

No. 703,001.

Patented June 24, 1902.

B. RIETER.

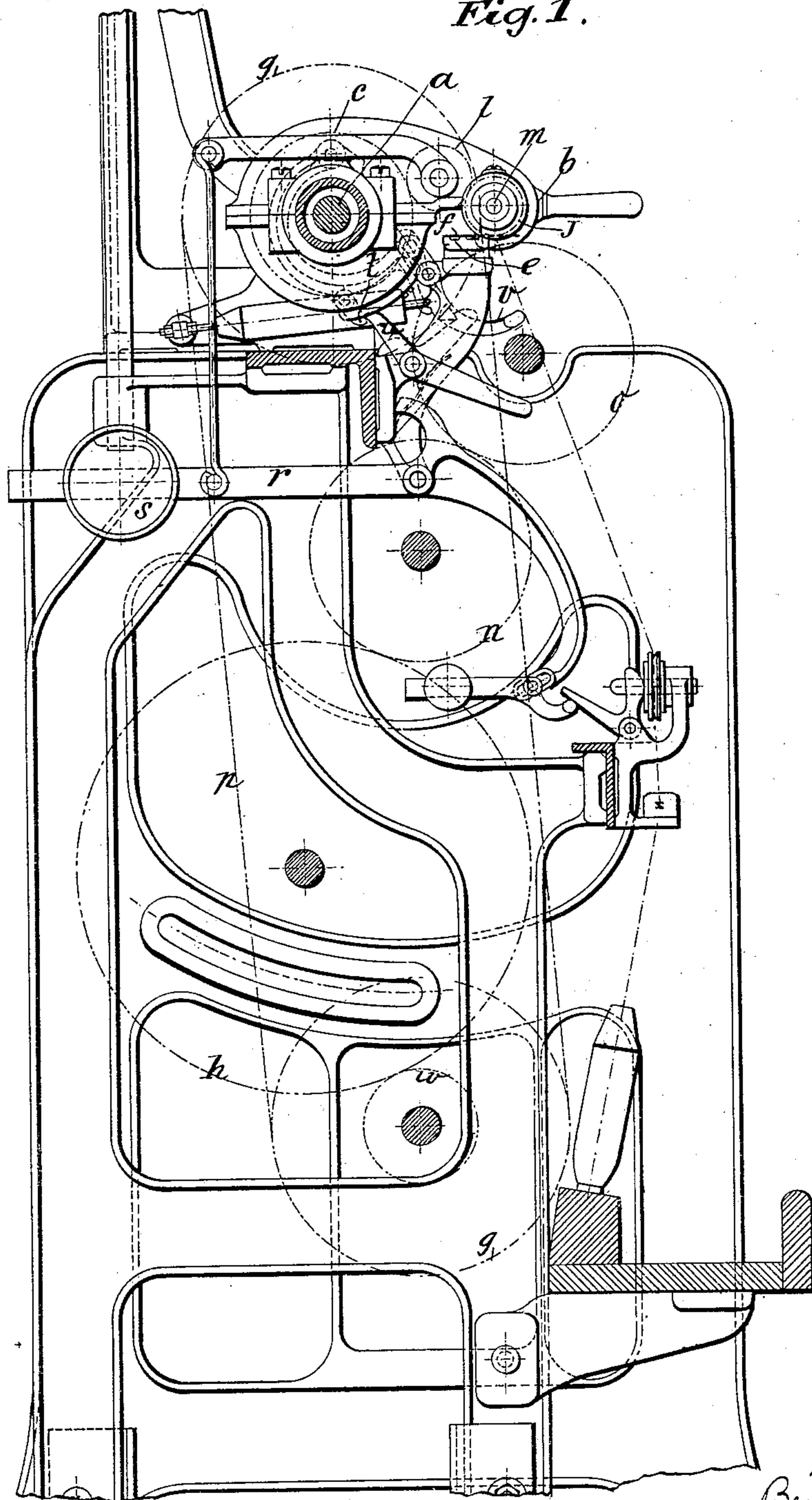
MACHINE FOR CROSS WINDING SPOOLS CLOSED COILED.

