

2 Sheets—Sheet 1.

MACHINE FOR PREPARING RAMIE, &c.

No. 339,329.

Patented Apr. 6, 1886.

FIG. 1.

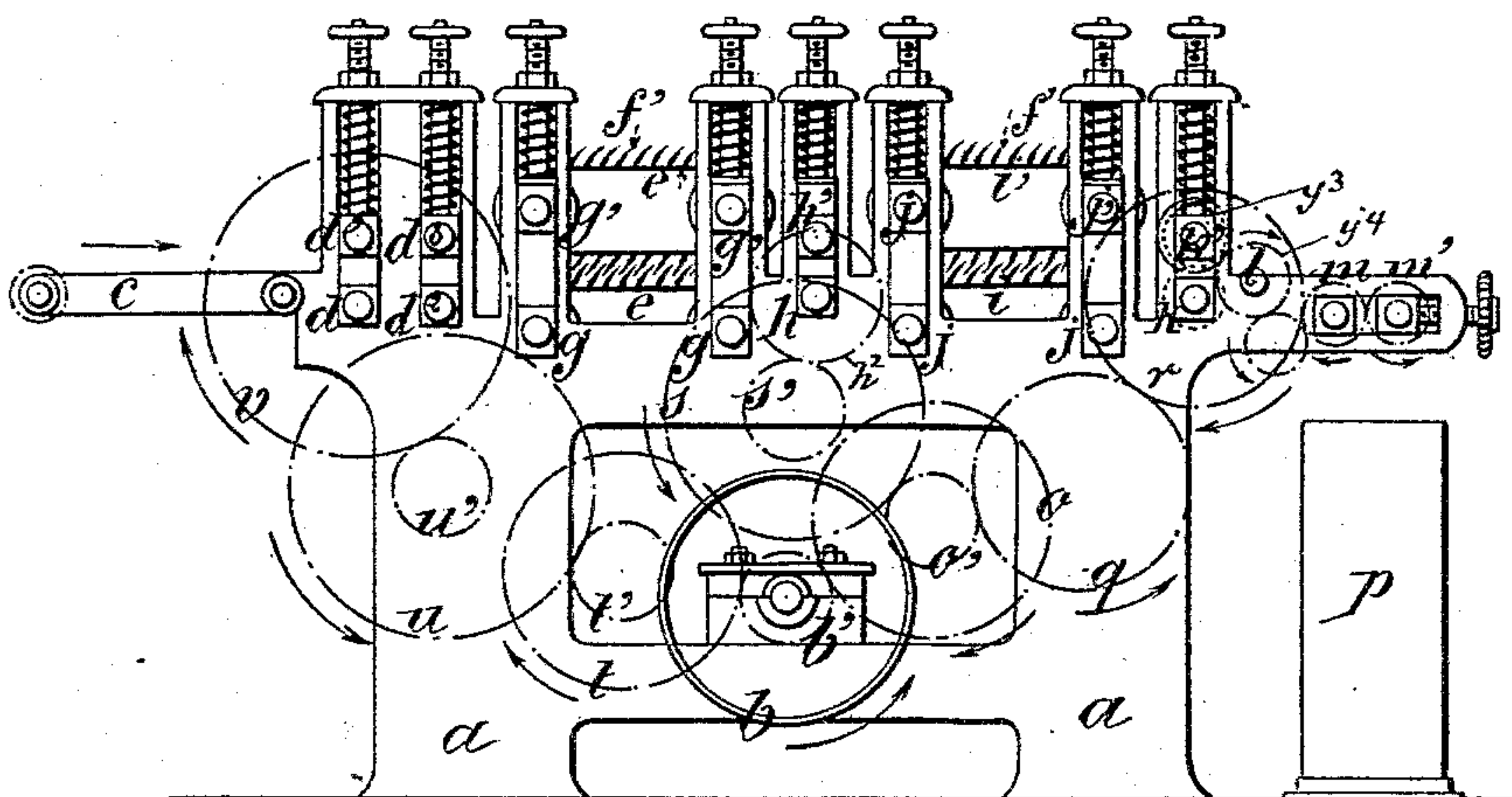
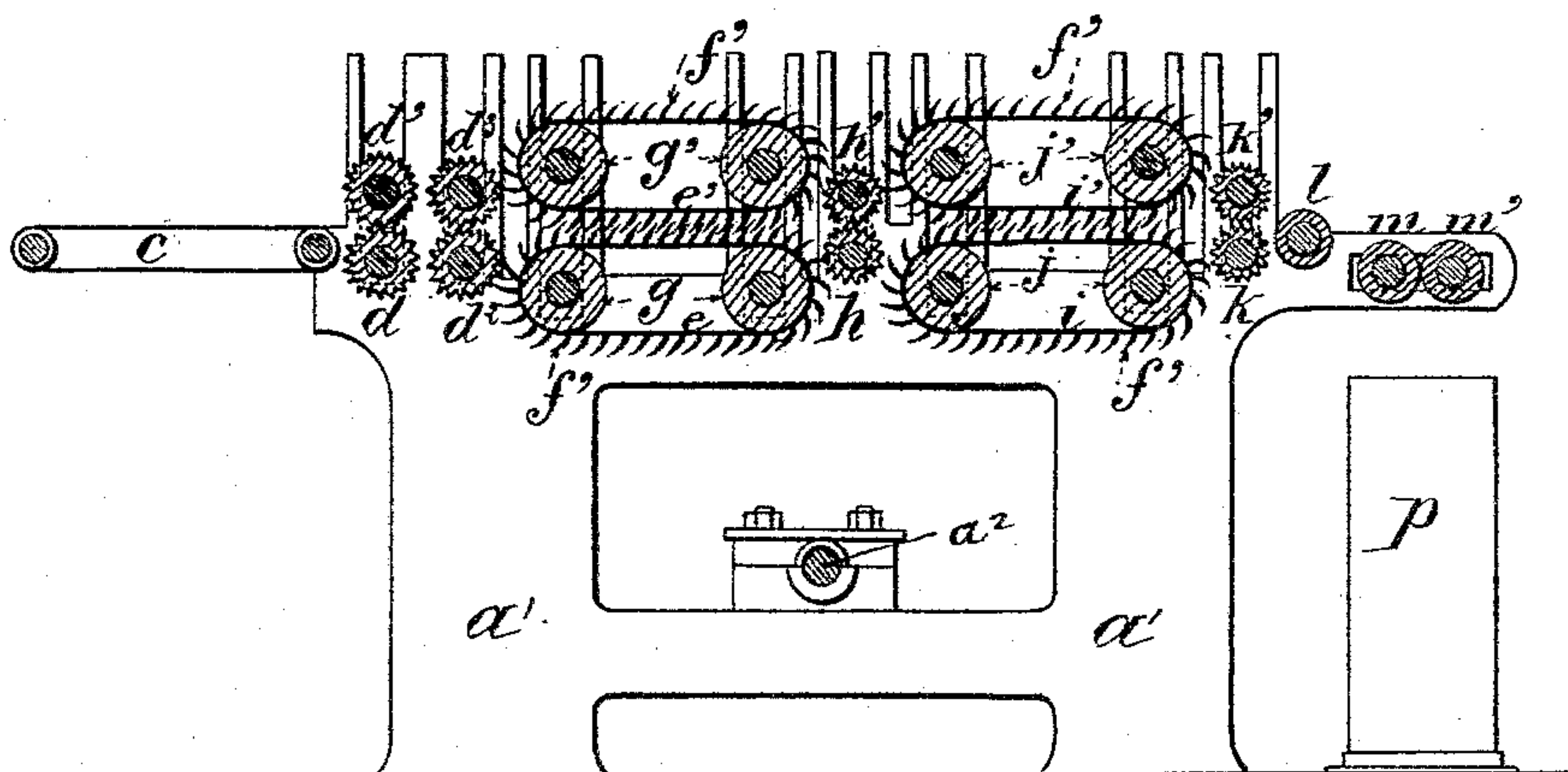


