

W. Miller. Sheet 2 of 2 Sheets.
Pulp Grinder.
No. 77,829. Patented May 12, 1868.

Fig. 3.

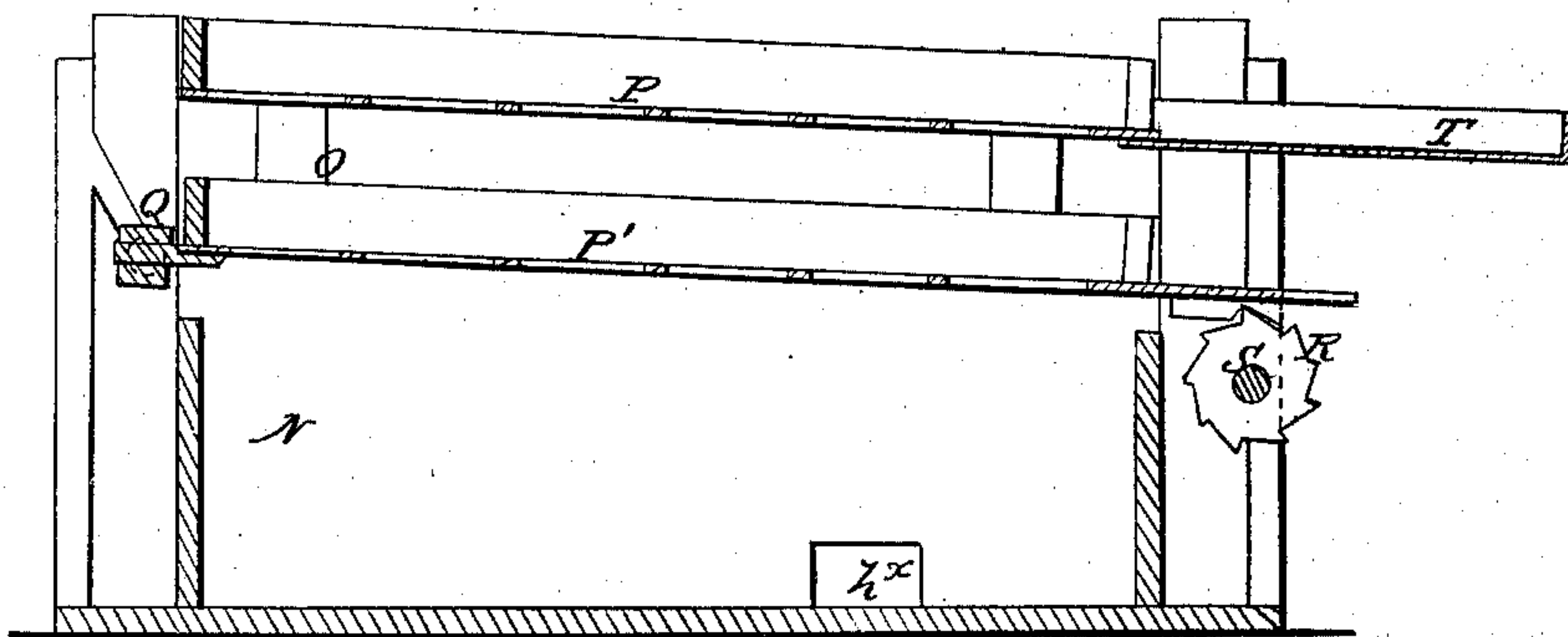
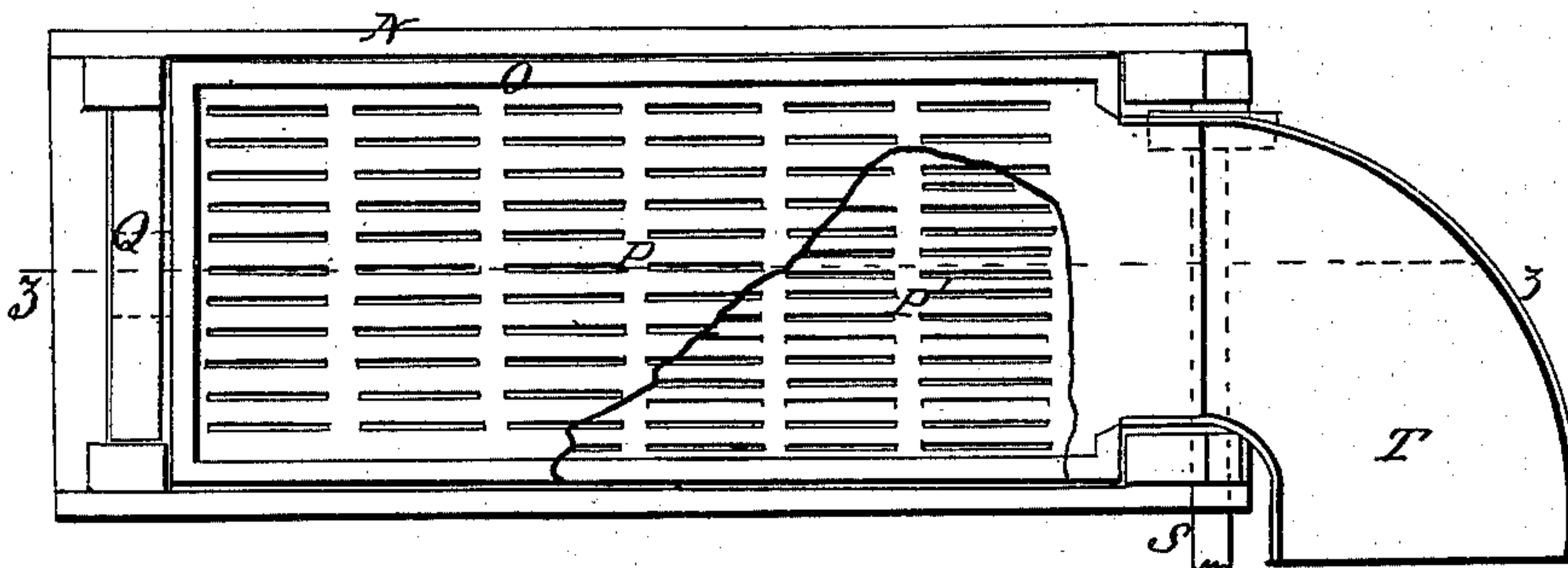


