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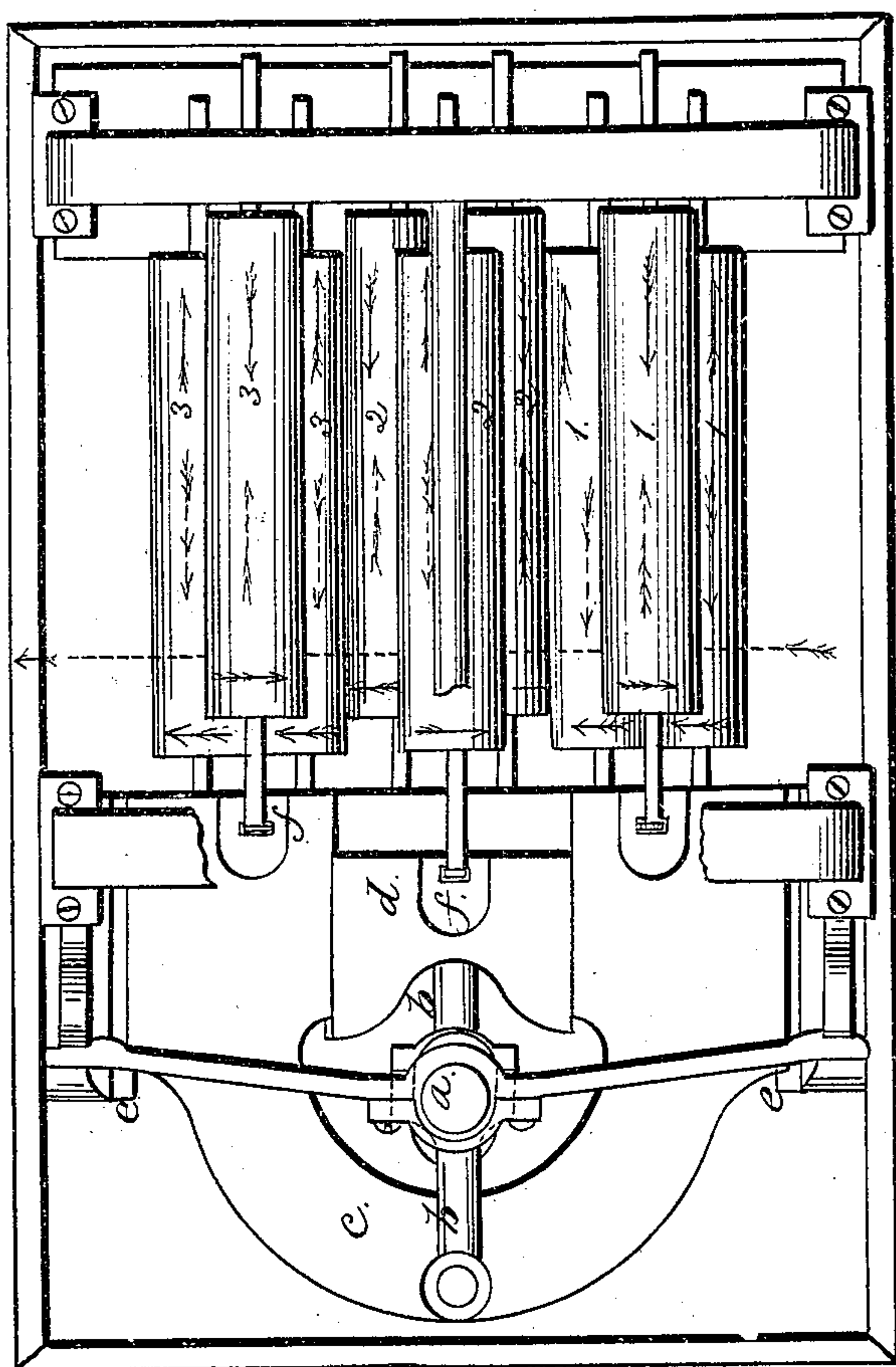
Chase & Stone.

Spinning Drawing Rollers.

N^o 42,076.

Patented Mar. 29, 1864.

Fig. 1.



Witnesses:

P. Gould
J. M. McIntire

Inventor:

Joseph Chase,
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Fig. 3.