FIG. 2.



Alphonse Bligny

Henry Sanford Bergman.

Theodore Eugene Schipper

(No Model.)

2 Sheets—Sheet 2.

T. E. SCHIEFNER.

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FIG. 3.

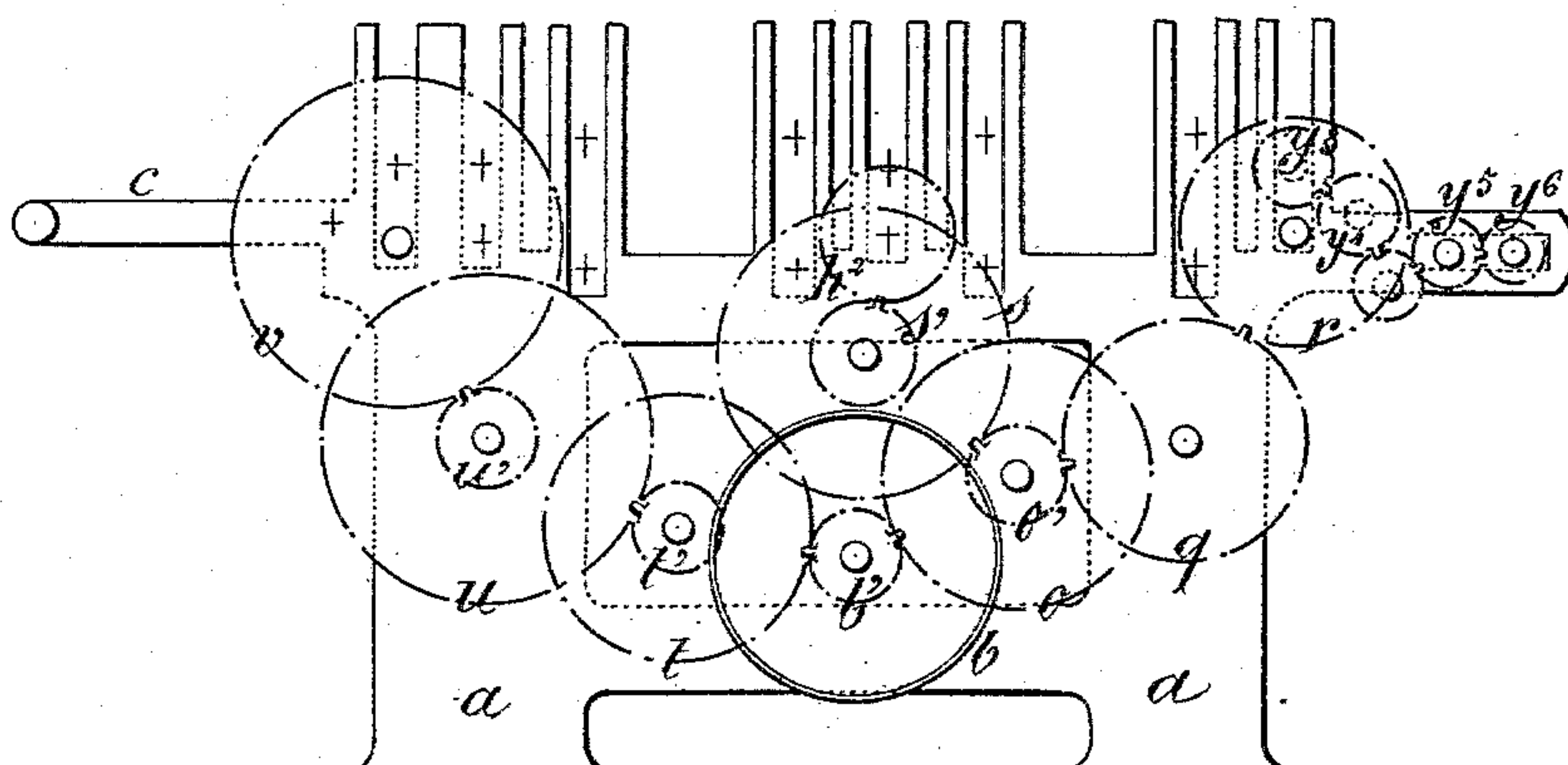


FIG. 4.