Fig. 4.



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IMPROVEMENT IN MACHINES FOR MAKING PAPER-PULP.

Specification forming part of Letters Patent No. 77,829, dated May 12, 1868.

To all whom it may concern:

Be it known that I, WARNER MILLER, of Herkimer, in the county of Herkimer and State of New York, have invented a new and Improved Machine for Making Paper-Pulp; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

This invention relates to a new and improved apparatus or device for making paper-pulp from wood; and is an improvement on a machine for the purpose for which Letters Patent were granted to H. Marx and F. Marx, dated October 23, 1866.

The present invention relates, first, to an improved mode of operating the followers, whereby the wood to be ground is pressed against the periphery of the stone, a positive mechanical device being used in the original patented machine, whereas I employ springs or weights, arranged and applied as hereinafter set forth, whereby the machine is greatly simplified, and made to operate in a more perfect manner.

The invention relates, second, to an improvement in the screening apparatus, as hereinafter fully shown and described, whereby the pulp is not only deprived of all coarse foreign substances, but also separated or divided into two or more different qualities, with respect to the length and diameter of its fiber, whereas the original machine separated the pulp with respect only to the diameter of its fiber, the different parts thus separated discharged from the machine, as before, at separate points, so that they cannot mingle with each other.

In the accompanying sheet of drawings, Figure 1, Sheet No. 1, is a side sectional view of my invention, taken in the line *x x*, Fig. 2; Fig. 2, a horizontal section of the same, taken in the line *y y*, Fig. 1. Fig. 3, Sheet No. 2, is a side sectional view of the screening apparatus, taken in the line *z z*, Fig. 4; Fig. 4, a plan or top view of the same.

Similar letters of reference indicate corresponding parts.

A represents a box or case, in which the grindstone B is placed, and revolves in a

vertical plane, the greater portion of the upper part of the stone being covered by a detachable cap, C. The box or case and the grindstone may be constructed and arranged substantially as shown in the Letters Patent of the original machine.

The box or case A is constructed with an extension, D, in which two followers, E E', and their concomitant parts, are placed. These followers, in connection with springs or weights, serve to feed the wood under process of grinding to the stone.

The arrangement of the parts by which this end is attained may differ slightly or be modified in different ways, and still be, in a patentable sense, substantially the same, or mechanical equivalents.

The lever-follower E is provided with a rod, F, extending outward and centrally from its back at right angles, and passing loosely through a cross-head, G, and a fixed cross-bar, H, the ends of the cross-bar G being fitted in notches in cleats *a*, attached to the extension. On the rod F, between the cross-head G and the fixed cross-bar H, there is placed a spiral spring, I, which presses the follower in a direction toward the stone, and presses the wood, J, to be ground, against the stone.

The wood J is previously gotten out of the proper dimensions and steamed, so as to facilitate the grinding process, and is placed in front of the follower E, between it and the stone, through a door, *b*, in the side of the extension, the wood and follower resting upon a slightly-inclined plate or bed, *c*.

