

No. 628,469.

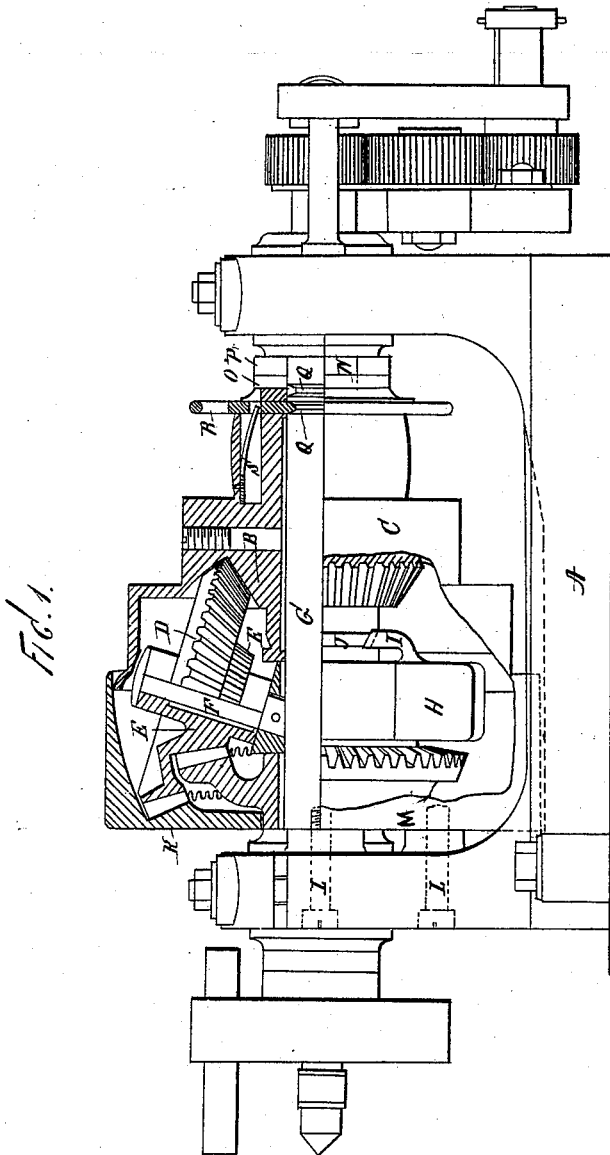
Patented July 11, 1899.

T. HUMPAGE.  
GEARING.

(Application filed Dec. 30, 1897.)

(No Model.)

3 Sheets—Sheet 1.



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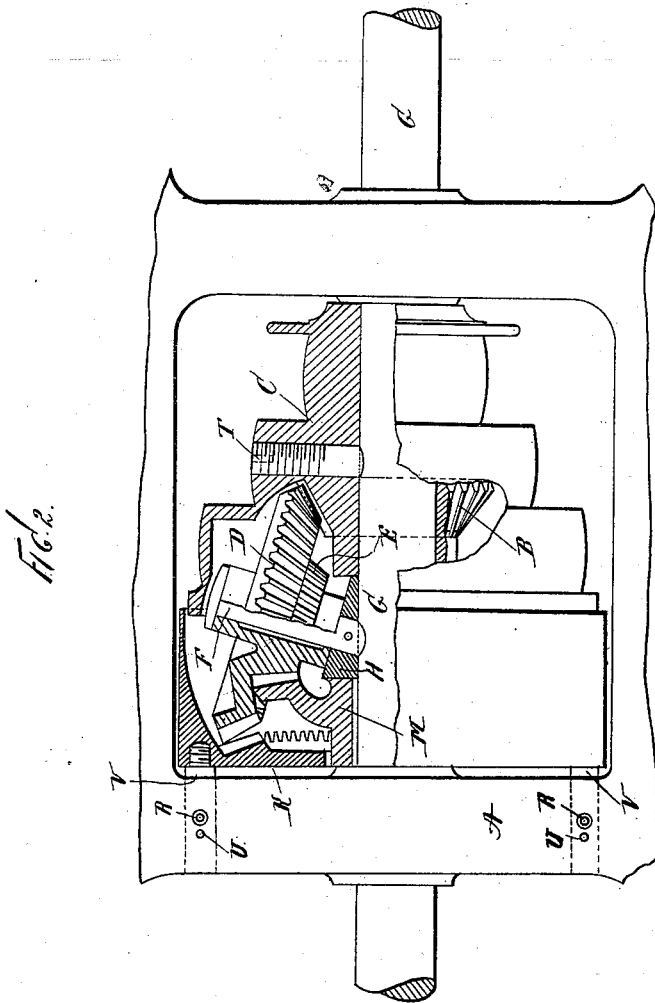
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(No Model.)