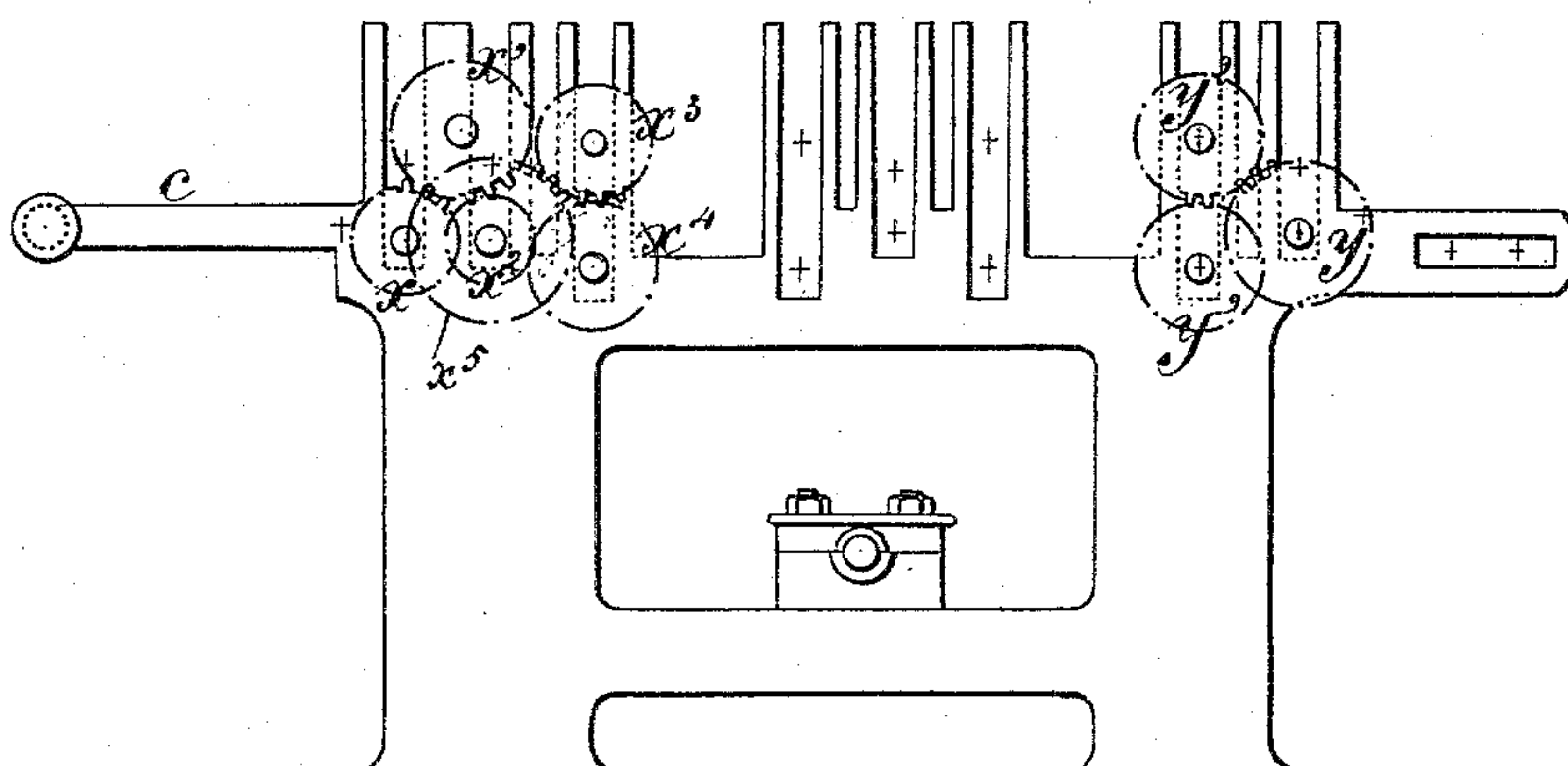
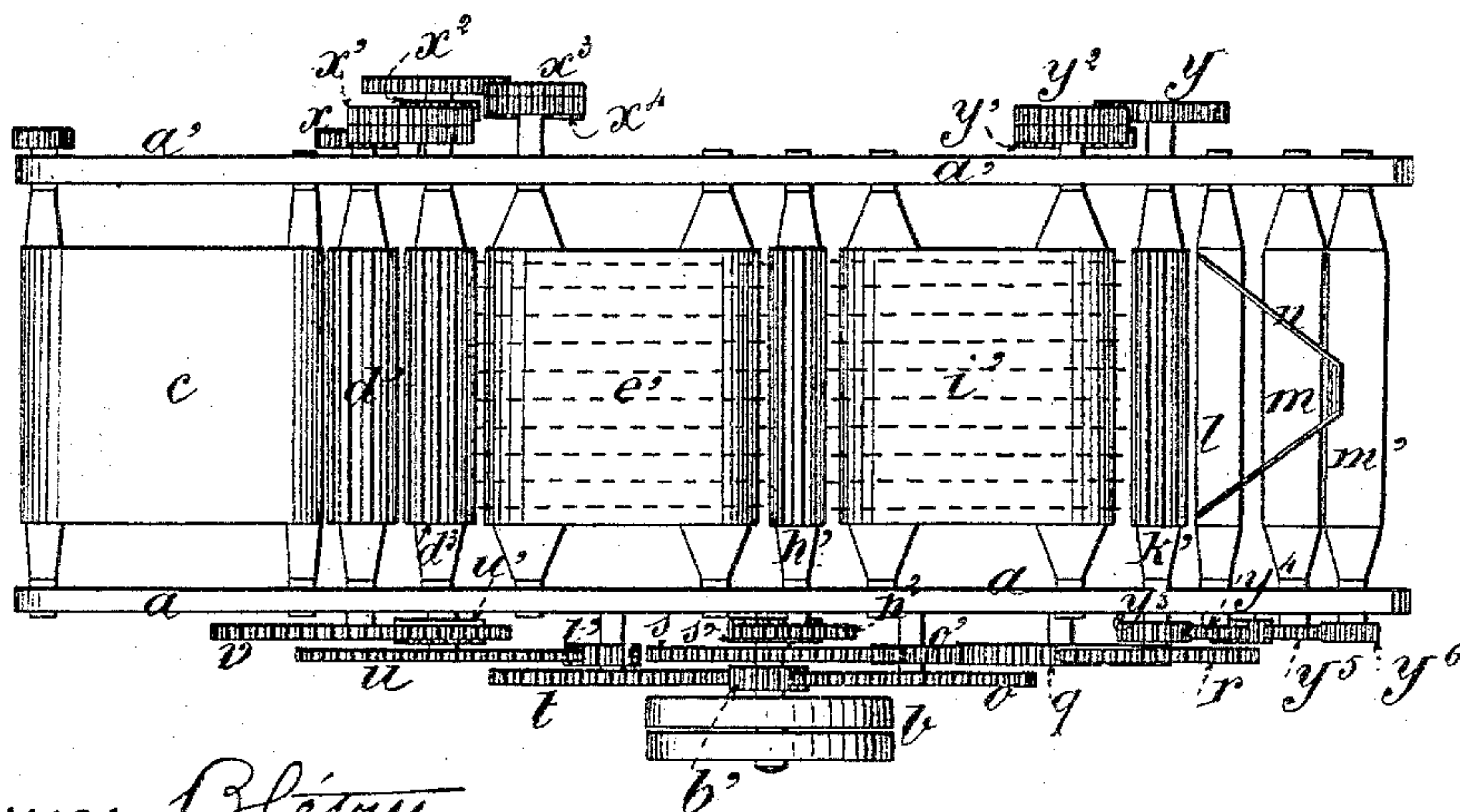