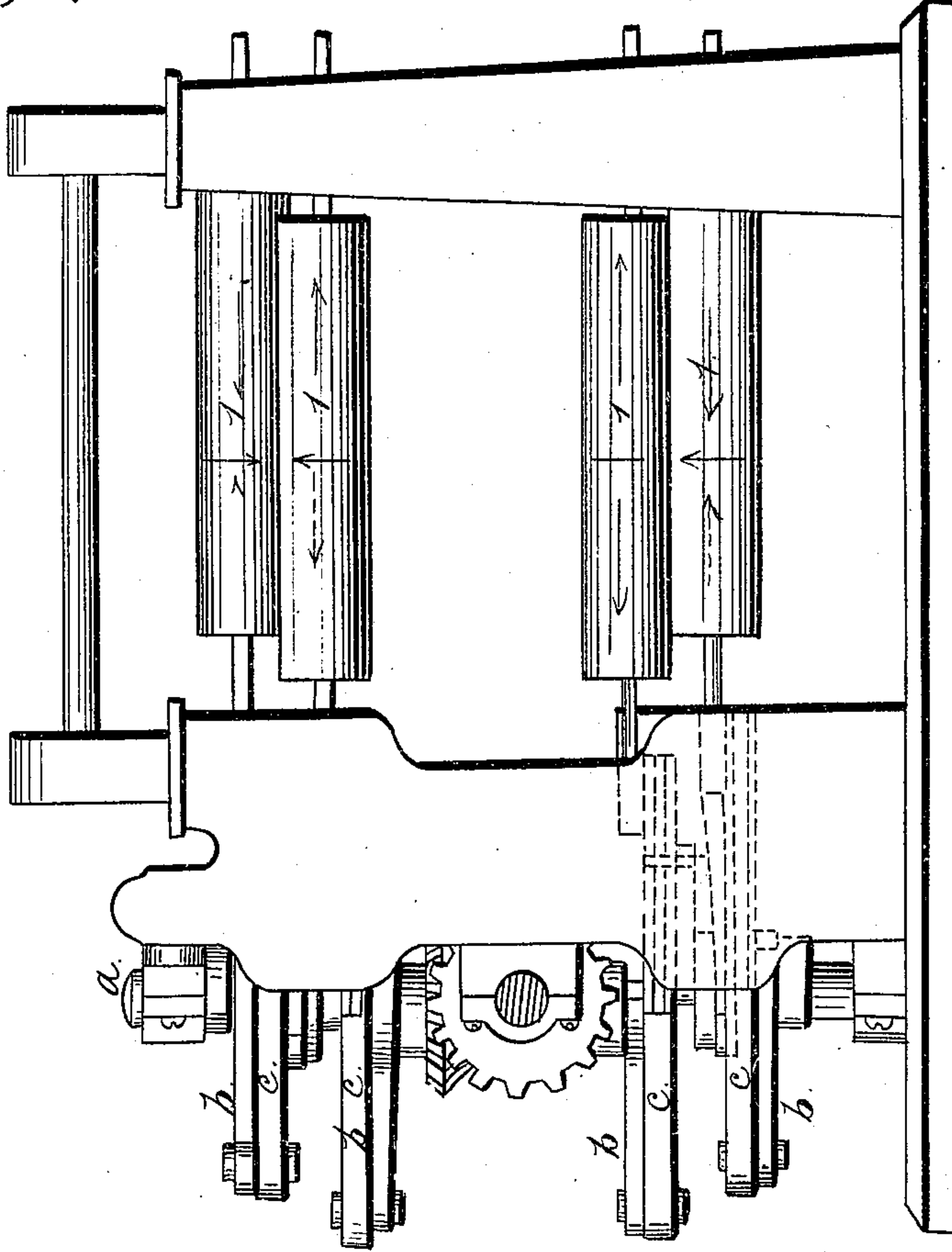
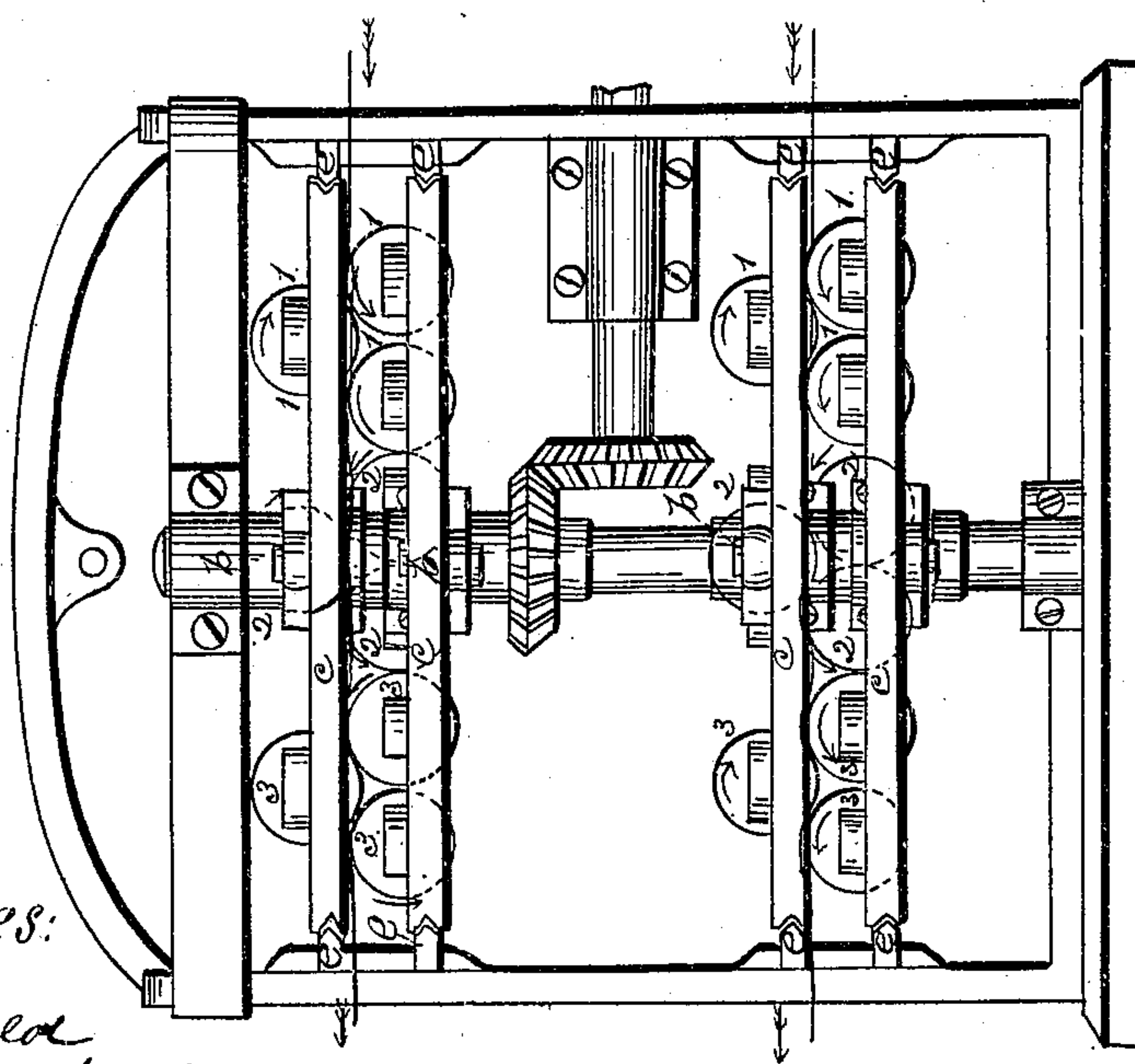