3 Sheets—Sheet 2.



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FIG. 3.

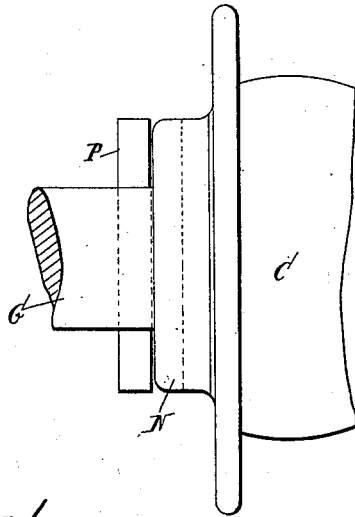


FIG. 4.

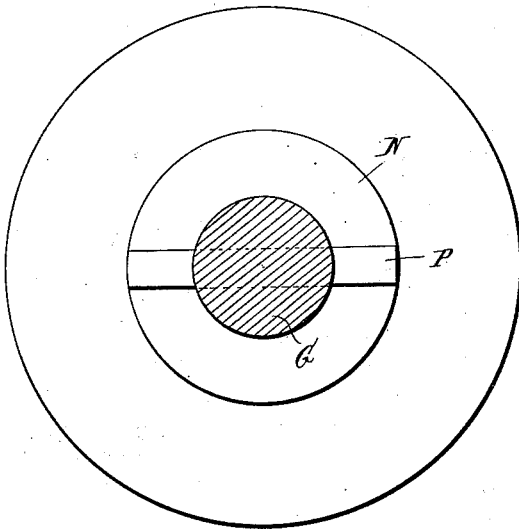
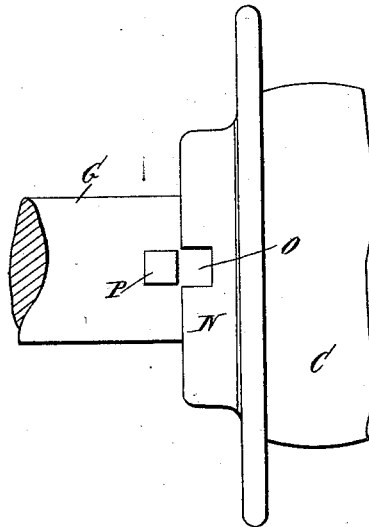


FIG. 5.



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# UNITED STATES PATENT OFFICE.

THOMAS HUMPAGE, OF BRISTOL, ENGLAND.

## GEARING.

SPECIFICATION forming part of Letters Patent No. 628,469, dated July 11, 1899.

Application filed December 30, 1897. Serial No. 664,496. (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS HUMPAGE, a subject of the Queen of Great Britain, residing at Bristol, in the county of Bristol, England, have invented certain new and useful Improvements in Gearing for Lathe Head-Stocks, Drilling-Machines, and Similar Mechanism, of which the following is a full and complete specification, such as will enable those skilled in the art to which it appertains to make and use the same.

