

No. 846,086.

PATENTED MAR. 5, 1907.

G. E. BOUVIER & J. N. PROULX.

GEARING.

APPLICATION FILED SEPT. 6, 1906.

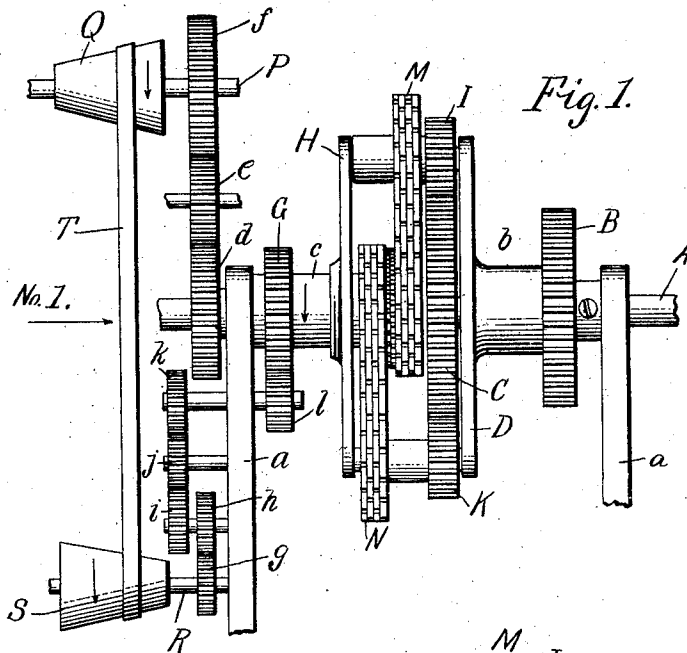
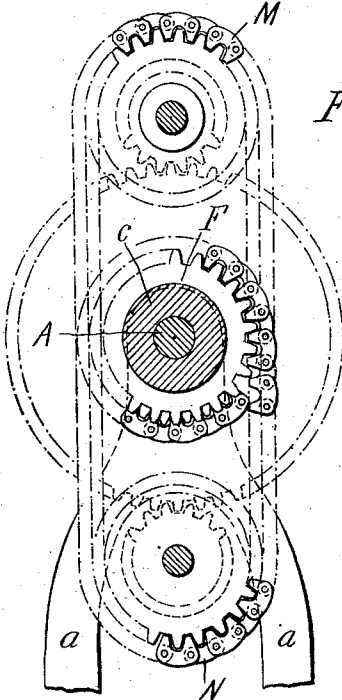


Fig. 2.

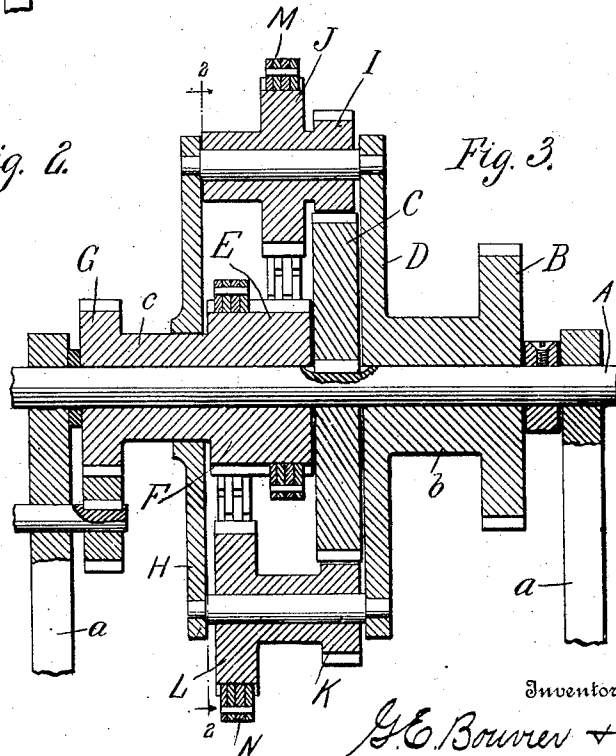


Fig. 3.

Witnesses

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GEARING.

No. 846,086.

Specification of Letters Patent.

Patented March 5, 1907.

Application filed September 6, 1906. Serial No. 333,491.

To all whom it may concern:

Be it known that we, GEORGE E. BOUVIER and JOSEPH N. PROULX, citizens of the United States, residing at Woonsocket, in the county of Providence and State of Rhode Island, have invented new and useful Improvements in Gearing, of which the following is a specification.

Our invention pertains to differential driving connections, and it contemplates the provision of a reliable and otherwise advantageous differential driving connection for regularly decreasing the speed of the bobbins in a fly-frame as the bobbins are filled and increased in diameter, this with a view of assuring all of the yarn on the bobbin being given the same amount of tension as is desirable.

The invention will be fully understood from the following description and claims when the same are read in connection with the accompanying drawings, forming part of this specification, in which—

Figure 1 is an elevation of the differential driving connection or gearing constituting the present and preferred embodiment of our invention. Fig. 2 is an enlarged transverse section taken in the plane indicated by the line 2 2 of Fig. 3 looking in the direction indicated by the arrow, and Fig. 3 is a detail vertical section taken at a right angle to Fig. 2 and illustrating the salient features of our novel differential connection.

