(Application filed Aug. 16, 1898.)

(No Model.)

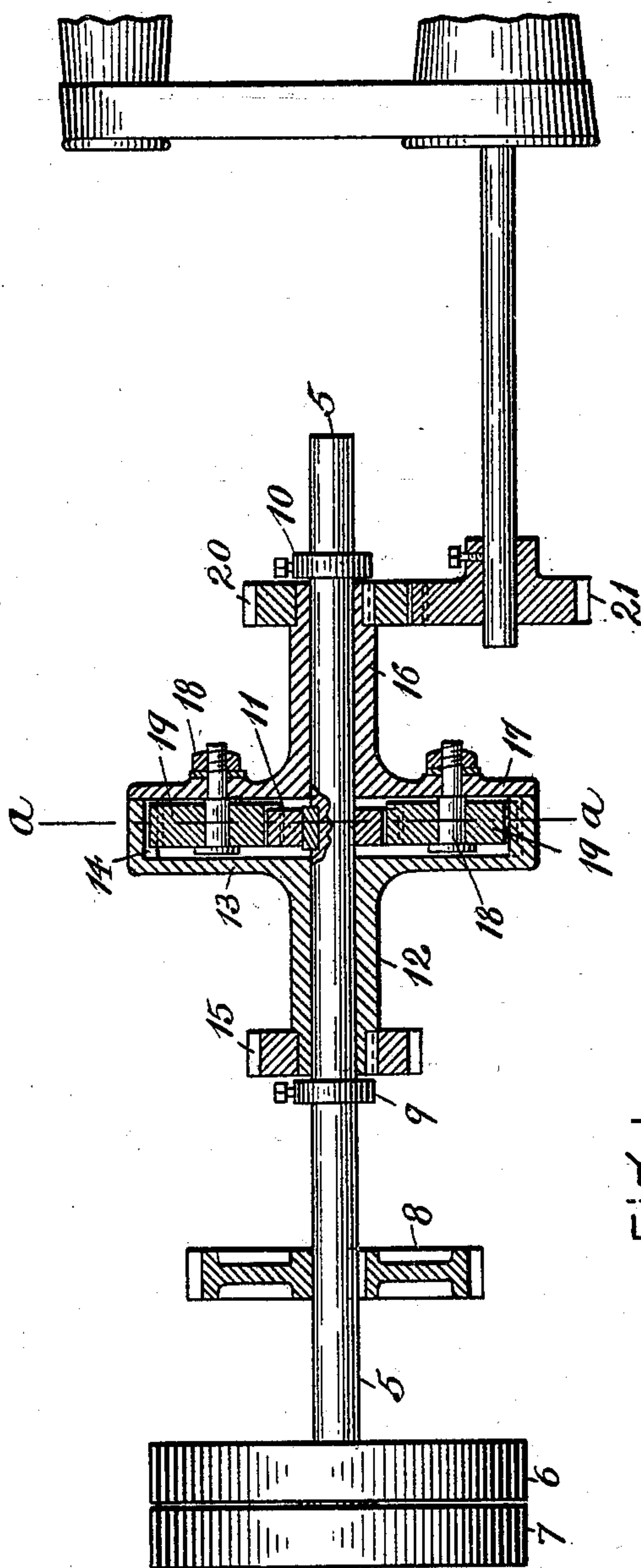


Fig. 1.

