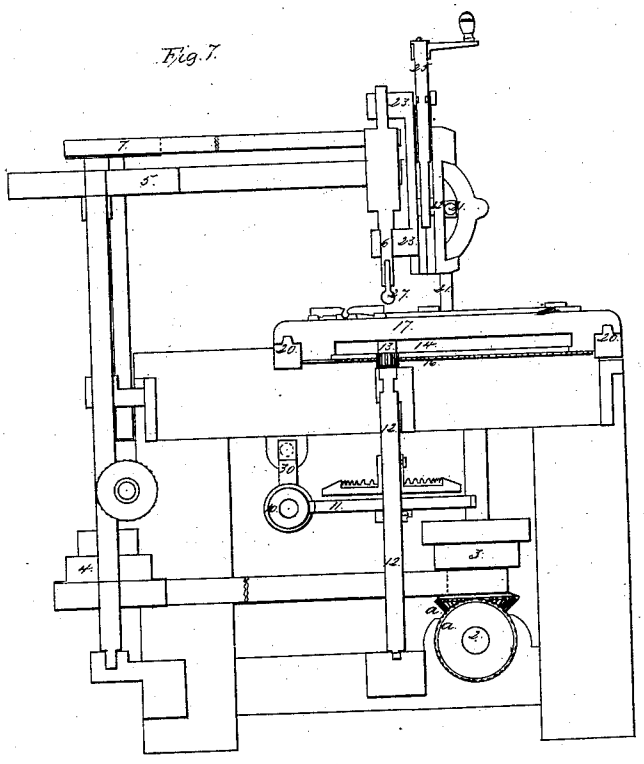
Sheet 1-2 Sheets.

J. S. Brown,

Making Spinning Fliers,

No. 829 Patented July 9, 1838.

Fig. 7.



Sheet 2 - 2 Sheets.

J. S. Brown,

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Fig. 2.

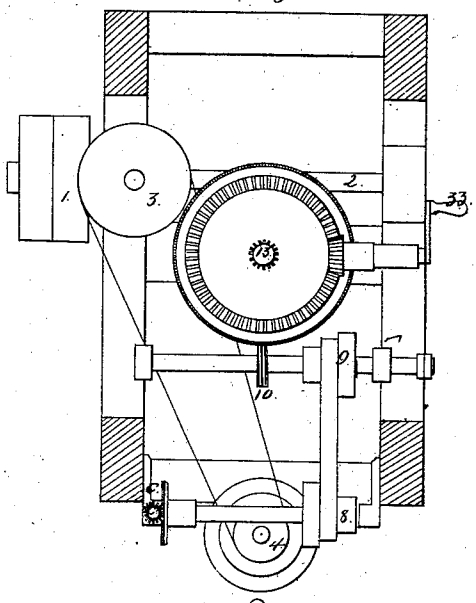


Fig. 6.

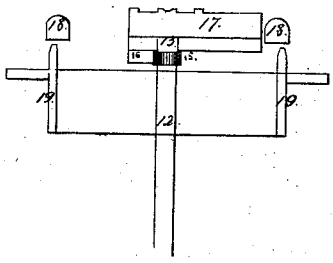


Fig. 5.

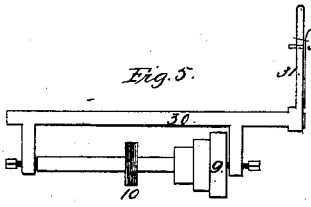


Fig. 1.

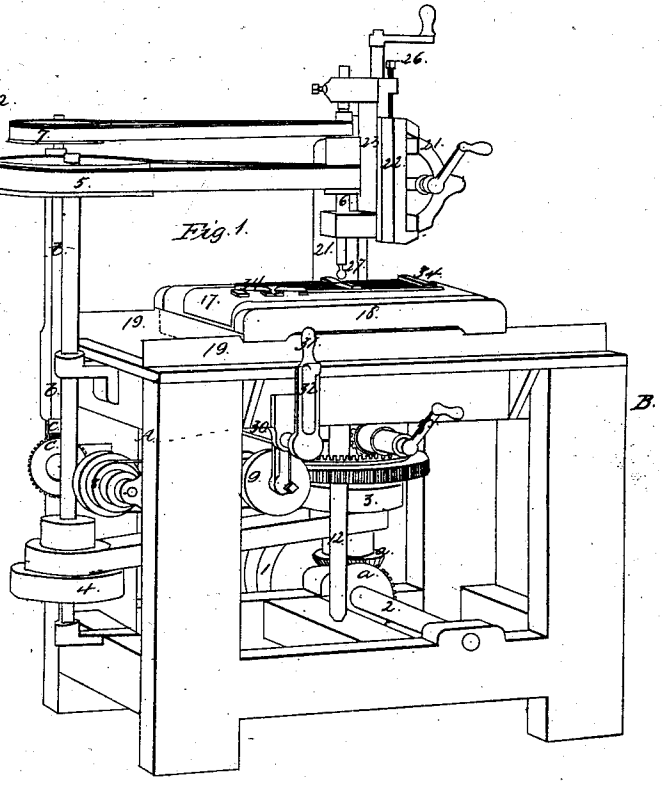


Fig. 4.

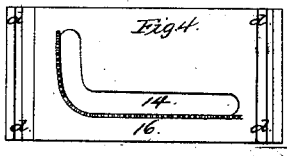
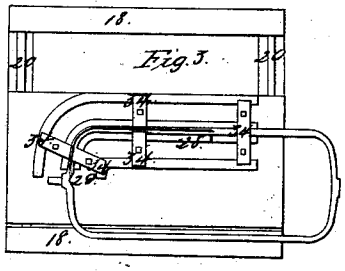


Fig. 3.



