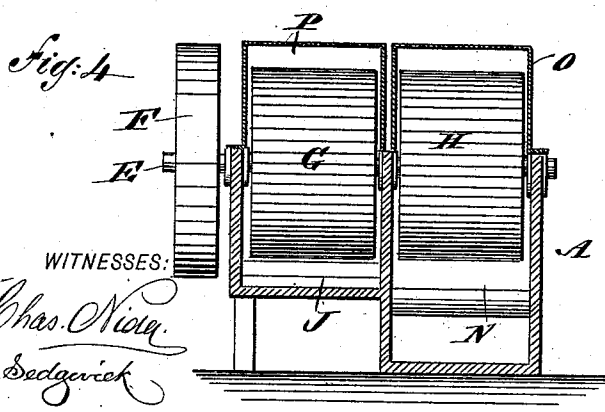
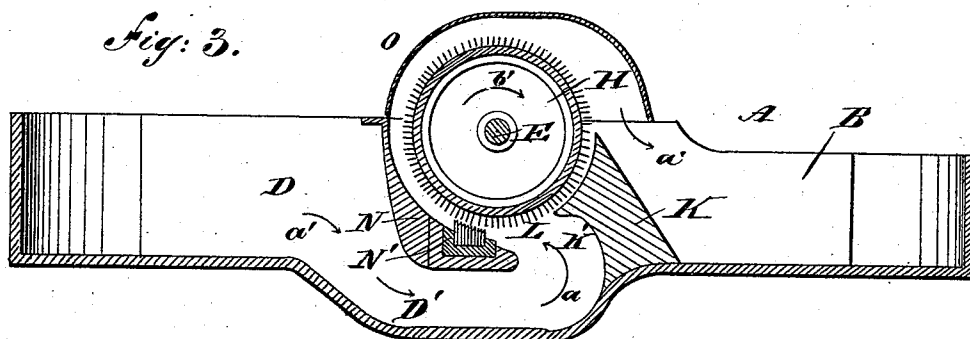
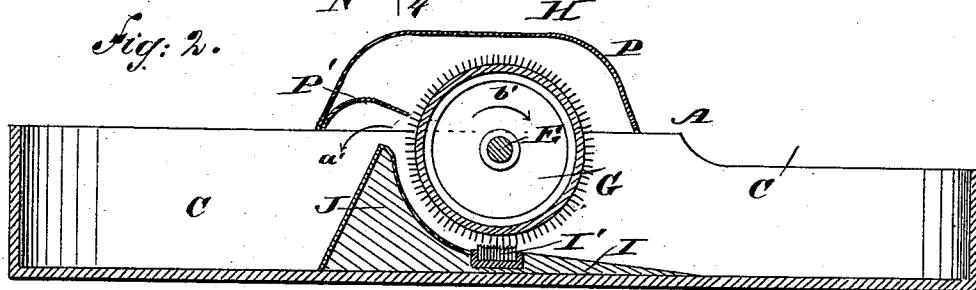
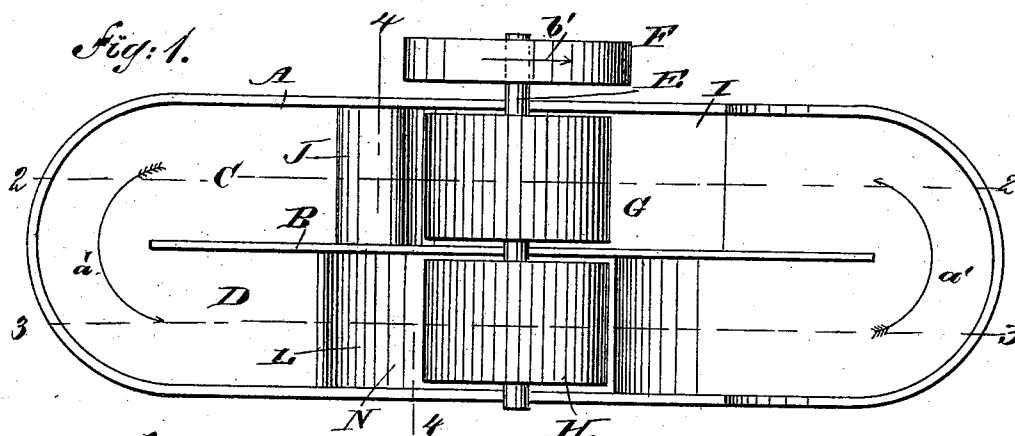


(No Model.)

W. H. ETHELL.
BEATING ENGINE.

No. 538,903.

Patented May 7, 1895.



WITNESSES:

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UNITED STATES PATENT OFFICE.

WILLIAM H. ETHELL, OF DAYTON, OHIO.

BEATING-ENGINE.

SPECIFICATION forming part of Letters Patent No. 538,903, dated May 7, 1895.

Application filed March 25, 1892. Renewed March 28, 1895. Serial No. 543,591. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. ETHELL, of Dayton, in the county of Montgomery and State of Ohio, have invented a new and Improved Beating-Engine, of which the following is a full, clear, and exact description.