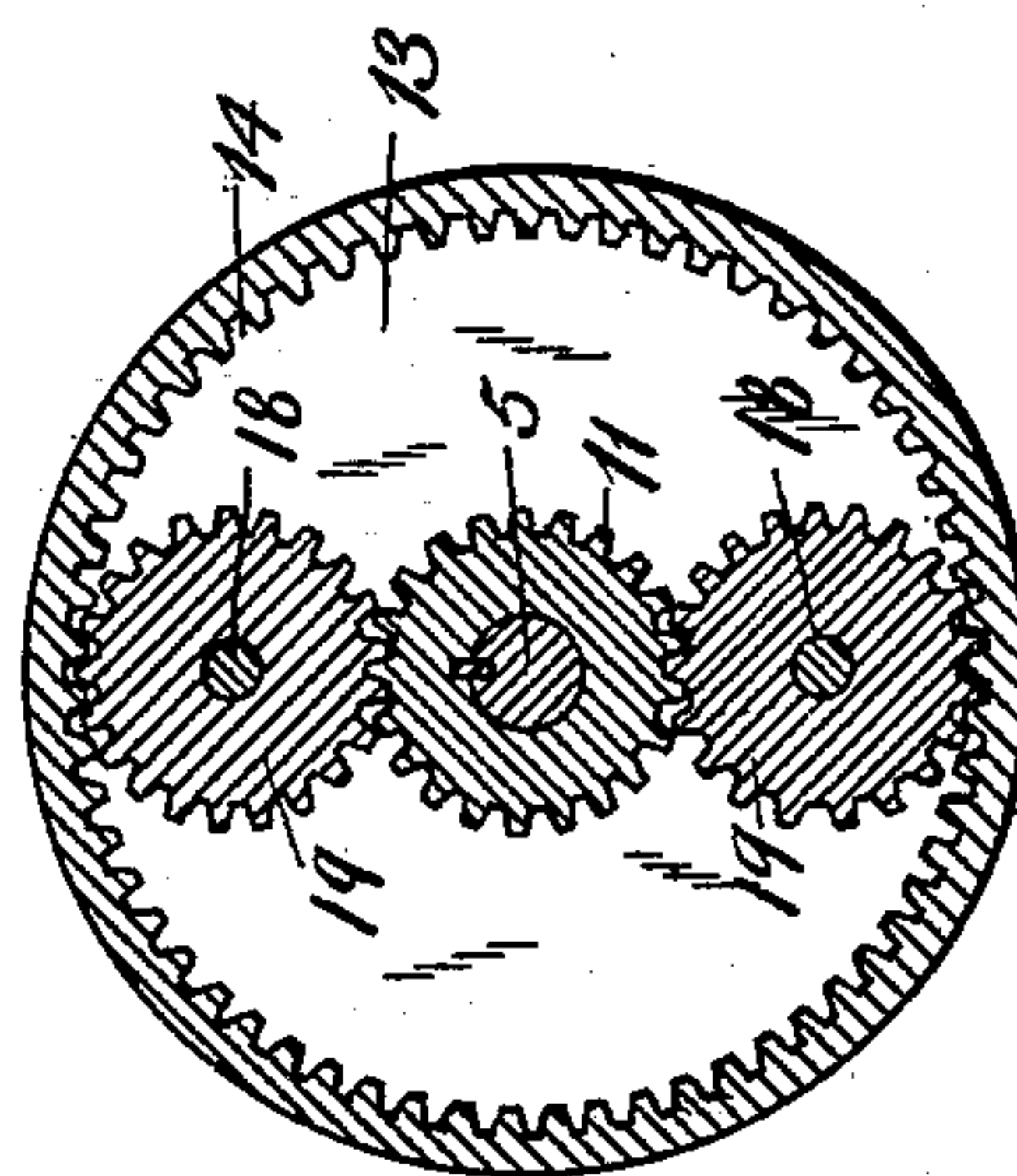


Fig. 2.

WITNESSES

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UNITED STATES PATENT OFFICE.

RICHARD F. DALY, OF WOONSOCKET, RHODE ISLAND.

DIFFERENTIAL GEAR.

SPECIFICATION forming part of Letters Patent No. 624,186, dated May 2, 1899.

Application filed August 16, 1898. Serial No. 688,691. (No model.)

To all whom it may concern:

Be it known that I, RICHARD F. DALY, of Woonsocket, in the county of Providence and State of Rhode Island, have invented certain
5 new and useful Improvements in Differential Gear; and I hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification.
10

This invention has reference to improvements in differential gear or compound gear used in spinning-machines, and particularly in that class of spinning-machines known as
15 "roving-machines."

The object of the invention is to simplify the construction of differential gear.

Another object of the invention is to so construct a differential gear that it may be
20 rendered more sensitive to the action of the cone-driver in regulating the speed of the bobbin in proportion to the added layers of roving wound thereon.