FIG. 5.



Alphonse Blévy

Henry Sanford Bergman.

Theodore Eugene Leifson

UNITED STATES PATENT OFFICE.

THÉODORE EUGÈNE SCHIEFNER, OF ESSONNES, DEPARTMENT OF SEINE-ET-OISE, FRANCE.

MACHINE FOR PREPARING RAMIE, &c.

SPECIFICATION forming part of Letters Patent No. 339,329, dated April 6, 1886.

Application filed September 24, 1885. Serial No. 178,059. (No model.)

To all whom it may concern:

Be it known that I, THÉODORE EUGÈNE SCHIEFNER, of Essonnes, Department of Seine-et-Oise, in the Republic of France, have invented certain new and useful Improvements in Machines for Preparing Rhea or Ramie or other Long-Fibered Substances, of which the following is a specification.

My invention is directed to machinery designed to prepare the fibers of rhea or ramie, nettles, pita, yucca, pine-apple, jute, ananassa, flax, hemp, and other long-fibered materials previous to their being combed and spun into yarn or thread.

Hitherto, so far as I am informed, the work performed by machinery used to prepare ramie and like material for combing and spinning has been in many respects imperfect and unsatisfactory, because the fibers were imperfectly drawn, and were largely undivided, felted, matted together, and knotted, and for this reason were not in fit condition to undergo the subsequent operations requisite for the production of yarn or thread.

It is the object of my invention to obviate these objections, and to obtain a machine by which the material may be drawn, divided, and almost combed without loss, felting, or matting, and may be brought to the condition of a homogeneous sliver composed of parallel fibers.

