No. 871,540. PATENTED NOV. 19, 1907.

S. R. WAGG.

WASHING OR BEATING ENGINE.

APPLICATION FILED MAR. 13, 1906.

Fig. 2.

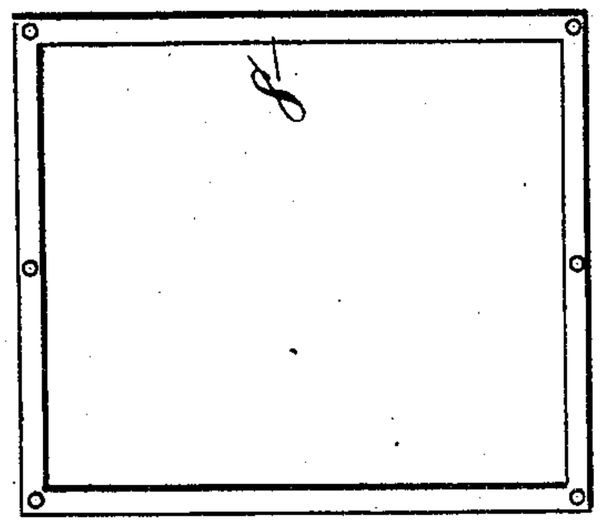
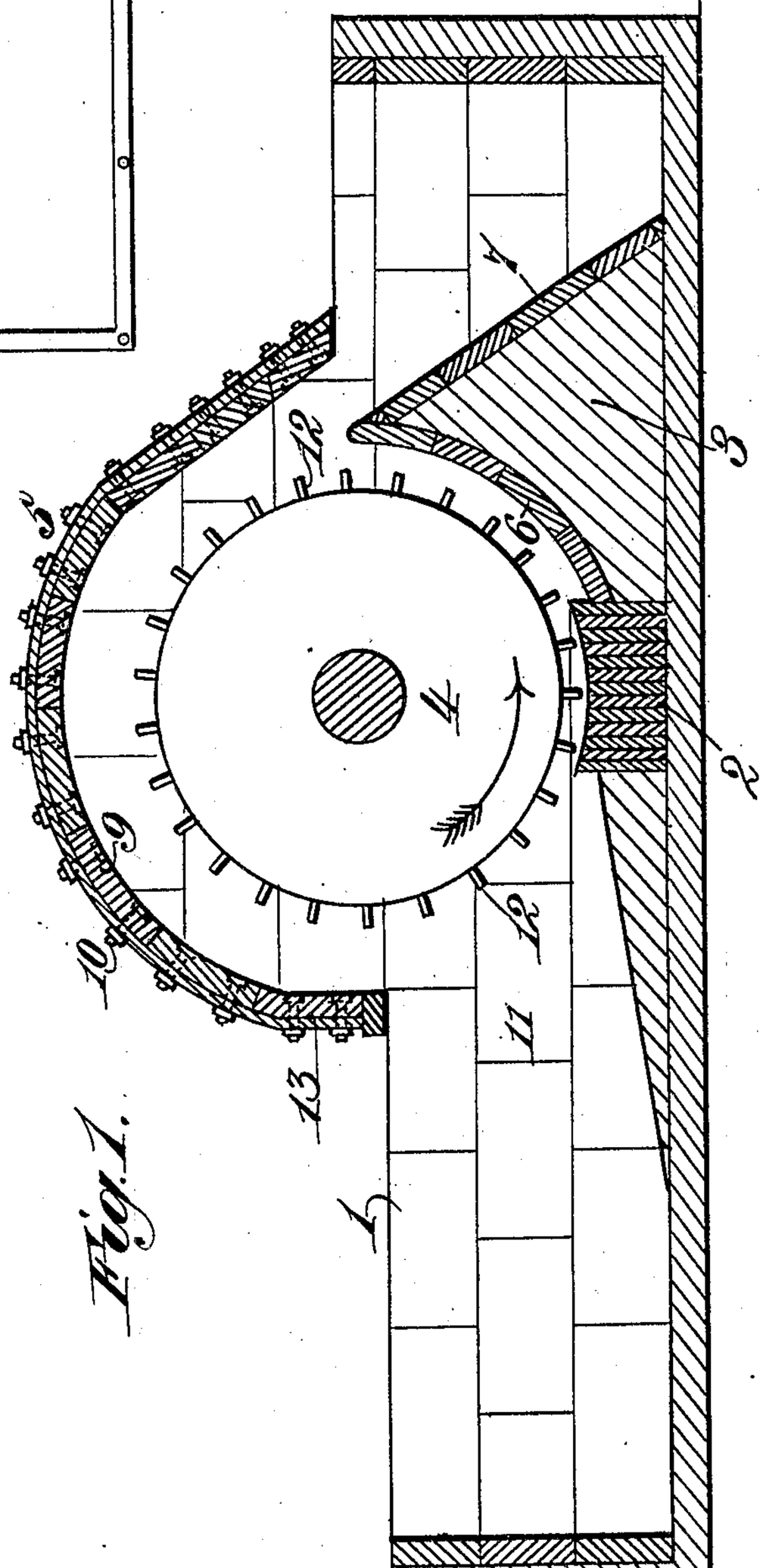


Fig. 1.



