

W. REID.  
COP-WINDERS.

No. 179,488.

Patented July 4, 1876.

FIG. 1.

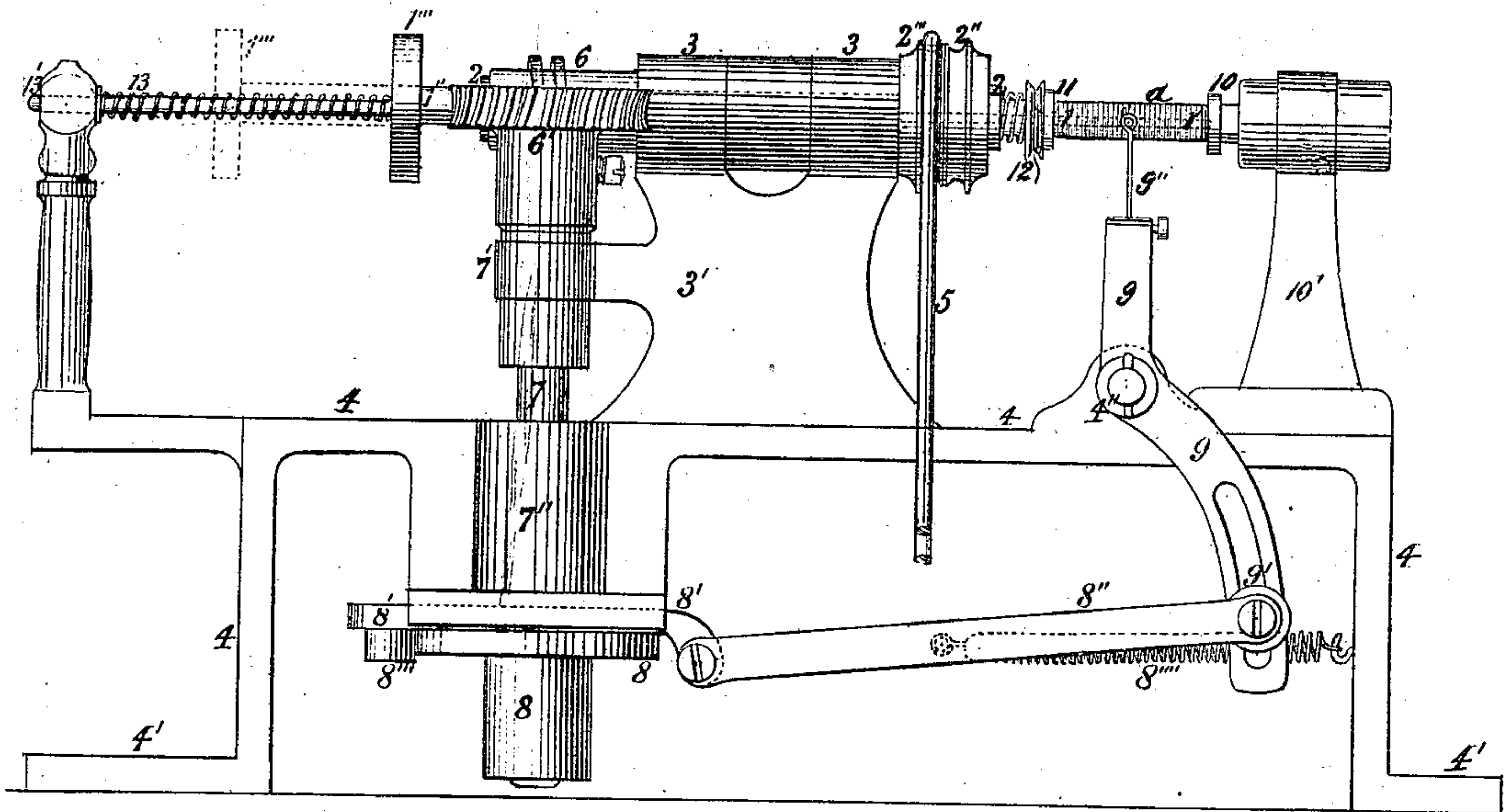


FIG. 3.

