

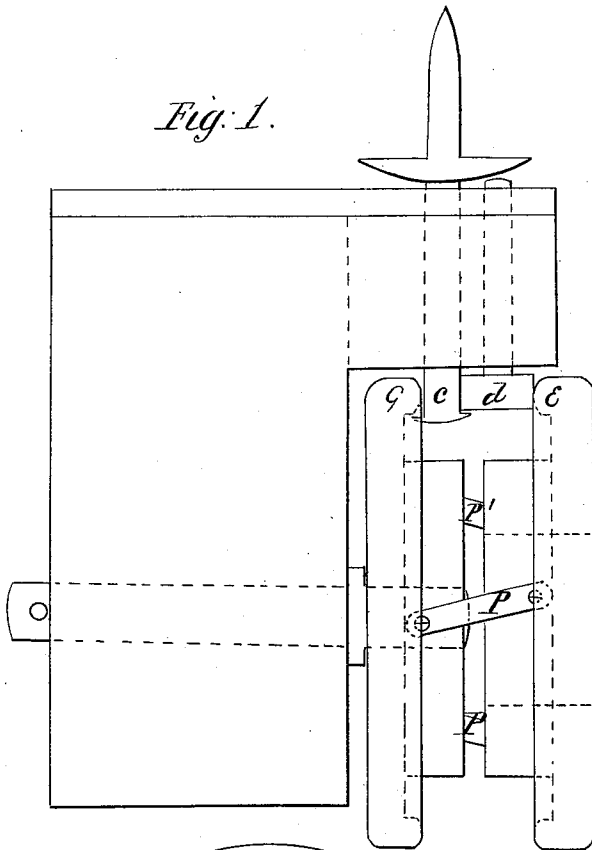
*Hubbard & Smith,*

*Machine Gearing.*

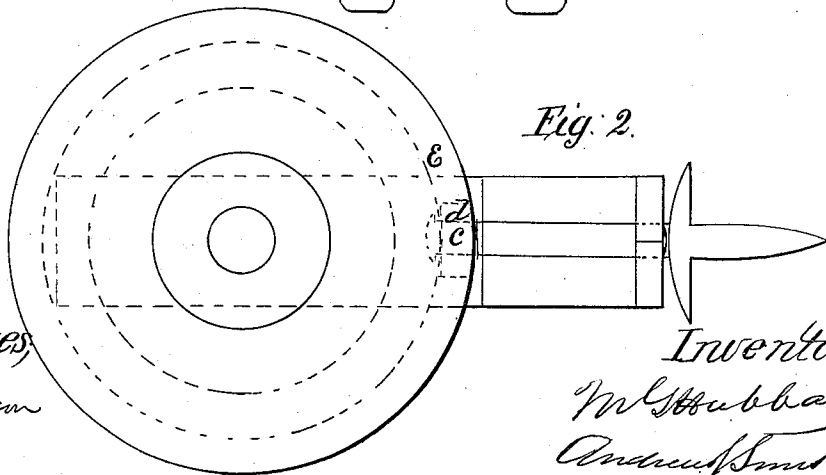
*N<sup>o</sup> 37,757.*

*Patented Feb. 24, 1863.*

*Fig. 1.*



*Fig. 2.*



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# UNITED STATES PATENT OFFICE.

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## IMPROVEMENT IN DRIVING-POWERS FOR SPINNERS.

Specification forming part of Letters Patent No. 37,757, dated February 24, 1863.

*To all whom it may concern:*

Be it known that we, MOSES G. HUBBARD and ANDREW J. SMITH, of the city of Syracuse, in the State of New York, have invented certain new and useful Improvements in Driving-Powers for Spinners, &c.; and we do hereby declare and ascertain the same as follows, reference being had to the accompanying drawings, for illustrating the same.

As the "driving-wheel" in our improved apparatus may revolve in a horizontal or any other plane, as may be most convenient, we will, for the purpose of rendering our description more readily understood, describe it as being in a horizontal position. In this position Figure 1 represents a side view. Fig. 2 represents a top view.

The principal object of our invention is to obtain a self-adjusting pressure upon the speeded shaft or spindle C, so that whatever degree of twist is being given to the yarn, or whatever may be the resistance, the pressure of the driving-rims G and E and driving-roller *d* will at all times bear a proper proportion to the resistance to drive the spindle C with sufficient certainty. One of these driving-surfaces being on one side of the spindle or shaft C, and moving in one direction, while the other driving-surface (being driving-roller *d*) is on the other side of the spindle or shaft C, and moving in a direction opposite to the direction in which the first-named driving-surface is moving, causes the spindle or shaft C to revolve, just as a pencil will revolve when pressed between the two hands, and the hands moved in opposite directions; but the nature of our discovery or invention consists in causing the pressure of the driving-surfaces to increase or diminish in proportion to the resistance of the spindle or speeded shaft C. When we have once discovered and demonstrated practically that this can be done, the ways which may be adopted for applying our invention are so numerous that we will only allude to a few by way of illustrating more fully and plainly the nature of our invention.