This invention relates to improved gearing for lathe head-stocks, drilling-machines, and similar mechanism; and the object thereof is to provide improvements in gearing of this class by means of which the operation thereof is rendered more simple and effective, a further object being to provide gearing for the purpose herein specified, which is simple in construction and operation and strong and durable; and with these and other objects in view the invention consists in the construction, combination, and arrangement of parts hereinafter described and claimed.

The invention is the same as that for which Letters Patent were granted in Great Britain, November 9, 1887, No. 15,289, and is fully disclosed in the following specification, of which the accompanying drawings form a part, in which—

Figure 1 is a sectional side view of one form of my improved gearing; Fig. 2, a view similar to Fig. 1, showing a modified form of construction; Fig. 3, a side view of a detail of the construction; Fig. 4, an end view thereof, and Fig. 5 a view similar to Fig. 3 and showing the parts in a different position.

In the drawings forming part of this specification the separate parts of my improvement are designated by letters of reference, and in the practice of my invention, reference being made to Fig. 1, I provide a head-stock frame A, which is of ordinary type, like that of an ungeared head-stock. A pinion B is cast or otherwise fixed to the boss inside the cone-pulley C. A wheel D, which is driven by the said pinion B, is bell-shaped, in which a small pinion E is cast. Both wheel and pinion revolve on a turned bolt or pin F, which is fixed at an angle to the axis of the shaft or mandrel G, said angle being between forty-five and ninety degrees to the

axis of the shaft. The bolt being at an angle brings the teeth of the wheel D to gear with the small pinion B, which is cast to the cone-pulley. The said wheel D is capable of gearing on the opposite side into a gear K of larger diameter. The bolt F or pin on which the wheel and pinion revolve is fixed to a casting H, through which a hole is bored of such a size as to make a slack fit for the shaft or mandrel. On either side of the bored hole are cast lugs I, capable of fitting slack into a groove J, cut in the boss of the pinion B or cone-pulley. The casting H is extended beyond the shaft or mandrel to counterbalance the wheel D and pinion E.

The bell-shaped wheel D, which gears into the pinion B on the cone-pulley, also gears into a gear K, which does not revolve and is fixed to the head-stock casting A. The small pinion E, which is cast to the bell-shaped wheel D, gears into a wheel M, which is keyed to the shaft or mandrel G.

The outer boss N of the cone-pulley has a slot O cut across and through its diameter, capable of fitting a key-pin P, which is fixed in or passed through the shaft or mandrel, projecting on each side to correspond to the diameter of the outside boss of the cone-pulley, as best shown in Figs. 3 to 5. Two grooves Q Q are cut in the shaft or mandrel near the rear bearing. A flat bolt or slide R is fitted in the flange of the cone-pulley at right angles to the axis of the shaft or mandrel. The end of the bolt or slide R fits (free to revolve) in either of the grooves Q Q, which keeps the gearing in or out of motion. A spring S is used to keep the bolt or slide in position.

The cone-pulley C and pinion being moved about the axis of the shaft or mandrel causes the bell-shaped wheel D and pinion E into which it gears to revolve about their axes, at the same time being in gear with the gear K, which causes the said wheel D and pinion E and casting H, to which they are fixed, to move bodily in the same direction as the cone-pulley around the axis of the shaft or mandrel G. The wheel M, which is keyed to the shaft or mandrel, being in gear with the small pinion E, which is cast to the bell-shaped wheel D, is moved slowly in the same direction as the cone-pulley C. To disconnect the gearing, draw the bolt or slide R outward with

the finger and thumb. Then slide the coned pulley C back endwise, which draws by means of the two lugs I the counterbalance H, the wheel D, and the pinion E, which are cast together, out of gear from the ring of metal K and the wheel M, which is keyed to the shaft or mandrel G. At the same time the outer boss N of the cone-pulley C is geared with the key-pin P, which is fixed through the shaft or mandrel G. The bolt R or slide will then move by means of the spring S into the outer groove Q in the shaft or mandrel G, which will retain the cone-pulley C and the wheels D and E in the latter position.