In the machine in which my improvements are embodied the fiber is first operated on by two pairs of fluted or grooved rolls, by which the material is rendered supple, is flattened and opened, and at the same time is lengthened by a drawing operation. From these rolls it is taken by and between two continuously-moving carding-belts, moving more rapidly than the rolls first named, which serve to draw and lengthen the material, and at the same time to comb it and to deliver it to the mechanism beyond. From these carding-belts it is taken by fluted drawing-rolls, which still further draw and lengthen it. It is thence taken by and between a second pair of carding-belts, which draw, elongate, and comb it, and deliver it to still other drawing-rolls, whence it passes to be condensed in the form of a sliver, which is delivered into a suitable receptacle or can.

In practice, in order to thoroughly prepare the material, I subject it to three successive series of operations, such as above recited, using for this purpose three successive machines, which, while identical in general organization, have their working parts made successively finer. In this way the material can be brought to a condition in which it will be thoroughly prepared for the subsequent combing and spinning operations.

To enable those skilled in the art to understand and use my improvements, I will now proceed to point out the manner in which the same are or may be carried into effect, by reference to the accompanying drawings, in which—

Figure 1 is a side elevation of a machine embodying my invention, the driving-gearing being indicated by broken lines. Fig. 2 is a longitudinal vertical central section of the machine, showing the devices which operate on the fibers. Figs. 3 and 4 are elevations of opposite sides of the frame of the machine, representing diagrammatically the arrangement of the gearing by which the several moving parts of the machine are actuated. Fig. 5 is a plan of the machine.

The parts of the machine which operate on the fiber are as follows, succeeding one another in the order in which they are named: Two pairs of fluted breaking, feeding, and drawing rolls, $d d'$ and $d'' d'''$, a pair of carding-belts, $e e'$, mounted on two pairs of drums or rolls, $g g'$, a pair of fluted conducting and drawing rolls, $h h'$, a second pair of carding-belts, $i i'$, mounted on two pairs of drums or rolls, $j j'$, the final pair of fluted drawing-rolls, $k k'$, and the smooth-surfaced finishing and delivery or discharging rolls $m m'$, to which the fibers are conducted from rolls $k k'$ over a carrier-roll, l , and through a condenser guide or trumpet, n , and from which said fibers pass in the form of a sliver into the can p . The belts are armed with card points or teeth f' , which point in the directions indicated in Fig. 3, and said belts are so actuated that the contiguous faces of each will move in the same direction—that is to say, toward the delivery or discharge end of the machine. The rolls are all mounted in suitable bearings in the frame $a a'$ of the machine, and in such manner that the two rolls

of each pair can be adjusted to and from one another. It is preferred that the bearings of the upper rolls, d' , d^3 , g' , h' , j' , and k' , should be spring-pressed, as indicated in Fig. 1, so that they may automatically yield to variations in thickness of the material under treatment. The rolls d^2 d^3 have a somewhat greater speed of rotation than the rolls d d' , belts e e' move faster than the rolls d^2 d^3 , rolls h h' have a greater speed than the belts e e' , belts i i' move faster than rolls h h' , and the final drawing-rolls k k' have greater speed than the belts i i' . Each set of instrumentalities thus moves at a greater speed than the one which immediately precedes it, and consequently a drawing action takes place between each successive two of the sets.

The gearing by which the parts are thus actuated to move will now be described, it being understood that while the arrangement and proportions about to be stated are well adapted to effectuate the requisite movements of the various parts I do not restrict myself to the same. The driving-shaft is represented at a^2 , provided with the usual fast and loose pulley, b , and having a speed of, say, one hundred and twenty revolutions per minute. On said shaft is a driving-pinion, b' , of forty teeth, from which motion is transmitted to the various parts of the machine. The lower roll, d , of the first pair of rolls, d d' , derives its movement from pinion b' through the intermediate wheels, t , of one hundred and twenty teeth, t' , of forty teeth, u , of one hundred and sixty teeth, and u' , of forty teeth, which last-named wheel engages the wheel v of one hundred and sixty teeth on the roll d . The lower roll, d^2 , of the second pair of rolls, d^2 d^3 , is driven from roll d by a gear, x , of sixty teeth, on said roll d , which, through an intermediate, x' , of eighty teeth, engages and drives the wheel x^2 , of fifty teeth, on roll d^2 . The upper belt, e' , is driven through the agency of the first of the two rolls, g' . This roll g' (see Fig. 4) is driven from roll d^2 by a wheel, x^3 , of one hundred teeth, on said roll d^2 , which engages a wheel, x^3 , of seventy-five teeth, on roll g' . The lower belt, e , is driven at a like speed by the first of its two rolls, g , which is provided with a seventy-five-toothed wheel, x^4 , to engage the corresponding wheel, x^3 . The lower roll, h , of the pair of conducting and drawing rolls h h' , is driven from pinion b' through the intermediary of wheels o , of one hundred and twenty teeth, o' , of fifty teeth, s , of one hundred and thirty-three teeth, s' , of fifty teeth, and h^2 , of seventy-five teeth, the last-named wheel being on roll h . The lower roll, k , of the final pair of drawing-rolls, k k' , takes its movement from pinion b' , through the intermediary of the wheels o , of one hundred and twenty teeth, o' of fifty teeth, q , of eighty teeth, and r , of eighty teeth, the last-named wheel being on roll k . The upper belt, i' , of the second pair of belts, i i' , is moved by the second of its two rolls, j' , said roll being driven from roll k by a sixty-toothed wheel, y , on roll k , which gears with a seventy-five-

