

P. Frost.
Bed Plate for Pulp Engine.
N^o 94,816. Patented Sept. 14, 1869.

Fig. 1.

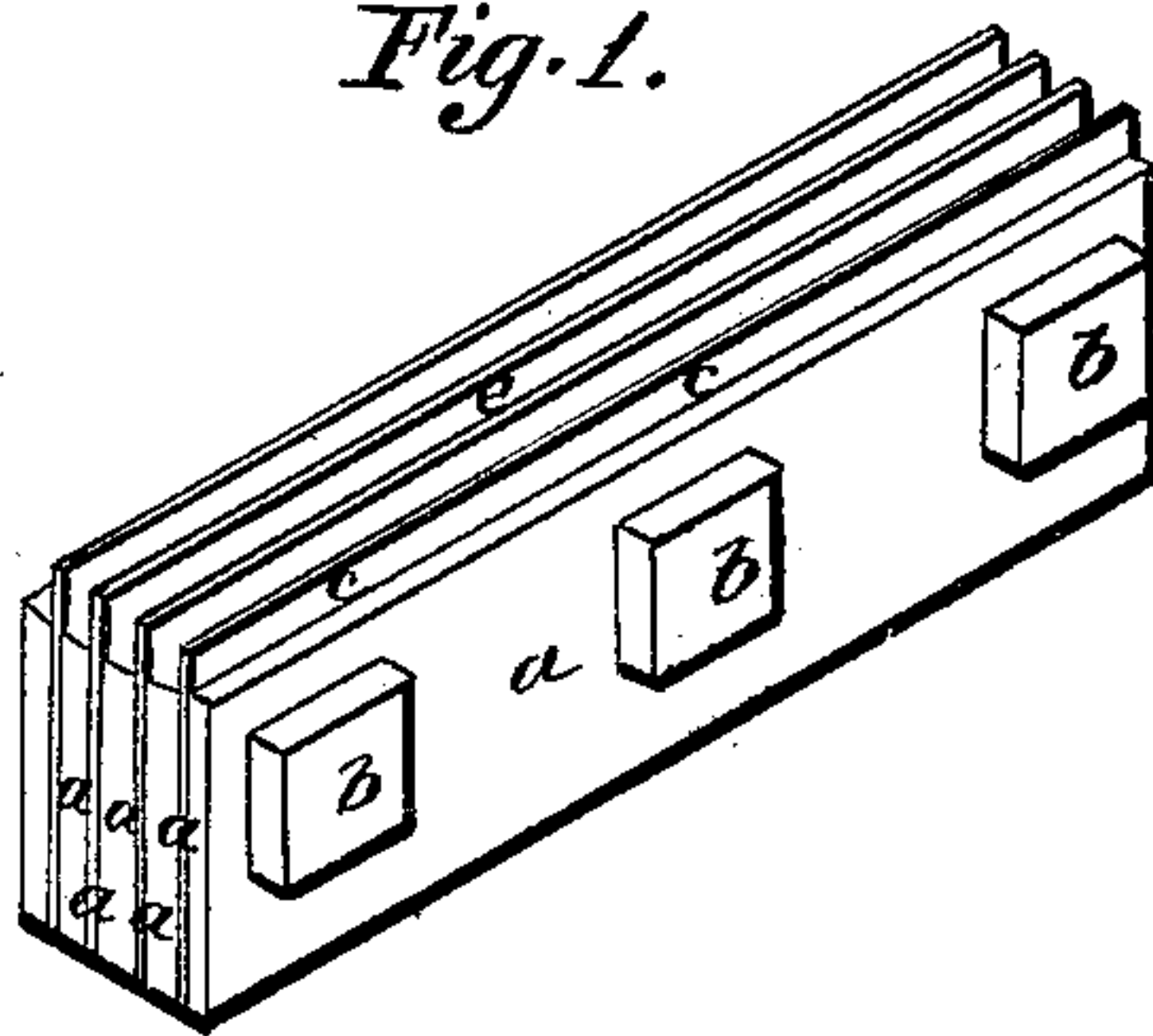
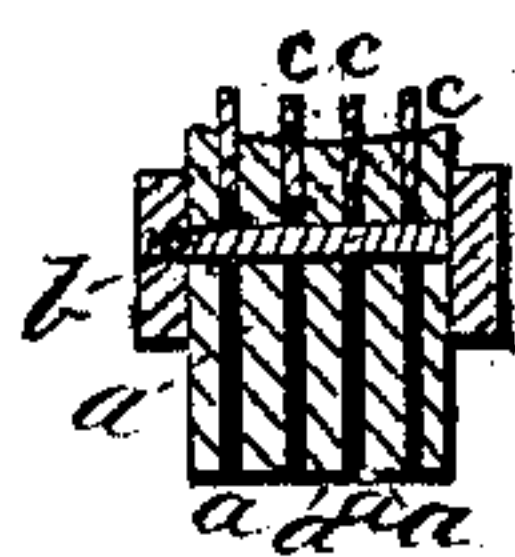