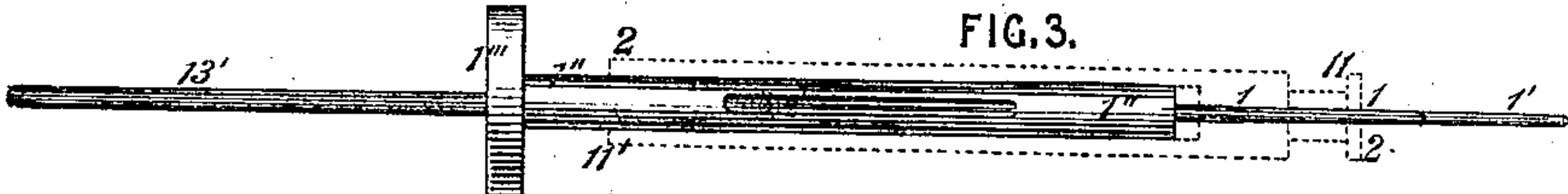


FIG. 5.

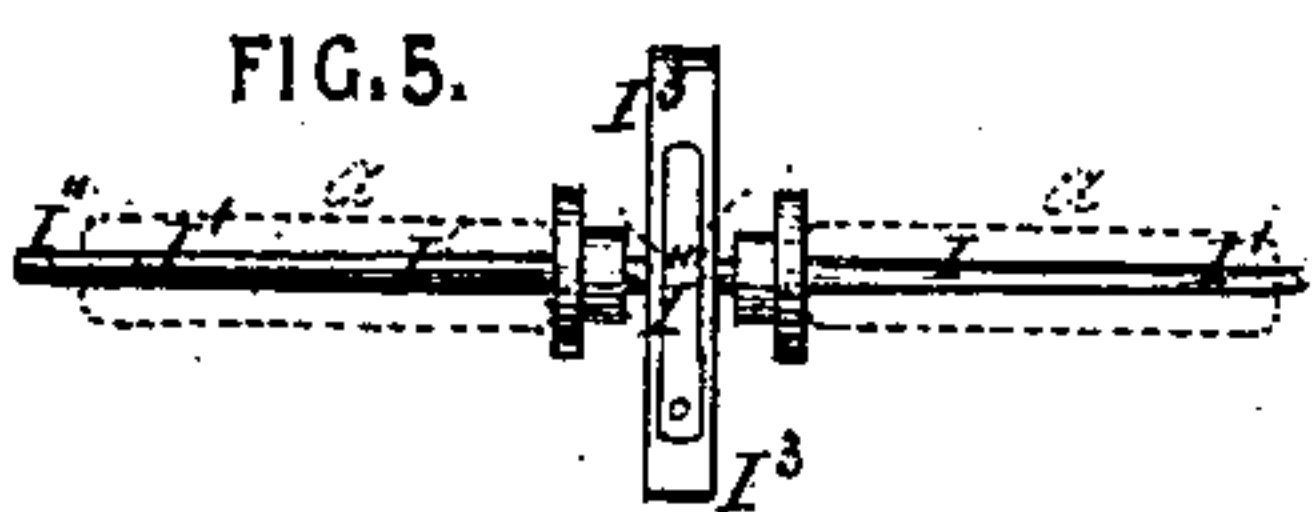


FIG. 4.