UNITED STATES PATENT OFFICE.

JAMES S. BROWN, OF PAWTUCKET, MASSACHUSETTS.

MACHINE FOR FORMING OR CUTTING OUT THE GROOVES ON THE INSIDES OF THE FLIERS OF DOUBLE SPEEDERS.

Specification of Letters Patent No. 829, dated July 9, 1838.

To all whom it may concern:

Be it known that I, JAMES S. BROWN, of Pawtucket, in the county of Bristol and State of Massachusetts, have invented a new and useful Machine for Forming or Boring Out the Grooves on the Inside of Fliers for Double Speeders; and I do hereby declare that the following is a full and exact description thereof.

The design of this machine is to form the groove of the insides of fliers which are cast solid, by means of revolving cutters adapted to that purpose.

In the accompanying drawing Figure 1. is a perspective view of the whole machine, as it appears when in operation. Fig. 2, is a plan of that part which would be seen when the top was removed on the line A, B, Fig. 1. Fig. 3, is a plan of the bed in which the flier is held during the operation of cutting the groove; together with the frame on which the bed rests and moves. Fig. 4, shows the under side of the bed. Fig. 5, is the frame which contains the worm or endless screw, with its appendages, to be presently explained. Fig. 6, is a section of the bed and the frame upon which it rests and slides, showing also the roll and pinion on the top of the center shaft, for giving motion to the bed. Fig. 7, is a vertical section from end to end, and through the center of the machine, the same numbers designating similar parts in all the figures.

The machine may be driven by any suitable power, which is to be applied to the pulley 1, Fig. 1 and 2; this pulley is attached to the horizontal shaft 2, which by means of the bevel gear *a*, *a*, gives motion to a vertical shaft, carrying the coned or graduated pulley 3, which is belted to the coned pulley 4. On the upper end of the vertical shaft of this pulley, there is another marked 5, which is belted to a whirl on arbor 6, in the lower end of which there is a socket for holding the tools by which the groove is to be formed. From the upper end of this arbor (6) a belt is passed to pulley 7, upon the shaft *b*, *b*, on the lower end of this shaft is the bevel gearing *c*, *c*, which carries the horizontal shaft on which are the pulleys 8. From these a belt passes which carries the pulley 9, on the shaft of which is the worm, or endless screw 10, which gears into, and moves the horizontal wheel 11, on the center shaft 12. The shaft 12 extends up to such a height as to enter a groove 14, Fig. 4, on the underside of the bed piece 17. This is shown in the section Fig. 6, where the upper end 13, of the shaft is shown as within the groove 14. A pinion 15, is affixed to this shaft, to operate the bed piece, in a manner to be now explained. The groove 14, is of such width and depth as to receive the upper end of the shaft 12, which may terminate in a friction roller, and is to be made perfectly smooth and true, so as to pass freely along the groove 14, on one edge of this curved groove, and attached to the lower side of the bed, is a toothed rack adapted to the curvature of the groove, which is the same with that of the flier to be grooved. The pinion 15, takes into this toothed rack, and by its revolution moves the bed piece in the direction of the groove. To enable it to do this, there are grooves *d*, *d*, on the underside of the bed piece 17, adapted to tongues, or ways, 20, on the frame 18; and in like manner the frame 18 slides longitudinally on the tongues, or ways 19. The standard 21, which rises from the frame of the machine supports the head stock, with the set-screws, and other appurtenances for carrying and adjusting the cutters.

22 is a slide in which the head stock is held, and is so fitted to the standard as that it may move freely crosswise, by means of the adjusting screw 24.

No. 23 is that part of the head stock in which the arbor 6, is held; it is so fitted as to move freely up and down; and is adjusted by means of the screw 25. The set screw 26 is that by which the height of the head stock is adjusted to the depth of the groove which is to be made in the flier.

The frame 30, which sustains the endless screw 10, is made to swing so far as is necessary to throw it out of gear with the wheel 11; for this purpose a handle 31 is attached to it; 32 being a spring which holds the handle in place when the worm, or endless screw is in gear. When the machine is in operation the flier must be held firmly; this is done by means of clamps marked 34, and shown distinctly in Fig. 3.

The tools which I use for cutting are, first, a straight bit, for cutting the groove to the required depth, and of a width suitable for the opening of the groove; and, secondly, a cherry, 27, or such a tool as is com-

monly used for forming bullet molds. These tools are entered at the side of the flier, at 28, Fig. 3, by bringing the slide 22 forward, by means of the screw 24, until the tool will pass down by the side of the flier, the worm 10, being disengaged from the wheel 11. The machine is put in motion, and the slide is moved gradually back by the screw, until the tool is in the center of the flier. The worm is then engaged with the wheel, and the bed put in motion, until the tool comes out at 29, under the nose of the flier. The bed may be moved back by means of the winch 33, which operates by means of beveled gear, upon the center shaft. To facilitate the forming of the groove it may be cut in the straight part of the flier by means of a common cutter, such as is used for cutting gear, and other purposes.

Having thus fully described the manner in which I construct my machine for cutting the grooves in fliers, and pointed out its mode of operation, I will observe that I do not intend by this description to limit myself to the precise arrangement of the respective parts herein set forth, but to vary these as I may think proper while as a whole, it remains substantially the same.

What I claim as my invention, and desire to secure by Letters Patent being—

The cutting of the groove by revolving cutters, against which the flier is borne and moved by a revolving shaft, guide groove pinion, and curved rack, with the respective parts combined, and operating together, in the manner described.

JAMES S. BROWN.

Witnesses:

ALANSON THAYER,

JAS. O. STARKWEATHER.