The strength of the spring I should be such as to press the wood sufficiently hard against the periphery of the stone.

In lieu of a spiral spring, I, a flat spring, K, may be employed, as shown in red in Fig. 1, said spring bearing against the outer end of the rod F, and having its lower end pivoted to a projection, *d*, on the base of the case or box A. By this arrangement the spring K may be turned down out of the way when it is necessary to draw back the follower for the insertion of a piece of wood, and if the spiral spring I be used the follower may be relieved of its pressure, when it is necessary to insert a piece of wood, by turning the cross-head G;

so that its ends will pass out of the notches in the cleats *a*. Either or both of the springs I K may be used, as desired.

A weight and lever may be employed in lieu of springs, and the upper follower, E', is represented as being thus actuated. In this plan the lever L has its fulcrum E at the outer end and upper part of the extension D, the lower end of said lever bearing against the outer end of the follower-rod M, and the upper end having a cord, *f*, attached, which passes over one or more pulleys, with a weight secured to its lower end. The wood to be ground is adjusted between the upper follower, E', and the stone through a door, *g*, in the top of the extension D.

By the means above described—either the springs or the weight—the wood is kept pressed against the stone until entirely ground up, and new pieces may be inserted with the greatest facility.

This improvement greatly simplifies the construction of the machine, materially reducing the cost of its construction, and causing a more uniform or equal pressure of the followers against the wood.

In the original machine complicated gearing is employed, the operation of which is attended with considerable friction, and consequently unreliable in its action, and not so sensitive or yielding in case of any foreign substance being drawn in between the wood and the stone.

I would remark that in my improved machine, as well as in the original, a stream of clean water is poured upon the wood while being ground or acted upon by the stone, the mixture of the ground wood with the water forming a pulp, which passes from the box or case A through an opening, *h*, and is discharged upon a screening apparatus, which is constructed as follows:

N represents a box, of rectangular form, in the upper part of which a shoe, Q, is placed, having within it two screens, P P', placed one above the other, as shown in Fig. 3. This shoe at one end is attached to a rock-shaft, Q, and the opposite end rests upon a ratchet-shaped cam, R, which is upon a shaft, S, that passes transversely through the box N. This cam R, when the shaft S is rotated, gives an up-and-down shake motion to the shoe, the cam raising the shoe by its prominences, the shoe, as each prominence passes it, falling by its own gravity.

The screens, instead of being constructed of wire, (sieves,) as in the original machine, and having a square mesh, are constructed of metal plates perforated with oblong slots, the width of which is equal to the thickness of the fiber designed to pass through it. The stock is thus separated or divided according to the thickness of the fiber, a long fiber being required in all kinds of stock.

The upper screen, P, is coarser than the lower one, P'; and the upper screen, P, has a curved spout or chute, T, attached to it, which discharges all fiber that is too coarse to pass through the upper screen off from one side of the box N. The pulp which passes through the top screen, P, falls upon the lower and finer one, P', and the finer portion of the pulp passes through the lower screen, P', and drops into the lower part of the box N, while the coarser portion of the pulp passes off from the outer or discharge end of the screen P', the finest pulp being discharged through an opening, *h*^x, at one side of the lower part of the box N.

It will be seen from the above description that the two different kinds of pulp are discharged from the screening apparatus at different points, so that the several parts cannot become mixed; and it will also be seen that more than two screens may be used if it is desired to divide the pulp into more than two different kinds of stock.

The pulp is made to flow direct from the box or case A upon the upper screen, P, near the rock-shaft end of the shoe, the latter having a slight inclination, to admit of the pulp flowing by its own gravity, in connection with the shake-motion, over the screens.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The operating of the followers E E', or, in other words, the feeding of the wood to the grindstone, by means of springs or a lever and weight, arranged substantially as herein shown and described, and for the purpose specified.

2. The particular application of the springs I K, as shown, to admit of the followers being relieved of their pressure whenever it is required to withdraw the followers for the insertion of the wood to be ground.

3. The placing of two or more screens, P P', one above the other, in a shoe, Q, placed in a suitable box, N, and having a shake-motion communicated to it by means of a cam, R, or its equivalent, when such device is used in connection with or applied to a machine for making paper-pulp, substantially as set forth.

4. The curved spout or chute T, attached to the upper screen, P, when said spout or chute is used in connection with a shoe containing two or more screens, and all arranged in such a manner as to admit of the dividing or separating of the pulp into two or more kinds or qualities of stock, substantially as set forth.

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Witnesses:

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