(Application filed Apr. 24, 1901.)

(No Model.)

4 Sheets—Sheet 1.

Fig. 1.



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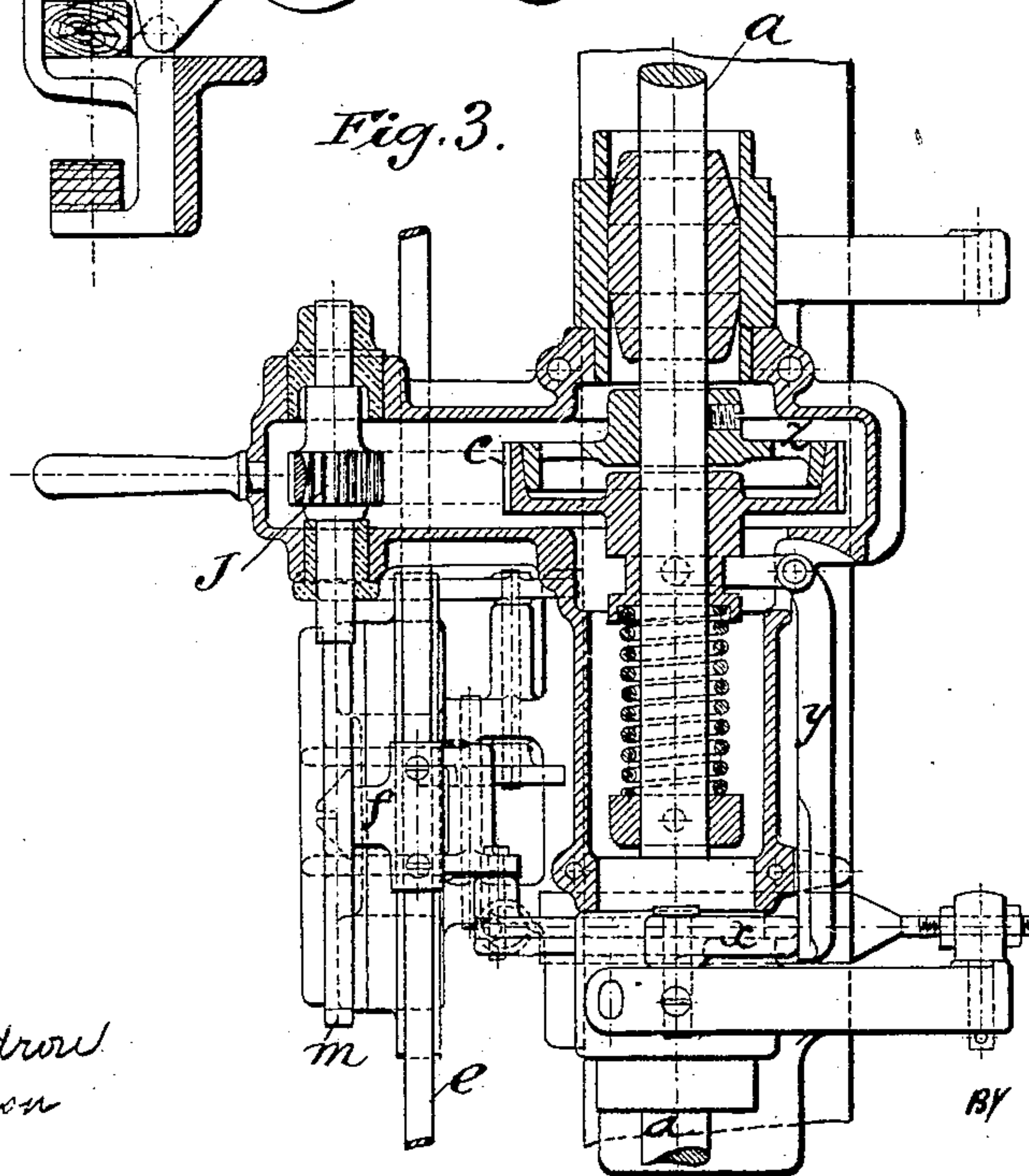
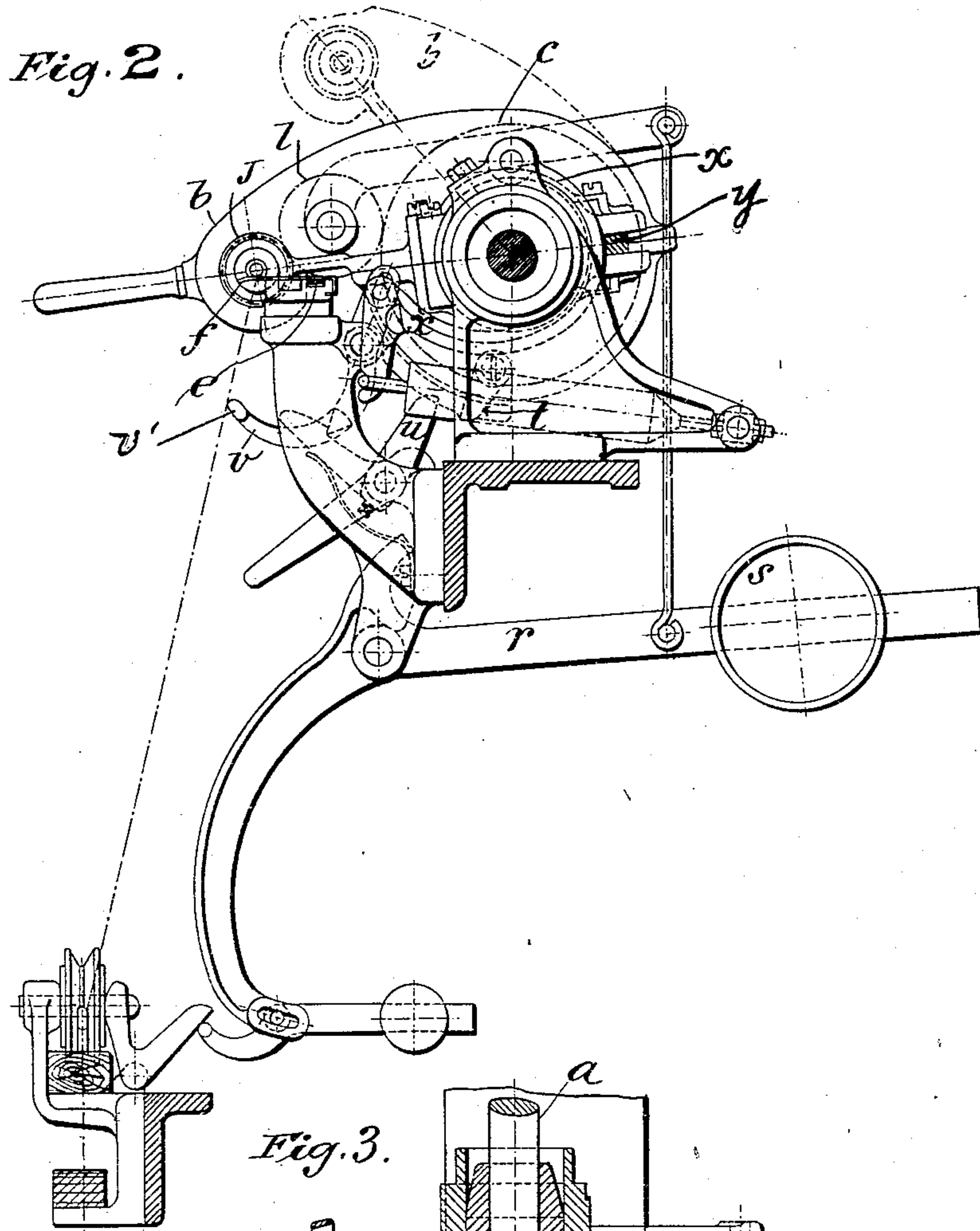
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Fig. 5.