Fig. 2



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F. Gould
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UNITED STATES PATENT OFFICE.

JOSEPH CHASE, OF WORCESTER, AND J. M. STONE, OF NORTH ANDOVER,
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IMPROVEMENT IN THE MODE OF OPERATING THE ROLLS IN DRAWING-FRAMES.

Specification forming part of Letters Patent No. **42,076**, dated March 29, 1864.

To all whom it may concern:

Be it known that we, JOSEPH CHASE, of the city and county of Worcester, in the State of Massachusetts, and J. M. STONE, of North Andover, in the county of Essex and State aforesaid, have invented a new and Improved Manner of Operating the Rolls in Machines for Treating Slivers of Wool, &c.; and we do hereby declare that the following, taken in connection with the drawings which accompany and form part of this specification, is a description of our invention sufficient to enable those skilled in the art to practice it.

Our invention consists in so operating the rolls of a drawing-machine as to temporarily twist together the fibers of the material subjected to their action during the drawing or extending process, by which operation the uniform attenuation of the slivers from the carding-engine is better attained than by the simple rolling, compressing, and drawing action of the ordinary drawing-machine, and by which also the fibers of the slivers are arranged more nearly parallel to each other than heretofore, so that when finally and permanently twisted, the yarn or thread produced is of superior strength and evenness.