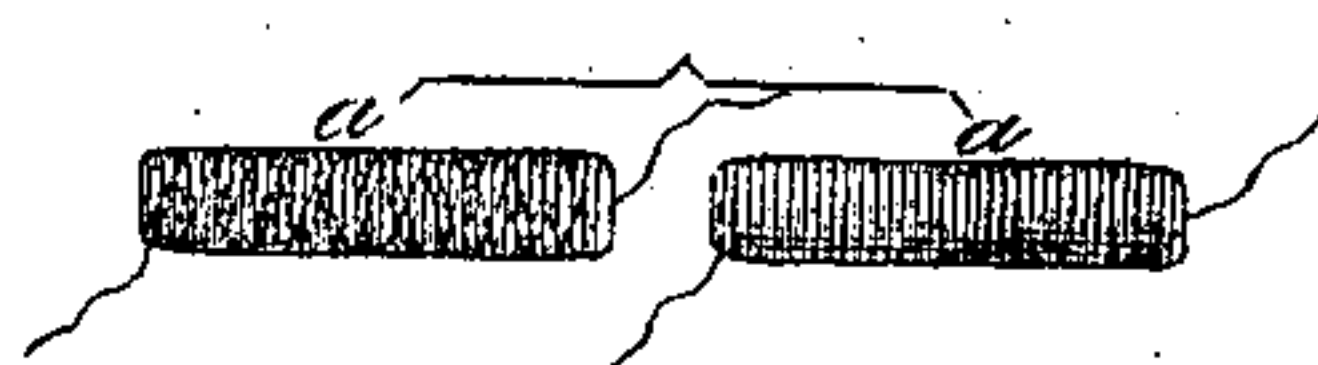
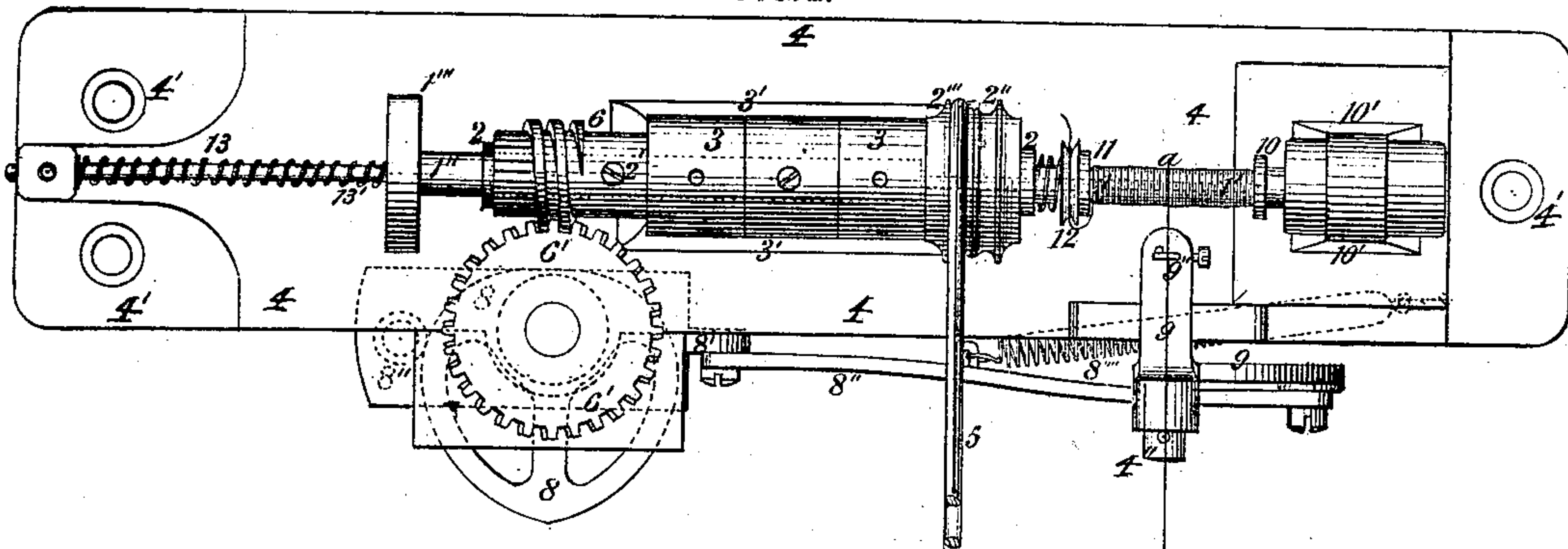


FIG. 2.



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# UNITED STATES PATENT OFFICE.

WILLIAM REID, OF GLASGOW, GREAT BRITAIN.