The invention relates to paper making, and its object is to provide a new and improved beating engine which is simple and durable in construction, very effective in operation, and arranged to thoroughly and uniformly beat the stock to a proper consistency in a very short time.

The invention consists of certain parts and details and combinations of the same, which will be fully described hereinafter, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a plan view of the improvement. Fig. 2 is a sectional side elevation of the same on the line 2 2 of Fig. 1. Fig. 3 is a similar view of the same on the line 3 3 of Fig. 1, and Fig. 4 is a transverse section of the same on the line 4 4 of Fig. 1.

The improved beating engine is provided with the usual vat or tank A, having in its middle the usual mid-feather B dividing the vat or tank into the two compartments C and D connected with each other at the rounded-off ends of the said vat or tank. In the middle of the vat A is journaled the transversely extending shaft E carrying at one outer end a pulley F connected with suitable machinery for imparting a rotary motion to the said shaft E. On the latter are secured the two beating rollers G and H, of any approved construction, and arranged in the compartments C and D respectively, on the opposite sides of the mid-feather B.

In the bottom of the compartment C and leading to the beating roller G, is arranged a bed plate I provided with the usual bottom plate I' arranged directly below the beating roller G and operating in conjunction with the same in the usual manner. In the rear of the roller G is arranged the usual back-fall J over which passes the stock, after leaving the said roller G, the stock traveling in the direc-

tion of the arrows *a'* indicated in the drawings.

In the front of the beating roller H is arranged a back-fall K, the rear side K' of which is curved and serves as a guide to direct the stock to a channel L formed between the bed plate N and the beating roller H, the said bed plate N extending transversely under the rear of the beating roller H and supporting the usual bottom plate N', as is plainly shown in Fig. 3. The lower end of the channel L is connected with a channel D' extending under the bed plate N and leading to the compartment D, so that the stock entering the compartment at the left end passes down into the channel D', up the same, and by being deflected by the rear side of the back-fall K, passes into the channel L and through the same over the roller H, and down the back-fall K to the right hand end of the compartment D, to then travel into the compartment C to be treated by the roller G.

In order to prevent the stock from being thrown out of the vat when traveling over the roller H, a hood O is provided, extending over the said roller from the upper end of the bed plate N and in front of the upper end of the back-fall K. A similar hood P is arranged over the roller G, the hood being provided, at its rear end, with a deflector P' for guiding the stock over the back-fall J, as will be readily understood by reference to Fig. 2.

The operation is as follows:—When the stock is in the vat or tank A and the shaft E is rotated in the direction of the arrow *b'*, then both beating rollers travel simultaneously and in the same direction, the stock then being caused to travel in the vat in the direction of the arrows *a'*. The stock in the right-hand end of the compartment C, passes up the bed plate I and between the beating roller G and bottom plate I', up the rear of the back-fall J to be thrown over the front of the same into the left hand end of the compartment C, from which the stock travels into the compartment D down into the channel D', and up through the channel L between the bed plate N and roller H. The stock is carried by the said roller upward over the same to be finally discharged over the front of the back-fall K into the right hand end of the compartment

D, from which the stock again travels to the right hand end of the compartment C to be treated further, in the manner above described, by the beating roller G.

5 It will be seen that as the two rollers G and H travel at the same rate of speed, a high rate of speed is given to the stock, so that the latter is beaten in about half the time that is usually required in the ordinary beating engines.

10 It will be understood that the stock is subjected to a large amount of beating surface on the rollers G and H and their bed plates I and N, so that the stock is thoroughly and uniformly mixed and a higher grade of stock is obtained.

It will further be seen that the two back-falls J and K are arranged on opposite sides of the shaft E in front and rear of the respective rollers G and H, so that the flow of the stock is continuous and the stock is thoroughly and uniformly mixed.

Having thus described my invention, I claim as new and desire to secure by Letters

25 Patent—

1. A beating engine, comprising a tank provided with a continuous channel for the circulation of the stock, said channel having an essentially continuous inner wall, beating rollers located in the said channel and back-falls arranged one for each roller and located on opposite sides of the rollers placed on oppo-

site sides of the said continuous inner wall to pass the stock under the rollers on one side of the said wall and over the rollers on the other side thereof, substantially as shown and described.

2. A beating engine comprising a tank, a mid-feather, a shaft journaled in the said tank, two beating rollers secured on the said shaft on opposite sides of the said mid-feather, bed plates arranged under the said rollers and forming channels with the same, a back-fall arranged at the rear of one roller and a second back-fall arranged in front of the other roller, substantially as shown and described.

3. In a beating engine the combination with a tank having a mid-feather forming two compartments, of which one is formed with a channel in its bottom at or near the middle thereof, of a shaft journaled in the said tank, beating rollers secured in the said shaft on opposite sides of the said mid-feather, one of the said beating rollers being located above the said channel, bed plates arranged under the said beating rollers, a back-plate arranged in front of the roller located over the said channel and a second back-fall arranged in the rear of the other roller, substantially as shown and described.

WILLIAM H. ETHELL.

Witnesses:

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EDWARD J. FARRELL.