Fig. 2.



United States Patent Office.

PHINEAS FROST, OF MEDFIELD, MASSACHUSETTS.

Letters Patent No. 94,816, dated September 14, 1869.

IMPROVED GRINDING-PLATE FOR PAPER-PULP ENGINES.

The Schedule referred to in these Letters Patent and making part of the same

To all to whom these presents shall come:

Be it known that I, PHINEAS FROST, of Medfield, in the county of Norfolk, and Commonwealth of Massachusetts, have made an invention of a new and useful Improvement in Grinding-Plates of Paper-Pulp Engines; and do hereby declare the following to be a full, clear, and exact description thereof, due reference being had to the accompanying drawings, making part of this specification, and in which—

Figure 1 is a perspective view, and

Figure 2, a vertical and transverse section of my invention.

The invention herein described, and which constitutes the subject-matter of this patent, is an improvement in the manufacture of "bed-plates," so called, of paper-pulp grinding-engines, this bed, in general, being composed of a plurality of long thin plates of steel, laid side by side, edge uppermost, and bolted together, a bar of iron or wood being interposed between every two adjacent plates, in order to create intervening interstices to enable the operation of grinding the pulp to proceed effectively.

Several modes have been heretofore adopted in producing bed-plates for pulp-engines, the original one being an alternate series of steel plates or knives, and of sunken iron bars, bolted together, as before mentioned, the knives being ground to a bevelled edge, in order to produce a cutting-surface to the bed-plate.

The knives of a plate thus made were effective only for a short time, inasmuch as the thickness of their edges increased from the first moment of service.

Such knives required frequent grinding, and the labor of removing and grinding each knife was a matter of great moment in a large establishment, in addition to which the bed-plate entire must be raised up and "bolstered," to compensate for its decreased height, resulting from the wasting away of the knives.

A later mode of constructing a bed-plate was to employ, in place of the sunken iron bars, a series of wooden bars, disposed flush with the cutting-edges of the knives and wearing away in company with such knives, the knives in this case being composed of steel plates sufficiently thin to present at all times a cutting-edge.

It was found in practice that the action of wooden filling was injurious, inasmuch as, owing to the absence of intervening interstices between the knives, little cutting-edge was obtained.

This form of bed-plate was also subject to the same objection as that first mentioned, that is to say, it must be raised up to compensate for the waste of the knives.

This matter of raising and bolstering the bed was one of much time and annoyance, as much difficulty was experienced in adapting its cutting-surface to that of the revolving cylinder above it, and in making it sufficiently solid.

Still another and later, as well as much more effective manufacture of "bed-plate," is that shown and described in Letters Patent of the United States issued on the 23d day of May, 1865, to Oliver Morse, of Needham Lower Falls, Massachusetts.

This last invention is composed of a series of iron bars, arranged face to face together, and secured by bolts extending laterally through them, intervening spaces being thus created for reception of a series of thin steel plates or blades of sufficient width to wear for a considerable length of time; the main point sought and covered in this patent being to produce a series of cutters which should be susceptible of being raised above the edges of the supporting bars as fast as they may become worn.