In drawing-frames heretofore in use it is well-known that in the series of rolls employed the rolls which discharge the slivers rotate with a considerably greater surface velocity than the rolls at which the slivers are received from the card; also, that these rolls, being arranged in what may be termed "layers," so that the slivers pass between those above and those below, are made to reciprocate, all of the upper layer moving to the right, while the lower layer reciprocate to the left, and vice versa, this movement rotating the slivers first in one direction and then in the other as they are drawn between the upper and under rolls. This rotation, it is probable, aids the compressing and drawing action of the rolls, but does not temporarily increase the strength of the sliver during the drawing process as temporary twisting would do, and the sliver, being weak, with little adhesion between the fibers of which it is composed, is easily broken, and is irregularly attenuated.

In our invention, while retaining the drawing operation of the rolls, they are moved by any suitable mechanism, so that throughout

so much of a sliver as is subjected to the drawing action of the rolls there shall be a twist or torsion, or a series of twists or torsions, first in one direction and then in the other, by which the fibers of the sliver are twisted upon each other temporarily, by which twist the sliver is so strengthened as to enable it to bear more rapid attenuation than heretofore attained in drawing-machines, and with a gain in the uniformity of the product, and with less breakage, while the fibers, by the combined twisting and untwisting and drawing process, are laid more nearly parallel than they are by mere rolling.

In the drawings, Figure 1 represents a plan, Fig. 2 an end elevation, and Fig. 3 a side elevation, of a machine embodying our invention.

We have shown the rolls as arranged in two banks or tiers in a suitable sustaining-frame, the upper tier being intended for action on the slivers discharged from the upper part of a card, and the lower tier on those discharged from the lower part. It will be seen that each tier of rolls is arranged in sets of three, there being an upper roll and two lower rolls in each set, between the bites of which the slivers represented in red lines in Fig. 2 pass in the direction of the indicating-arrows at the ends of said lines.

The arrows upon the rolls indicate the direction of their rotation and of their reciprocations. Of these arrows, which indicate reciprocation, those in solid lines show the reciprocation commencing, while those in dotted lines show the direction of the reciprocation which has terminated. In both the upper and lower tiers are shown three sets of three rolls each, each roll of the first or entrance set being marked 1, each roll of the middle-set 2, and each of the discharge-sets 3. It will now be evident that when the rolls are moved, as indicated, the slivers will be twisted between sets 1 and 2, and between sets 2 and 3, first in one direction, and then untwisted and twisted in the opposite direction, there being an instant when the rolls are in the center of their reciprocations when there is no twist formed in the slivers. It will also be evident that the slivers are discharged without receiving any permanent twist in the machine.

The arrangement and number of rolls may be modified to any extent deemed desirable without departure from our invention so long as in that part of the slivers which are submitted to the drawing or elongating action they are temporarily twisted, first in one direction and then in another, by reciprocations of rolls, or their equivalents—endless belts, for example. Rolls which reciprocate may be intermingled with rolls which only rotate, and these may act as mere carriers; or they may take part in the drawing process; or such rolls may do all the drawing, while the rotating reciprocating rolls act only as carriers and twisters. None of the gearing which rotates the rolls is shown. Any well-known gearing for rotating drawing-frame rolls may be employed. Any suitable mechanism may be used to reciprocate the rolls, that which is shown being as follows: A vertical cranked shaft, *a*, is made to rotate, and its cranks cause motion of connecting-rods *b*, which work slides *c* and *d*, slides *c* reciprocating on ways *e*, secured to the frame-work, and slides *d* re-

ciprocating on ways formed in *e*. The rolls are connected to these slides by necked journals *f* in such a manner that the top rolls of adjacent reciprocating sets of rolls reciprocate in contrary directions, as also do the bottom rolls of such sets.

The arrangement of rolls is not confined to sets of three. Sets of two or any other suitable number will operate well.

We claim—

So arranging and operating the rolls of a drawing or condensing machine that the reciprocating movements of adjacent sets of rolls shall be in alternate directions, substantially as described.

In testimony whereof we have hereunto set our signatures this 23d day of November, A. D. 1863.

JOSEPH CHASE.
J. M. STONE.

Witnesses:

J. B. CROSBY,
F. GOULD.