## IMPROVEMENT IN COP-WINDERS.

Specification forming part of Letters Patent No. 179,488, dated July 4, 1876; application filed April 10, 1876.

*To all whom it may concern:*

Be it known that I, WILLIAM REID, of Glasgow, in the county of Lanark, Great Britain, have invented an Improvement in the Winding of Hollow Cops of Thread for use in shuttles of sewing-machines; and the following is hereby declared to be a full, clear, and exact description of the same.

This invention consists, generally, of a new or improved means of winding the under threads for sewing-machines into the form of hollow cops for use within the shuttles, so that they uncoil or unwind from the inside; and under these improvements far more thread can be put into the shuttle than hitherto, and the stoppages and breakages are greatly reduced thereby; and I do hereby declare that the following is a full and correct description thereof, which will enable others skilled in the art to make and use the same.

Figures 1 and 2 on the accompanying drawings are a front elevation and a plan of a simple single spindle-winding machine, and Fig. 3 is a side view of the cop-winding spindle detached, all for winding the improved hollow cops of thread (one at a time) for use in the shuttles of sewing-machines, and for being unwound from the inside, as shown in side elevation detached in Fig. 4; and all constructed in accordance with, and illustrative of, one mode and means of carrying my said invention into effect or practice.

Referring to these, Figs. 1, 2, and 3, the machine consists of the actual winding-spindle 1, (shown in Fig. 3,) slightly tapered toward the point at the part 1', on which the cop of thread *a*, Fig. 4, is wound. This spindle 1 may either be formed in one with or be secured to the large central part 1'' with the head or collar 1''', by which it is shifted longitudinally within its hollow drawing-spindle 2, which, for that purpose, is connected to the body part 1'' of the spindle 1 by a pin and slot, 2', and mounted to revolve freely in the two journal-bearings 3 of the head-stock 3', formed or secured on the upper part of the frame 4, carrying the whole, and which may be secured, by screws at 4', to a sewing-machine table or other table or frame at a proper height for the attendant to attach the thread and remove the cops *a* as they are finished. The spindle 2 is driven by

a cord, 5, passing from a driving-pulley on the actuating-shaft of the sewing-machine, or other suitable motive-shaft, round the fast or the loose pulley 2'' 2''' mounted on its one end, so as, by its slot-and-pin connection before mentioned, to actuate the spindle in the direction indicated by the arrows in these figures. The spindle 2, by a screw, 6, fast on its one end and working into a screw-wheel, 6', also actuates the vertical spindle 7 carried in the bearings 7' 7'' of the frame 3' and 4, and which, by a heart-cam, 8, keyed on its lower end, actuates the slide 8' working in guides in the lower side of the bearing-bracket 7'', and a connecting-rod, 8'', through the anti-friction pulley 8''' attached to the said slide 7', in one direction, against the power of the spring 8''', which actuates them in the other direction, the one end of the spring being attached to the rod 8'' and the other end to a hook on the end of the stationary frame 4, and the free end of the connecting-rod 8'' is connected by a pin and segmental slot to the pendent arm of the bell-crank 9, fulcrumed on a stud, 4'', projecting from the front of the frame 4, in a transverse plane with the center of the tapered part of the spindle 1, where the cop *a* is wound, and the arm of this crank has the laying-on finger or eye 9'' attached to it, through which the thread is fed from the reel or hank, or from large bobbins or pirns, through tension-regulating spring-disks 9''', or other equivalent, (seen only in Fig. 2,) on its way to the eye 9'' and winding-spindle 1', which lays on the thread regularly from end to end of the tapered part 1' of the spindle 1 1' as the heart-motion 8 actuates it. The conical point of the spindle 1' works in a small recess in the steady-ing collar or bush 10 carried in the standard 10' projecting up from the frame 4, so as to steady it and build the cop *a* with a flat end, the other end of the cop *a* being also built flat close up to the collar 11 on the extreme end of the spindle 2, which has mounted on it, behind the collar, two tension-disks, 12, with a pressing spiral spring at the back as a griper for the end of the thread, which, after being inserted through the eye 9'', is fixed and held between the disks 12, and the cord 5, being shifted on to the fast pulley 2'', (either by hand or by an ordinary hand-lever, not shown in the draw-



ings,) then builds the cop *a*, as shown in Figs. 1 and 2, to the full diameter desired, either in very close spiral rows, as shown at *a*, on the right hand of Fig. 4, or, as preferred, in wider coils, as shown to the left of Fig. 4, which latter makes a firmer and more elastic cop, less liable to be broken in handling while being inserted into the shuttle.