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WASHING OR BEATING ENGINE.

No. 871,540. Specification of Letters Patent. Patented Nov. 19, 1907.

Application filed March 13, 1906. Serial No. 305,857.

To all whom it may concern:

Be it known that I, SOLOMON R. WAGG, a citizen of the United States, residing at Appleton, in the county of Outagamie and State of Wisconsin, have invented new and useful Improvements in Washing or Beating Engine Constructions, of which the following is a specification.

This invention relates to that class of machines or engines commonly employed for reducing rags, wood-pulp, old paper, jute, and other raw material, to pulp for use in making paper. These engines, according to the use to which they are put, are generally referred to as rag engines, beating engines, or washing engines; but, for the sake of brevity, I will hereinafter refer to such engines under the general term of "Holland engines".

The invention has for its object the employment in such engines of stone abrading surfaces, the stone blocks or slabs employed being so disposed with relation to the roll carrying the knives that the stock will be thrown against the stones and largely reduced by abrasive action as distinguished from the cutting action between the knives of the roll and the bed plate, as commonly practiced. This abrasive action may be used in addition to the action of the knives and bed plate upon the stock, or the abrasive action alone may be resorted to, in which case the bed plate will, for the time being, be a negligible element in the machine, or substantially so. In the class of engines referred to, the roll, as well known, rotates with its knives in close proximity to the bed plate, and a great amount of power is required to run the machines owing to the fact that the tough, raw material must pass between said roll and bed plate to be reduced.

One of the main objects of my invention is to permit of the operation of these machines at the expenditure of much less power than is now required, to which end the roll is adjusted to rotate at a considerable distance, relatively speaking, from the bed plate, so that a considerable clearance space is provided between said roll and bed plate, the decrease in the cutting action ensuing thereby being more than compensated for by the abrasive action of the stones employed, as above referred to. It will thus be seen that a distinct and separate function is assigned to the roll in addition to that of cutting the stock, namely, that of throwing the stock by centrifugal action against the stones substantially surrounding the roll.

The invention is illustrated in the accompanying drawings, in which:

Figure 1 is a longitudinal sectional view through a Holland engine provided with my improvements; and Fig. 2 is a detail view of a frame which may be employed in securing the blocks of stone in position.

Referring now to the drawing, 1 indicates the tub, 2 the bed plate, 3 the back-fall, 4 the roll, and 5 the curb of an ordinary Holland engine, these parts being of the usual construction, except as hereinafter referred to, and needing no special description.

In proceeding according to my invention, I line the curved face of the back-fall 3 with stone blocks 6, and the rear or inclined face with similar stone blocks 7. These blocks may be mounted on the back-fall in any preferred manner, as by being secured in a frame 8, such as shown in Fig. 2, and then bolting the frame to the back-fall.

The interstices between the stone blocks may be filled in with melted brimstone which, when it hardens, will serve to unite the blocks firmly together. I also line the curb 5 with stone blocks 9, and have shown these blocks as being held to the curb by means of bolts 10. But frames similar to that shown in Fig. 2 may be employed for holding the stones on the curb and, in fact, other devices than those illustrated, which may be found desirable, may be employed for this purpose.

In order to increase the abrasive action between the roll and the curb, I preferably curve or incline the edge portion of the curb on the side of the roll opposite the back-fall 3, toward said roll, which construction offers an increased resistance to the flow of the stock downward over the surface of the stones with which the curb is lined and thereby increases the abrasive action at this point. As is well known, during the operation of the machine there is a continuous circulation of the stock within the tub 1 and also a considerable "swash" in the spaces between the ends of the roll and the sides of the tub. I utilize this movement or agitation of the stock by presenting additional stone surfaces against which it will rub in its movement in the tub. To this end, I line the sides of the tub, and especially that portion of the tub and the ends of the curb

opposite the roll with stones 11, so that the stock will be further subjected to the abrasive action of these stones in its movement or circulation in the tub. In operation the stock passes under the roll in the direction indicated by the arrow, and the roll revolves in the direction indicated by the arrow. As the stock passes over the bed plate 2, it is thrown by the knives 12 of the roll against the stone block 6 of the back-fall, and after passing over the top of the back-fall it slides over the stones 7 secured on the inclined side thereof, and in this operation is subjected to a considerable abrasive action. Not all of the stock, however, passes over the back-fall, but a considerable part thereof is carried up by the knives 12 and thrown by centrifugal force against the stones 9 with which the curb 5 is lined, and at the inclined part of the curb, indicated at 13, is subjected to an increased abrasive action as before explained. A certain amount of the stock also passes over the ends of the roll, and together with that portion of the stock passing over the back-fall, and which circulates around in the tub, to be again brought under the roll, is subjected more or less to the abrasive action of the stones lining the ends and sides of the tub.