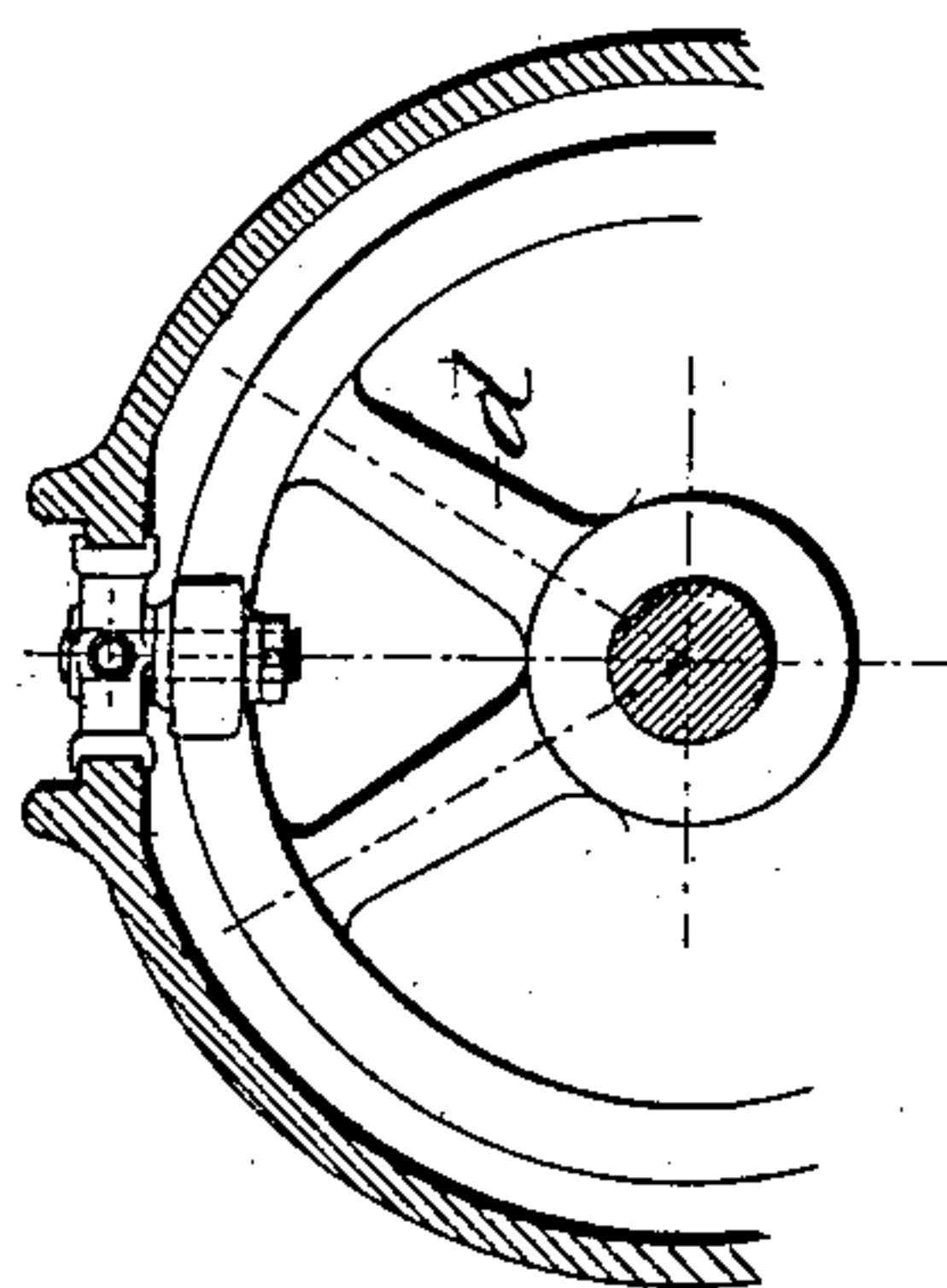