In Fig. 2 I have shown a modification consisting of an arrangement for putting the wheels in or out of gear by means of the gear K, which is capable of being moved into gear with the wheel D and which when in gear with said wheel D is fixed firmly to the casing or casting A by means of set-screws R, the points of which fit in countersunk holes U in the guides V, which are free to move in said casing or casting and which are provided with screw-threaded inner ends, which enter corresponding sockets in the outer face of the gear K. The cone-pulley C in this case is made fast to the shaft G by a set-screw T, and the other features of construction and the operation are the same as the construction shown in Fig. 1 and hereinbefore described. The cone-pulley C is then made fast to the shaft G by means of a set-screw T. All the other parts are as shown and explained in Fig. 1.

Having fully described my invention, I claim as new and desire to secure by Letters Patent—

1. In a gear for the purpose herein described, the combination with a frame, of a shaft or mandrel passing therethrough, a cone-pulley mounted thereon and provided with an internal beveled gear, a support mounted on the shaft adjacent to the beveled gear and provided with a bolt or pin supported at an angle to said shaft, a beveled gear-wheel as D mounted on said bolt or pin and adapted to operate in connection with said beveled gear on the pulley, a beveled pinion connected with the beveled gear-wheel D, and on the inner side thereof, a beveled gear-wheel mounted on the shaft or mandrel adjacent to said support and operating in connection with said pinion, a stationary gear connected with the frame or casing adjacent to said last-named gear-wheel, and through which the shaft or mandrel passes, said stationary gear being adapted to operate in connection with the beveled gear-wheel D, and means for throwing the stationary gear and the beveled gear-wheel D into or out of gear, substantially as shown and described.

2. In a gearing for the purpose herein described, the combination with a support, of a

shaft or mandrel which passes therethrough, a cone-pulley mounted on said shaft or mandrel and provided with an internal beveled gear B, a beveled gear-wheel D connected with said shaft or mandrel, and supported at an angle thereto and adapted to operate in connection with the beveled gear B on the pulley; said beveled gear-wheel D being provided on its inner surface with a beveled pinion, a beveled gear-wheel M keyed to the shaft or mandrel and adapted to operate in connection with the pinion on the gear-wheel D, a stationary gear secured to the support adjacent to the wheel M and adapted to operate in connection with the beveled gear-wheel D, and means for separating and connecting the stationary gear and the wheel D, substantially as shown and described.

3. In a gearing for the purpose described, a support, a shaft or mandrel passing therethrough, a cone-pulley mounted on said support and provided with an internal beveled gear B, a gear-wheel M keyed to the shaft or mandrel, a beveled gear-wheel D supported between the pinion B and the gear-wheel M, at an angle to the shaft or mandrel and connected therewith, said beveled gear-wheel D being provided on its inner side with a beveled pinion, and being adapted to operate in connection with the beveled pinion B, the beveled pinion on the gear-wheel D being adapted to operate in connection with the gear-wheel M, and a stationary gear connected with the support adjacent to the gear-wheel M and adapted to operate in connection with the beveled gear-wheel D, and means for moving the stationary gear toward or from the gear-wheel D, substantially as shown and described.

4. In a gearing for the purpose herein described, the combination with a support, of a shaft or mandrel which passes therethrough, a beveled gear-wheel connected with said shaft or mandrel and supported at an angle thereto and provided on its inner side with a pinion, a gear-wheel mounted on said shaft or mandrel adjacent to one side of said beveled gear-wheel and operating in connection with said pinion, a circular gear connected with said support adjacent to said last-named gear-wheel and adapted to operate in connection with said beveled gear-wheel, and means for separating and connecting said circular gear and said beveled gear-wheel, substantially as shown and described.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of the subscribing witnesses, this 30th day of November, 1897.

THOMAS HUMPAGE.

Witnesses:

MAYO THOMAS EDWARDS,  
GILBERT JOHN WHITE.