For several styles of spinners, and other light and highly-speeded machinery, we prefer to construct the driving-wheel as illustrated in Figs. 1 and 2, which is composed of two rims, (marked G and E in Fig. 1, which is a side view, and in Fig. 2, E is a top view, of one of these rims.) These two rims may be sus-

ended on a main shaft in any convenient manner, so that at least one of them will be free to move toward the other. These two rims are connected by three or more short parallel bars, P P' P<sup>2</sup>, extending from one to the other, one end of each of these parallel bars being hinged or pivoted to one of these rims, and its opposite end is hinged or pivoted to the other rim, so that the two rims are thus connected by the parallel bars in a manner similar to a parallel rule. Between the two rims G and E we locate the driving-roller *d* and the spindle or shaft C to be speeded.

If the rim G is located permanently on the main shaft, the driving-roller *d* and the spindle C should be free vertically, which may be effected by oblong journal-bearings, or ordinary sliding journal-boxes, so that the spindle may be free to be pressed down against the rim G, and the driving-roller *d* may be pressed down against the spindle C by the rim E.

Now, if the power be applied to the main shaft or to the rim G, so as to cause said rim G to revolve, the resistance of spindle C will at first cause the rim G to slip on the under side of spindle C until the advancing movement of rim G by means of the bars P P' P<sup>2</sup> draws the rim E down with increased force against the roller *d*, and the roller *d*, being free, is thus forced down against the upper side of spindle C, and thus the spindle C is drawn down against the rim G with sufficient force to prevent it from slipping. Thus by the action of the said resistance of spindle C and the driving-power operating together the rim E would be drawn down toward the rim G, and the driving-roller *d* would thus be pressed down against the spindle C, and at the same time would press the spindle C, down against the rim G; or, in other words, all of the driving-surfaces would thus be pressed together with a force proportioned to the resistance of spindle C. The proportion which this pressure would bear to the resistance of spindle C would depend upon the angle of the bars P P' P<sup>2</sup>, and this angle should depend upon the material of which the driving-surfaces are made. If iron is used for the driving-surfaces, a pressure of four pounds on the driving-surface will overcome a resistance of one pound, so that the bars P P' P<sup>2</sup> should stand at an angle of four to one; or, in other words, they should extend across from one rim to the other on a slant of

about one-fourth of their own length. When this form of driving-wheel is used in a vertical position, it might require a slight elastic force by means of a spring arranged in some convenient manner, so as to lightly press the driving-surfaces together in order to start the bars P P' P<sup>2</sup> into operation; but when this form of drive-wheel is used in a horizontal position (as we have now supposed it to be for the more plain illustration of our invention) the weight of rim E, pressing down upon the driving-roller d, will at all times insure the requisite contact of all the driving-surfaces to bring the connecting-bars P P' P<sup>2</sup> into operation, and after the said connecting-bars begin to operate, the force with which they will pull the driving-surfaces together will be proportioned to the resistance of shaft C.

Our invention may be still further ascertained by supposing the connecting-bars P P' P<sup>2</sup> entirely removed and the rim E connected to the main shaft by spokes having a long hub in their center, and a thread cut in this hub (at about the same angle at which the previously-described "connecting-bars" were located) and a corresponding screw-thread cut on the main shaft, so that the action of the power when applied to the main shaft or rim G would be to draw the rim E toward the rim G by means of said screw. This arrangement would not be quite as perfect in its operation as the previously-described connecting-bars, but would develop the same results, in causing the resistance of spindle C to operate together with the driving-power in producing or

increasing the pressure of the driving surfaces together.

Various other modes may be readily adopted by any ordinary mechanic skilled in constructing such machinery, while our invention is not limited to any one of the many convenient ways in which it may be applied, but consists, principally, in so constructing and arranging the parts as to bring the resistance and driving-power into joint operation in producing the necessary pressure on the driving-surfaces, and making said pressure self-adjusting. Some such arrangement seems desirable for the success of frictional driving where the resistance is variable, as it constantly is in spinning and several other kinds of light machinery, because without it a uniform pressure equal to the requirements of the greatest amount of resistance would be constantly necessary, which would wear out the driving-surfaces so quickly as to render it too expensive to keep in repair.

Having thus fully described our invention, what we claim therein as new and desire to secure by Letters Patent, is—

The construction and arrangement of the parts in such manner as to produce or increase the pressure on the shaft C by its own resistance and the driving-power, operating together, for the purposes substantially as set forth.

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