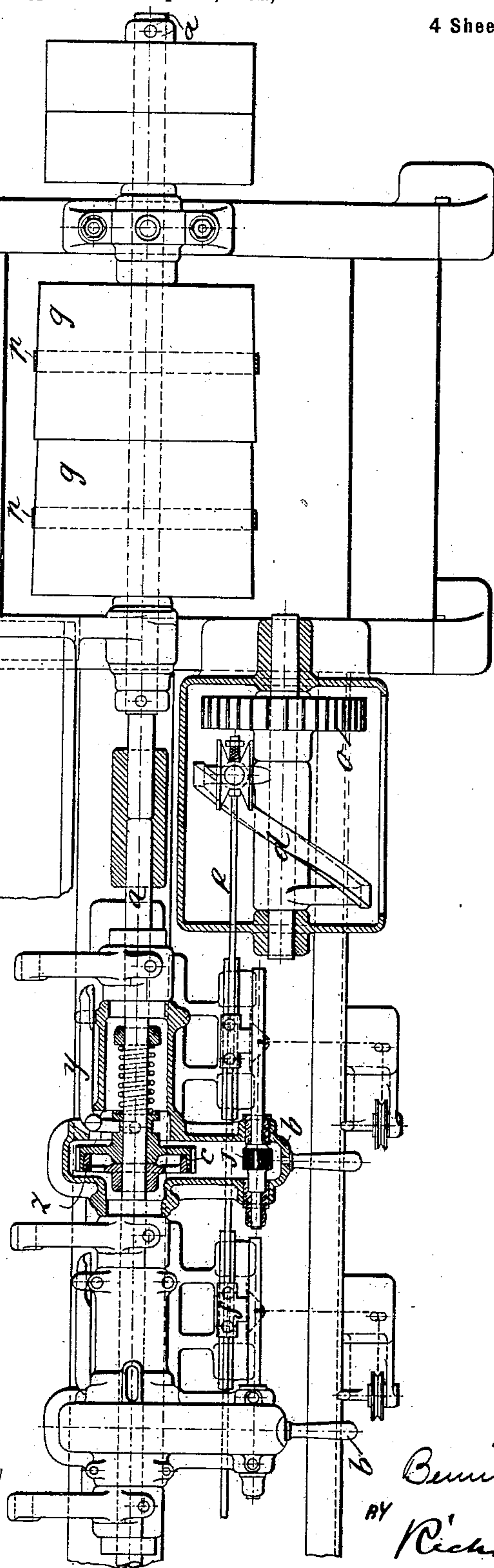