As stated above, the roll 4 may be adjusted at any desired distance above the bed plate 2 within the limit of adjustment of the machine, in which position much less power will be required to run the engine, or, where rapid reduction is required, or where the character of the stock being reduced does not offer great resistance, the roll 4 may be adjusted to rotate with its knives at the usual distance from the bed plate 2.

I claim:

1. In a Holland engine, a back fall independent of the bed plate of the engine and having a curved and an inclined side, and an abrasive stone working face for the respective sides.

2. In a Holland engine, the combination with a roll and bed plate, a back fall having a curved and an inclined side, and an abrasive stone facing for the respective sides, the facing of the curved side of the back fall having one end contiguous and arranged below the top of the bed plate and in the rear thereof.

3. In a Holland engine, a curb having its inner surface faced with stone.

4. In a Holland engine, a curb having its inner surface faced with abrasive stone and one lower edge portion thereof inclined toward the roll.

5. In a Holland engine, in combination with the roll, a curb having its inner surface faced with stone, and a back-fall having its curved and inclined sides also faced with stone.

6. In a Holland engine, a tub having side and end walls, and an abrasive stone covering at the opposite end walls to fiber the stock.

7. In a Holland engine, a tub having side and end walls, and an abrasive stone lining covering the entire interior faces of the walls.

8. In a Holland engine, the combination with a bed plate, a back fall in rear of the latter and having a curved surface, and an abrasive stone lining for said curved surface to form a working face.

9. In a Holland engine, in combination with the roll and bed plate, a curb having its surface facing the roll lined with stone.

10. In a Holland engine, in combination with a roll and a bed plate, the latter having metallic cutting surfaces, a back fall at one side of the bed plate and having its working face opposite the roll provided with abrasive stone.

11. In a Holland engine, the combination with a roll, a back fall having a curved side, an abrasive stone for said curved side, and a curb having its inner surface lined with abrasive stone, the lower edge of the latter being inclined towards the roll, the curved side of the back fall and the lower edge of the inner lining of the curb being coöperative to automatically absorb swash and for fibering rags to a pulp.

12. In a Holland engine, a roll, a tub having the sides thereof opposite the ends of the roll faced with abrasive stone, a curb arranged over the roll projecting forwardly and rearwardly therefrom and lined throughout with abrasive stone, and a back fall having its curved side faced with abrasive stone.

13. In a Holland engine, a roll, a tub having the sides thereof opposite the ends of the roll faced with abrasive stone, a curb arranged over the roll projecting forwardly and rearwardly therefrom and lined throughout with abrasive stone, and a back fall having its curved and inclined sides faced with abrasive stone.

14. In a Holland engine, a roll, a tub having the sides thereof opposite the ends of the roll faced with abrasive stone, a curb arranged over the roll projecting forwardly and rearwardly therefrom and lined throughout with abrasive stone, and a back fall having its curved and inclined sides faced with abrasive stone, said curb having the rear portion thereof overhanging the inclined side of the back fall.

15. In a Holland engine, the combination with a roll, of a curb arranged over the roll and at the front and rear thereof, said curb having its inner face lined with abrasive stone, and a back fall having its curved and inclined sides faced with abrasive stone, said curb having the rear portion thereof overhanging the inclined side of the back fall to automatically absorb swash and for fibering rags to a pulp.

16. A Holland engine, comprising a roll, a

back fall having its front and rear faced with stone, and a curb having its inner face lined with stone, said curb arranged over said roll and having the rear portion thereof arranged in proximity to and overhanging the rear face of the back fall for automatically absorbing swash and for fibering the substance worked upon.

17. In a Holland engine a curb having a portion thereof formed in a curvilinear manner and the remaining portion inclined, said curb further having its inner face lined throughout with abrasive stone.

18. A Holland engine comprising a bed-plate having its upper face curved, a back fall having its forward face curved and its rear face inclined, the curvature of the top face of the bed-plate being upon a greater arc than the curvature of the forward face of the back fall, the forward face of the back fall terminating in the rear of the bed-plate below the top thereof.

19. A Holland engine comprising a back fall having curved and inclined faces, said faces lined with abrasive stone, and a curb having the rear portion thereof over-hanging the inclined face of the back fall and arranged in close proximity thereto so as to form a contracted passage between the top of the back fall and the inner face of the curb, said curb having its inner face lined throughout with abrasive stone.

20. A Holland engine comprising a back fall having curved and inclined faces, and a curb having the rear portion thereof over-hanging the inclined face of the back fall and arranged in close proximity thereto so as to form a contracted passage between the top of the back fall and the inner face of the curb.

21. In a Holland engine having a roll, a back fall having a curved side adjacent to the roll and arranged in the rear of the bed plate, and an abrasive stone lining covering the curved side.

22. In a Holland engine, a roll, a tub having the sides thereof opposite the ends of the roll faced with abrasive stone, a curb arranged over the roll projecting forwardly and rearwardly therefrom and lined throughout with abrasive stone, and a back-fall having its curved side faced with abrasive stone.

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

SOLOMON R. WAGG.

Witnesses:
ORLANDO E. CLARK,
DELBERT UTTER.