As each cop *a* is so built and finished, the belt 5 is shifted onto the loose pulley 2''', and shown in this position in Figs. 1 and 2, when the tapered part of the spindle 1' is drawn back out of the cop *a* by the drawing-head 1''' against the power of the spring 13, on the small guide-spindle 13' behind it, (to the position indicated in dotted lines in Fig. 1,) by one hand of the operator, so that the cop is then removed by the other hand, when the spring 13 presses back the spindle 1 to its original position, ready for winding another cop, *a*, as hereinbefore described, with the point 1' in the guide-disk 10, all ready for attaching a new thread and winding a fresh cop, *a*.

This new or improved winding machine or mechanism, shown in Figs. 1 and 2 of the accompanying sheet of drawings, for the making of hollow cops of thread for the shuttles of sewing-machines, is described as of the simplest form for winding one cop at a time, and to be attached to each sewing-machine table, or other table suitable for the users or consumers, for winding the cops for one or more machines. But to render these machines suitable for thread-manufactures to wind these improved hollow cops, and supply them to the sewing-machine users ready for insertion into the shuttles, they may be made with a winding-spindle, 1 1', fixed in the spindle 1' or 2, and steadying-center 10, and head-stock or standard 10' at the other or left side, instead of the sliding rod and spindle 13 13', and having a thread-holder and spring, 12, with another bell-crank, 9; and laying-on finger 9'', actuated by the first, or direct from the heart-motion 8 8', so that two cops, *a*, could thus be wound at the same time, thus doubling the production by these alterations, while the cops may be removed automatically by the sliding out of the centers 10 or heads 10', and the fingers and the hand of the operator after drawing back the centers. By the following simple means four such cops may be wound at once on this machine, through the use of duplex or double ended portable

winding-spindle I I' shown in Fig. 5, instead of the fixed spindle 1 1' at each side of the machine, one such, by its square end I'', being inserted in each of the ends 11 11' of the spindles 1 and 2, and there being double bell-cranks 9, and laying-on fingers 9'', in this case at each side, the end of each thread, after passing through the eyes of the latter, would be wound round its respective spindle, and fixed on the holding-spring I''' of the small cross-head I<sup>3</sup>, of and between each pair of spindles I I', when the band 5 would be set on, and a cop, *a*, would be wound on each of these spindles, as indicated in dotted lines in Fig. 5, at both sides of the machine, the portable spindles being removed by the simple pressing back of its steadying-center 10, in this case fitted with a spring behind it for that purpose, when the cops would be removed and the spindles reinserted, and four new cops wound at once, all substantially as stated, and particularly described in reference to, and shown in, Figs. 1 and 2.

The cops *a* can be wound to any length and diameter to suit particular sizes of shuttles, by making the spindles 1 1' or I I' longer or shorter, and a correspondingly longer or shorter traverse be given to the bell-cranks and fingers 9 9'', by shifting the pin in the slot of its lower arm 9', to which the connecting-rod 8'' is attached, and winding for a longer or shorter time, to give a larger or smaller size of cop; and when the cops are built to their full diameter they could be made to set the catch of a spring or weighted lever free to throw the band onto the loose pulley, and stop the winding until the cops were removed and the spindles reset for winding fresh cops.

I claim—

The combination, with a revolving spindle for winding a cylindrical cop, of a holder upon the spindle beyond the portion that receives the cop, substantially as specified, whereby the inner end of the thread is caused to project from the inside of the cop, substantially as set forth.

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