Another object of the invention is to reduce the external size of the differential gear
25 and to render the same more compact and less liable to injury.

The invention consists in the combination, with the main shaft, of a gear fixed thereon, a
30 gear loosely mounted on said shaft and adapted to be connected with the bobbins to drive the same, a gear also loose on said shaft and adapted to be connected with the cone-driving motions, and a series of gears forming
35 driving connection between a member of said bobbin-gear and said fixed gear.

The invention also consists in such other novel features of construction and combination of parts whereby the objects of the invention are carried into effect, as shall hereinafter be more fully described, and pointed
40 out in the claim.

Figure 1 represents a vertical sectional view of the improved differential gear mounted on the drive-shaft and in connection with portions of the cone-driver. Fig. 2 represents a cross sectional view of the same, taken on line
45 a a, Fig. 1.

Similar numbers of reference designate corresponding parts throughout.

Differential gears of the nature herein de-

scribed are used in roving-machines for the purpose of regulating the driving of the bobbins in accordance with the movements of the belt on the driving-cones, so that as layer
55 after layer of roving is wound on the bobbins and the diameter of the same is thus increased the speed of the bobbin controlled through the cone-driver and the differential gear may be reduced in proportion to its in-
60 crease of diameter to receive the roving without unduly stretching the same.

Owing to the complicated nature of the roving-machines it is important that the parts should be as simple, compact, and durable as
65 possible. In carrying my invention into practice I have sought to improve this mechanism in this direction of simplicity and durability.

In the drawings, 5 designates the drive-shaft of a roving or similar machine, having
70 the usual fast and loose pulleys 6 and 7 and provided with the gear 8, representing the spindle drive-gear in a roving-machine, and the collars 9 and 10, secured to the shaft by set-screws.
75

Fixed on the shaft 5 is the central gear 11, at one side of which the sleeve 12 is journaled on the shaft and bears against the collar 9. This sleeve is furnished with the laterally-enlarged casing member 13, having the internal
80 gear 14, and on this sleeve is fixed the gear 15, representing the bobbin drive-gear of a roving-machine.

On the shaft 5 and separated from the sleeve 12 by the gear 11 is journaled the
85 sleeve 16, held from outward movement along the shaft by the collar 10 and having the enlarged plate 17 for closing the open side of the casing member 13. On the plate 17 are mounted stud-shafts 18 18, on which are jour-
90 naled idle pinions 19 19, meshing with the teeth of the central gear 11 and of the internal gear 14, while at the outer end of the sleeve 16 is fixed the gear 20.

The gear 21 is the usual gear on the shaft
95 of the cone-driver, which is of any usual construction.

When the shaft 5 and the gear 21 are both driven at equal speed, it will be apparent that the gears 8 and 15 will be driven in the
100 same relation; but as the belt on the cones is moved to regulate the speed of the gear 21 a

differential action is set up in the operation of the gear 15, while the speed of the gear 8 remains constant. At first the pinions 19 merely serve as connections between the gear 11 and the internal gear; but as the speed of the gear 21 increases or diminishes from that of the shaft 5 the sleeve 16 will be rotated in independent relation to the shaft 5, and the pinions 19, working on the gear 11 and the internal gear 14, will cause the speed of the casing 13, the sleeve 12, and the gear 15 to be changed in proportion and will reduce or increase (generally reduce) the speed of the bobbins.

15 By this construction I reduce the number of parts in a device of this nature and render it compact and sensitive to the control of the cone-driver.

Having thus described my invention, I

claim as new and desire to secure by Letters Patent—

The combination with the shaft 5, and the gears 8 and 11 fixed thereon, of the sleeve 12 journaled on the shaft between said gears and having the casing 13 with the internal gear 14, and the gear 15 fixed on said sleeve, the sleeve 16 journaled on the shaft 5 at the opposite side of the gear 11 and having the plate 17, the shafts 18 18 secured in said plate, the gears 19 19 journaled on said shafts and intermeshing with the gear 11 and with the internal gear 14, and the gear 20 fixed on the outer end of the sleeve 16, as herein shown and described.

RICHARD F. DALY.

Witnesses:

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WALTER J. DAVIS.