These plates were of peculiar form, that is, they were provided with a series of slots, through which the confining bolts passed, these slots permitting of the necessary elevation of the plates.

Several important and decided objections have made themselves manifest in the practical use of this patented bed-plate.

One of the principal of such objections is the fact that as the bolts, which confine not only the cutting-plates or knives, but the whole bed-plate together, must be placed so low down to furnish sufficient metal above the slots of the former, a general insecurity or looseness and chattering of the upper and cutting-edges of the knives ensues.

As the operation of grinding rags into paper-pulp is one requiring solid and powerful machinery. This objection last named is one of great concern.

Another objection found to exist to the said patent bed-plate is the necessity of employing a number of keys or props of various widths, which must be placed under each knife, as it is raised, to compensate for the wear upon it, and the knives being of peculiar character, can be furnished only at a few and given places.

It has been found a matter of time and perplexity in the use of this patented plate to adjust its series of knives, after each successive elevation, to the circumference of the "roll," which acts in conjunction with it, since it becomes necessary to produce a concave cutting-surface to these knives in aggregate, this concavity corresponding to the periphery of the roll.

Another objection to the Morse plate, which is applicable to all others heretofore in use, is the fact that the general surface of the "roll" becomes, for some peculiar reason, convex in the direction of its length, owing to the length of time that it is subjected to the action of the knives, without change or removal of the latter.

My present invention consists in first forming a bed, composed of a series of bars, *a a*, &c., laid flatwise and bolted securely together, its construction enabling these

bolts *b b*, &c., to be placed as near as may be desired to its upper part.

Every alternate bar is of less width than its neighbor, thus creating shallow spaces for the reception of the cutting-knives *c c*, &c., or blades, which fill such spaces, it being observed that the upper edges of both series of bars are disposed transversely in a concave line, the radius of the circle of this concavity being equal to that of the roll, which operates upon the bed-plate.

In this way, I obtain a cutting-surface which is at all times and without any preparation or labor adapted to the cutting-surface of the roll, at the same time obviating a very serious objection to the roll first herein mentioned, as well as to the patented roll.

The knives in my invention are narrow blades of steel, sufficiently thin to present at all times a cutting-edge, and of a uniform and unvarying width and thickness.

As these knives require no peculiar preparation, but may be rolled out directly by any rolling-mill, they are produced at small cost, and in this respect obviate one important objection heretofore urged against the patented plate above referred to.

The knives of my bed-plate are narrow, in order that the confining-bolts may be brought near to the upper edge of the "bed-plate," which is easily accomplished, as these knives are entirely disposed above such bolts.

Care only should be taken that the knives possess sufficient width to receive a firm and unyielding bearing-surface.

I thus prevent looseness or chattering incident to the above-mentioned patented roll.

As soon as one of the narrow knives which I adopt is worn down to near the edge of the bars of the bed-plate, I loosen the bolts which confine the whole, re-

move such knives and replace them by new ones, and subsequently tighten the bolts to make all secure.

As the knives are of uniform width, the concavity of the cutting or grinding-surface of the bed-plate is perfect, while the time required to remove the old and insert the new knife is comparatively insignificant.

Another advantage incident to my invention which no other of its class possesses is, that, owing to the fact of the frequent renewal of the grinding-knives, and consequently their short term of service, a straight grinding or cutting-surface is at all times maintained upon the roll.

This is a matter of peculiar importance, and will be understood by experienced paper-makers.

Another advantage is seen in the use of my invention over the two first mentioned, inasmuch as no raising or propping of the bed-plate is requisite to compensate for the wear of its knives.

Claims.

I claim—

1. A "bed-plate," so called, for paper-pulp engines, composed of two series of upright bars and their movable knives or blades, when the latter are placed entirely above the confining-bolts of the device, and when the foundation of such knives is a concave surface transversely, essentially in manner and for the purpose as explained.

2. The body or foundation of a "bed-plate" for paper-pulp engines, composed of two series of bars, when the upper edges of such bars, in aggregate, compose concave surfaces transversely of their length, substantially in manner and for the purpose hereinbefore described and shown.

Witnesses:

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