toothed wheel, y^2 , on roll j . Said wheel y^2 gears with a corresponding wheel, y' , on the roll j below, and in this way the lower belt, i , is driven. The upper roll, k , imparts motion to the carrier-roll l by means of a fifty-toothed wheel, y^3 , which gears with a corresponding wheel, y^4 , on roll l , and from wheel y^4 motion is transmitted to the gears y^5 y^6 on the finishing and delivery or discharging rolls m m' . From this description of the actuating gearing the movements of the operative parts of the machine relatively to one another can be readily ascertained and determined.

The operation of the machine is as follows: The ramie or other fiber, after bleaching, is placed on the feed-table c , where it is separated and spread in sheet form as evenly as possible. It first passes through and is acted on by the two pairs of rolls d d' and d^2 d^3 . The first pair tend to render it supple and pliable, and flatten and open it. The second pair have measurably the same action, and moving as they do somewhat faster than the first pair, draw and lengthen it, and pass it on to the faster-moving carding-belts e e' , which take it from said rolls d^2 d^3 , and in so doing lengthen and draw it and straighten and comb the fibers. The material carried forward by the carding belts is delivered to the faster-moving conducting and drawing rolls h h' , which draw it and lead it to a position where it is taken by the second pair of belts, i i' , which act upon it in the same manner as the first pair of belts and deliver it to the more rapidly-moving final drawing-rolls, k k' , which also lengthen and draw it. From these rolls it passes over the carrier-roll l and through the trumpet or condenser n , by which it is brought to the form of a sliver, and thence passes through the smooth finishing-rolls m m' , which condense the sliver and deliver it to the can p .

As before stated I in practice subject the material to three successive series of operations of the character just described. The result is that the material is well stretched or drawn, divided, separated, and, indeed, almost combed, being at the same time free from felting, matting, and knots, forming a homogeneous sliver whose fibers are smooth and parallel, and this without appreciable loss or waste. After the material is thus prepared it is entirely fitted for the subsequent combing and spinning operations, which preferably are effected by the use of combing and spinning machines of the character set forth in my applications for Letters Patent filed of even date herewith, and bearing serial numbers 178,057, and 178,058, respectively.

Having now particularly described and ascertained the nature of my improvements and the best way known to me of carrying the same into effect, what I claim as new, and of my own invention, is—

1. The combination of the two pairs of fluted or ribbed rolls d d' and d^2 d^3 , moving at different speeds, as described, so as to exercise a

drawing action on the fibers, with the two continuously-moving endless carding-belts *e e'*, having a faster rate of movement than that of the terminal pair of said rolls, and mechanism
5 for imparting appropriate movement to the several parts, substantially as and for the purposes hereinbefore set forth.

2. The combination of the two pairs of carding-belts *e e'* and *i i'*, the intermediate fluted
10 or ribbed conducting and drawing rolls, *h h'*, and mechanism for actuating these parts to move at different speeds relatively to one another, substantially as and for the purposes hereinbefore set forth.

3. The combination, substantially as hereinbefore set forth, of the two pairs of rolls
15 *d d'* and *d² d³*, the two pairs of carding-belts *e e'* and *i i'*, the conducting and drawing rolls *h h'*, located between said pairs of belts, the final drawing rolls, *k k'*, located beyond the
20 second pair of belts, and actuating mechanism, whereby these parts are speeded relatively to one another, substantially as and for the purposes hereinbefore set forth.

THÉODORE EUGÈNE SCHIEFNER.

Witnesses:

HENRY SANFORD BERGMAN,
ALPHONSE BLÉTREY.