Fig. 4.

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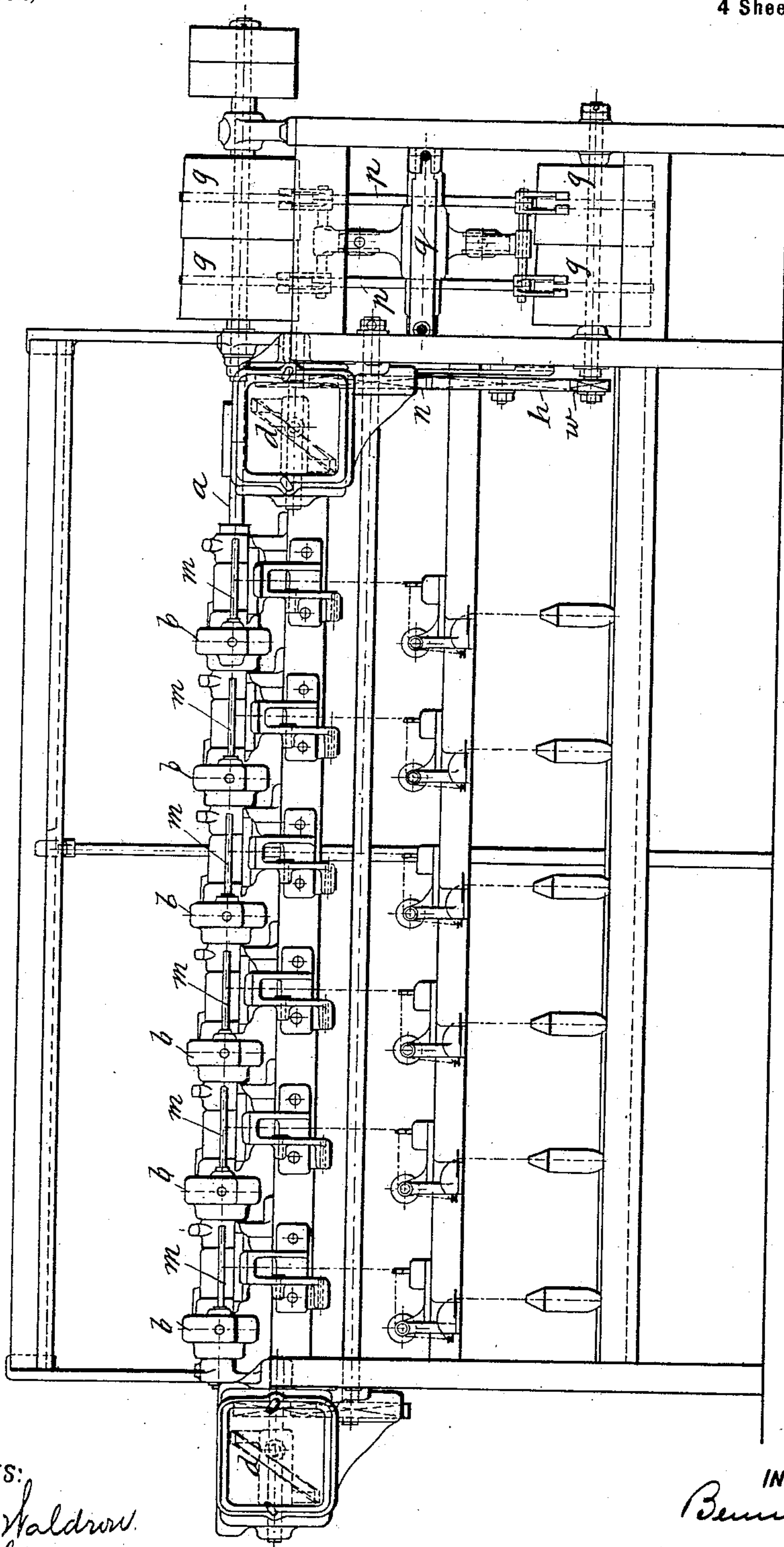
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4 Sheets—Sheet 4.

Fig. 6.



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BENNO RIETER, OF WINTERTHUR, SWITZERLAND.

MACHINE FOR CROSS-WINDING SPOOLS CLOSED-COILED.

SPECIFICATION forming part of Letters Patent No. 703,001, dated June 24, 1902.

Application filed April 24, 1901. Serial No. 57,201. (No model.)

To all whom it may concern:

Be it known that I, BENNO RIETER, of Actiengesellschaft, vormalig Joh. Jacob Rieter and Cie., a citizen of the Republic of Switzerland, residing at Winterthur, Switzerland, whose post-office address is Winterthur, Switzerland, have invented new and useful Improvements in Machines for Cross-Winding Spools Closed-Coiled, (for which I have made application for patents in Switzerland, dated November 12, 1900; in Germany, dated November 30, 1900, and in Great Britain, dated February 28, 1901, No. 4,282,) of which the following is a specification.

My invention relates to improvements in machines for cross-winding spools closed-coiled.

The object of my invention is to mount each winding-spindle and the gearing which turns the same in a lever hinged to the driving-shaft, from which, by means of wheels which can be thrown in and out of gear, the said spindles have motion imparted each separately. Below these levers is arranged a rail carrying all the thread-guides, which rail is positively moved to and fro underneath the said spindles by cams rotated from the driving-shaft by means of strap-cones and change-wheels, so that the speed of the thread-guide rail may be additionally varied, and thus the thread-coils wound closed against each other by changing the position of the strap on the said cones.

