(No Model.)

S. L. BEAN.

ROLLER GRINDING MILL.

No. 275,568. Patented Apr. 10, 1883.

Fig. 1.

Fig. 2.

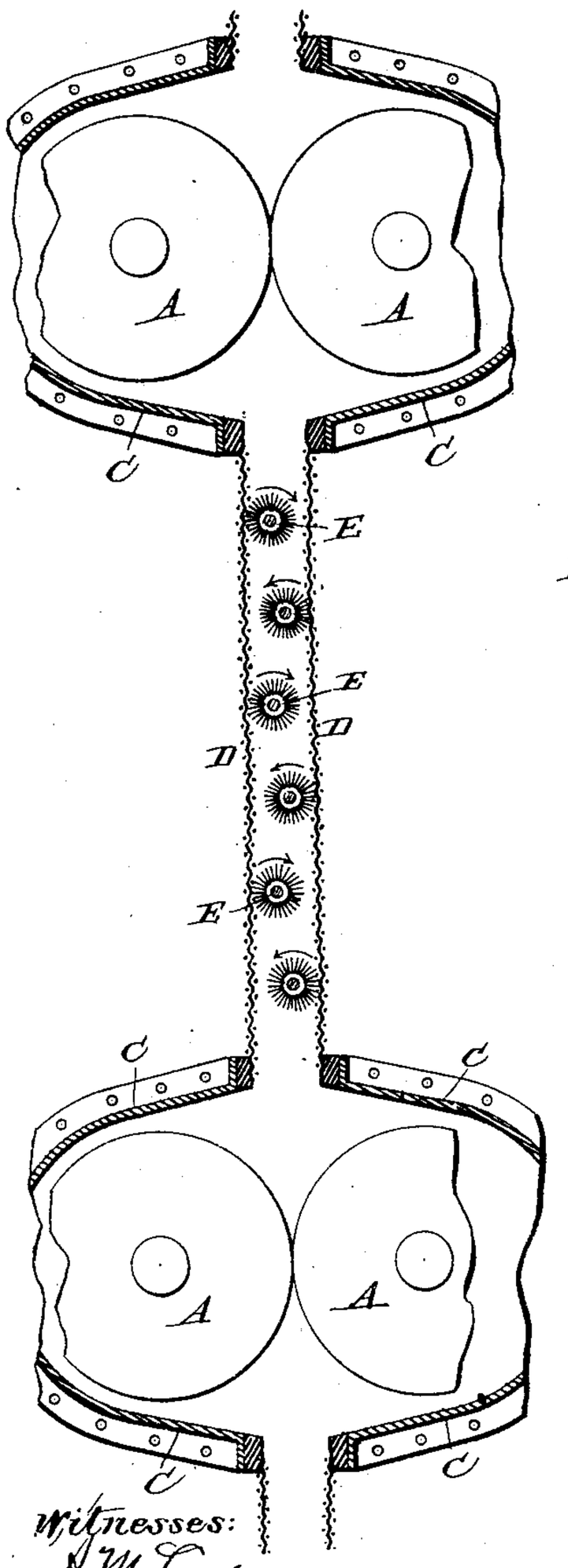
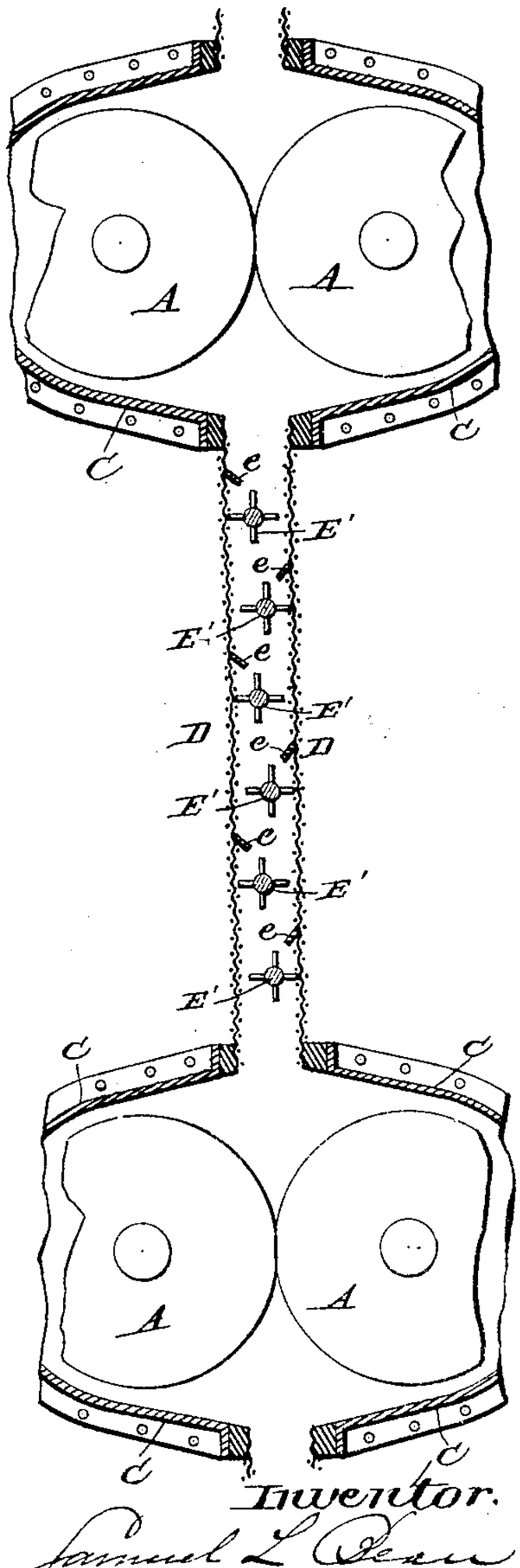
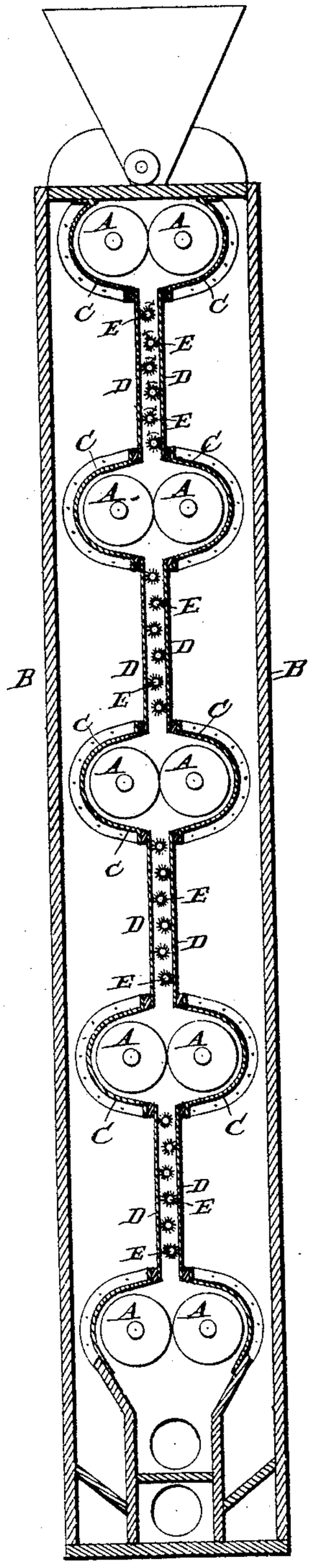