Similar letters designate corresponding parts in all of the views of the drawings, referring to which—

A is the main shaft of a fly-frame, which is illustrated as journaled in standards a.

B is a gear, preferably a spur-gear, loosely mounted on the main shaft and from which by any suitable means (not illustrated) motion is taken to drive the bobbin. (Also not illustrated.)

C is a spur-gear, keyed or otherwise made fast to the main shaft A, so as to turn therewith.

D is a frame-plate arranged at one side of the gear C and connected, through a sleeve b, with the gear B.

E and F are gears, preferably sprocket-gears, formed of one piece, as shown, or otherwise fixed with respect to each other and loosely mounted on the main shaft A at the opposite side of the gear C with reference to

the frame-plate D and connected, through a sleeve c, with a spur-gear G.

H is a frame-plate loosely receiving the sleeve c.

I and J are a spur-gear and a sprocket-gear formed integral with or otherwise fixed to each other and mounted between the frame-plates D and H at one point, and K and L are a spur-gear and a sprocket-gear formed integral with or otherwise fixed to each other and mounted between the frame-plates D and H at a diametrically opposite point with reference to the gears I and J. The spur-gears I and K are intermeshed with the spur-gear C, while the sprocket-gears J and L are connected, through sprocket-belts M and N, with the sprocket-gears E and F, respectively.

P is a shaft journaled in a suitable fixed bearing and driven from the main shaft A through the train of gears d, e, and f. Q is a cone-pulley fixed to said shaft P. R is a shaft also journaled in a suitable fixed bearing and connected by a train of gears g, h, i, j, k, and l with the gear G.

S is a cone-pulley fixed on the shaft R and disposed opposite to the cone-pulley Q, and T is a belt connecting the pulleys Q and S. This belt T is caused by the well-known means, which we have deemed it unnecessary to illustrate, to travel back and forth lengthwise of the cone-pulleys, its movement being in the direction indicated by arrow No. 1 while the bobbins are being filled with yarn, so as to gradually decrease the speed of the pulley S and, through the train of gears described, the speed of the gear G.

Now when it is remembered that motion is taken from the gear B to drive the bobbins (not shown) and that motion is transmitted from the gear G to the gear B through the medium of the sprocket-gears E and F the sprocket-belts M and N, the sprocket-gears J and L, and the frame-plate D and that the sprocket-gears J and L are fixed to spur-gears I and K, which are intermeshed with the gear C, fast on the main shaft A, it will be appreciated that the speed of the gear B, which drives the bobbins, is automatically governed, and the tension in the yarn is always kept the same, which is an important desideratum.

The foregoing will be better understood when it is stated that when the shaft A is rotated and no resistance is offered to any part of the driving connection the said shaft A,

the gear B, the frame-plates D and H, the gear G, and the parts carried by the said frame-plates will turn as one piece. When, however, the turning of the gear G is resisted
 5 or retarded, the main shaft A will turn faster than the gear B in about the ratio of twenty-seven to twenty.

The construction shown and described constitutes the preferred embodiment of our invention; but we desire it understood that in
 10 practice such changes in the form, construction, and relative arrangement of parts may be made as fairly fall within the scope of our invention as claimed.

15 Having described our invention, what we claim, and desire to secure by Letters Patent, is—

1. The combination in a differential driving connection, of two oppositely-disposed
 20 cone-pulleys, a belt connecting the same, a main shaft, a spur-gear fast thereon, a gear from which motion is to be taken loosely mounted on the main shaft, a frame movable with the latter gear, a spur-gear carried by
 25 the frame and intermeshed with and movable around the spur-gear fast on the shaft, a gear fixed with respect to the said spur-gear of the frame, a gear loose on the shaft and connected with the last-claimed gear, a driving
 30 connection intermediate the main shaft

and one of the cone-pulleys, and a driving connection intermediate the other cone-pulley and the last-mentioned gear loose on the shaft.

2. The combination in a differential driving connection of two oppositely-disposed
 35 cone-pulleys, a belt connecting the same, a main shaft, a spur-gear fast thereon, a gear from which motion is to be taken, loosely mounted on the main shaft, a frame movable
 40 with the latter gear, a spur-gear and a sprocket-gear fixed with respect to each other and carried by the frame; the spur-gear being intermeshed with and movable around the spur-gear fast on the shaft, a sprocket-gear
 45 loose on the shaft, a sprocket-belt connecting said sprocket-gear and the first-mentioned sprocket-gear, a driving connection intermediate the main shaft and one of the cone-pulleys, and a driving connection intermediate
 50 the other cone-pulley and the last-claimed sprocket-gear.

In testimony whereof we have hereunto set our hands in presence of two subscribing witnesses.

GEORGE E. BOUVIER.
 JOSEPH N. PROULX.

Witnesses:

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 EDGAR L. SPAULDING.