It may here be specially remarked that owing to the provisions made for changing the position of the cone-strap to suit various thread thicknesses and the winding-spindles being each mounted in a hinged lever and capable of being thrown out of gear the machine can be run continuously, while a full spool can be removed and a fresh one started without stopping the other spindles, an advantage which no other machine built for a like purpose offers. I attain these objects by the mechanism illustrated in the accompanying four sheets of drawings, in which—

Figure 1 is a vertical end view, partly in section. Figs. 2 and 3 are respectively a vertical section and a sectional plan of certain parts of the machine enlarged; Fig. 4, a sec-

tional end view of the thread-guide rail and cam; Fig. 5, a sectional plan; and Fig. 6, a front view of the machine, partly in section.

Similar letters refer to similar parts throughout the several views.

In carrying out my invention I hinge to the driving-shaft *a*, which rotates at a uniform speed, the hollow levers *b*. In each of these levers is mounted a rotary spindle *m*, upon which the paper tube forming the core of the spool is placed. Upon the shaft *a* is loosely mounted, inside each of the levers *b*, a spur-wheel *c*, which for the purpose of being at certain times coupled with the driving-shaft *a* is adapted to be pressed against a friction-cone *z*, fixed upon the shaft *a*. Rotary motion is transmitted from the spur-wheel *c* to the spur-wheel *J* on the winding-spindle *m* by the spur-pinion *l*, Figs. 2, 3, and 5. By this arrangement the shaft *a* rotates each winding-spindle *m* independently at a uniform speed in any position of the lever *b*.

By means of the lever *r*, furnished with a weight *s*, the weight at the free end of each lever *b* can be so balanced that the winding-spindle is only lightly pressed against the thread-guides *f*, which latter by preference are secured to a rail *e* and mounted underneath the winding-spindles, Figs. 2 and 5. The thread-guides are so formed that the thread will find its own way into the slots thereof. The thread-guide rail is moved to and fro underneath the winding-spindles *m* by the cams *d d*.

The cams *d d* are rotated from the driving-shaft *a* through the slightly-coned strap-pulleys *g g*, one or more pairs of which may be used, according to the power to be transmitted and through the spur-wheels *w*, *h*, *n*, and *o*. The wheel *w* is interchangeable, and its diameter determines the winding, while by changing the position of the strap *p* by means of the strap-fork *q* the variation in the speed of the thread-guide rail *e* necessary to wind the coils closed is obtained.

After setting the machine in motion the thread is wound upon the paper tube of each spindle in right and left screw-thread-like coils, and the lever *b* rises in accordance with the increase in the diameter of the spool. In

so rising and when the spool has reached its desired diameter a projection *t*, Fig. 2, on the lever *b* meets the one arm of an angular lever *v*, which latter then releases the lever *v*, placed under the influence of a spring. This causes the lever *v* to move forward and lift with its widened front end *v'* the thread out of the slot in the thread-guide *f*, while at the same time the back end of the lever *v* moves the curved lever *x*, which then so moves the angular lever *y* that the spur-wheel *c* is brought out of contact with the friction-cone *z*, and thereby the stoppage of the full spindle effected.

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

1. In machines for cross-winding spools, the winding-spindles, a common driving-shaft, a plurality of levers *b* pivotally supported on the common driving-shaft and each carrying one of the spindles, means for driving the common driving-shaft, and a plurality of detachable driving connections between the common driving-shaft and the spindles, said connections being mounted on the said levers, and means for throwing each set of connections out of operation to stop its winding-

spindle independently of the other winding-spindles, substantially as described.

2. In combination, the winding-spindle, a pivoted lever carrying the same, a thread-guide *f* below the spindle and upon which said spindle rests, a driving-shaft upon which the lever is pivoted and detachable driving connections between said shaft and the spindle, said connections being mounted on the lever and controlled by the movement thereof.

3. In combination, a plurality of winding-spindles, a lever for each spindle, a common driving-shaft upon which the levers are pivotally supported, detachable driving connections between the said spindles and shaft, a reciprocating rail, a plurality of thread-guides secured to said rail, a cam at each end of the said rail reciprocating the said rail and means for rotating the said cams jointly at variable speeds, all substantially as described.

In witness whereof I have hereunto set my hand in presence of two witnesses.

BENNO RIETER.

Witnesses:

HANS SPIESS,

A. LIEBERKNECHT.