Fig. 3.





Witnesses:
A. M. Long.
E. J. Walker

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by his attorney
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UNITED STATES PATENT OFFICE.

SAMUEL L. BEAN, OF WASHINGTON, DISTRICT OF COLUMBIA.

ROLLER GRINDING-MILL.

SPECIFICATION forming part of Letters Patent No. 275,568, dated April 10, 1883.

Application filed December 4, 1882. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL L. BEAN, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Roller Grinding-Mills; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to screening devices for separating the fine flour and middlings from the chop delivered by the grinding or crushing devices of grain-reducing mills.

The improvement is intended especially for application to roller grinding-mills, but may also be used with other mills.

The object of the invention is to secure a thorough separation of the flour and middlings from the chop, and to cool the latter as it passes from one pair of rollers to another in the successive steps of reduction. To this end I use devices which throw the chop back and forth against the two screens alternately, and at the same time produce air-currents which facilitate the separation and cool the chop and flour.

The improvement consists, therefore, mainly in the combination, with a pair of screens, of intermediate chop-tossing devices arranged to throw the chop back and forth against the two screens alternately as it falls from the grinding or crushing devices of a grain-reducing mill.

In the accompanying drawings, Figure 1 is a vertical transverse section of a roller grinding-mill having a pair of vertical screens arranged below each pair of rollers except the bottom pair, the screens of each pair being separated by a passage through which the chop falls from a higher to a next lower pair of rollers, while in said passage are devices for turning the chop back and forth. Fig. 2 is an enlarged section of a single pair of screens and intermediate chop-tossing devices arranged between two pairs of grinding or crushing rollers. Fig. 3 is a similar section, illustrating a modification of the chop-tossing devices.

The letter A designates the grinding or crushing rollers, which are mounted in pairs in the usual supports, which it is not necessary to here illustrate.

B B indicate the walls of the chest inclosing the mill, and C C the casings which surround each pair of rollers, respectively, except at points above and below where the chop passes to and from the rollers.

Below each pair of rollers except the bottom pair is arranged a pair of vertical screens, D D, the screens of each pair being separated by a passage, the upper end of which is in position to receive the chop as it falls from the rollers above and its lower end in position to discharge the chop into the bite of the next pair of rollers below. The upper and lower ends of the screens are secured to the casing C.

Between the two screens D D of each pair is arranged a vertical series of chop-tossing devices, consisting in the present instance of rotary brushes designated by the letter E, the devices for rotating which are not shown, but may be of any convenient construction, such as spur or belt gearing applied to the journals of the brushes outside of the chest. These brushes are arranged in zigzag order, so that alternate brushes will be in contact with the inner surface of a single screen and separated by a narrow space from the other screen. The rotation of each brush is in the direction opposite to that of those next to it, as indicated by the arrows, the motion of all, however, being such that when the chop falls upon a brush which is in contact with one screen it will be thrown laterally against the other screen by said brush, the brushes thus successively tossing the chop back and forth against the respective screens as it falls from one pair of rollers to the next lower pair, so that the fine flour and middlings formed by each pair of rollers will be screened out and fall outside of the roller-casings to the bottom of the chest, or into any suitable receptacle arranged to receive the same, while the coarse chop passes on to the next lower pair of rollers, until finally the bran is discharged from the bottom pair and is taken care of in the usual manner.

It will be understood that the action of the chop tossers or brushes, while causing the chop to come in proper contact with the screens to thoroughly separate the fine flour and middlings without causing violent and continuous attrition of the bran or hulls, at the same time produces currents of air which pass laterally through the screens, thus cooling the falling

product of the rollers and assisting in the separation. The brushes have also the further function of keeping the screens clean.

In the modification shown in Fig. 3, I have substituted bladed rotary fans E′ for the brushes E, and provided the screens, on their inner surfaces, with deflecting-plates *e*, which direct the chop upon the fans, as the blades of said fans must of course not come in contact with the screen. The fans are arranged in similar order and to rotate in a manner similar to that of the brushes. These fans, while throwing the chop against the screens, produce strong air-currents, which not only effectually cool the chop and assist in the separation of the flour and middlings therefrom, but at the same time keep the meshes of the screens clear.

I do not confine myself to any particular forms of devices for tossing the chop back and forth against the screens or for producing lateral air-currents through the screens.

What I claim is—

1. The combination, with a pair of screens separated by a passage adapted to receive the product from grain grinding or crushing devices, of devices arranged between said screens for tossing the said product back and forth against the screens alternately, substantially as described.

2. The combination, with a pair of screens arranged as described, of a series of rotary brushes alternately in contact with opposite screens, substantially as and for the purpose set forth.

3. The combination, with a pair of screens arranged as described, of devices for producing lateral air-currents through said screens, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

SAMUEL LORENZO BEAN.

Witnesses:
W. D. THOMPSON,
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