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Patented Oct. 15, 1901.

C. MILLS.  
FLAT FOR CARDING ENGINES.

(Application filed Jan. 12, 1901.)

(No Model.)

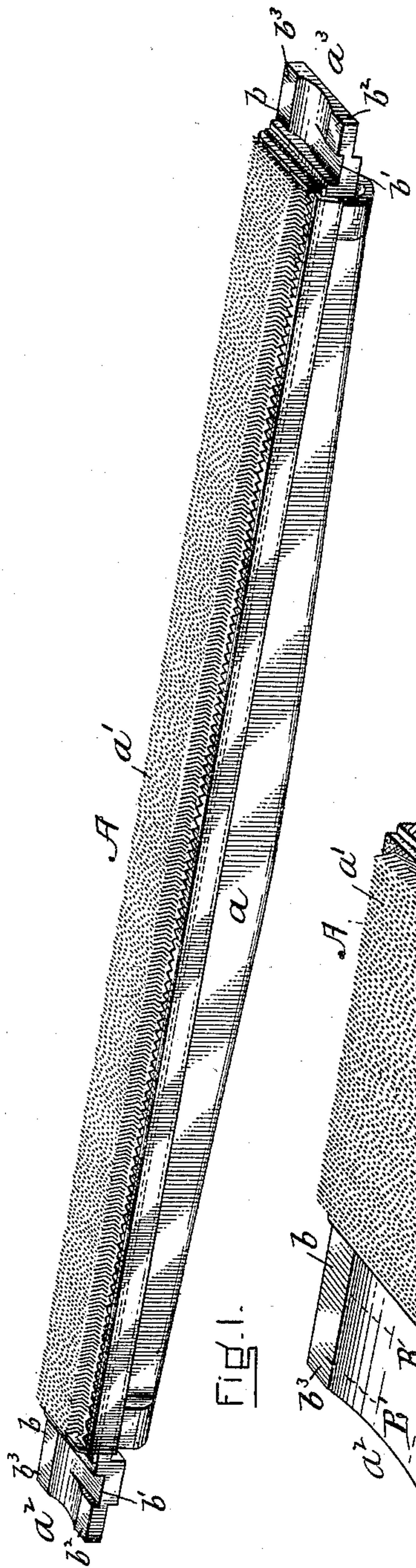


FIG. 1.

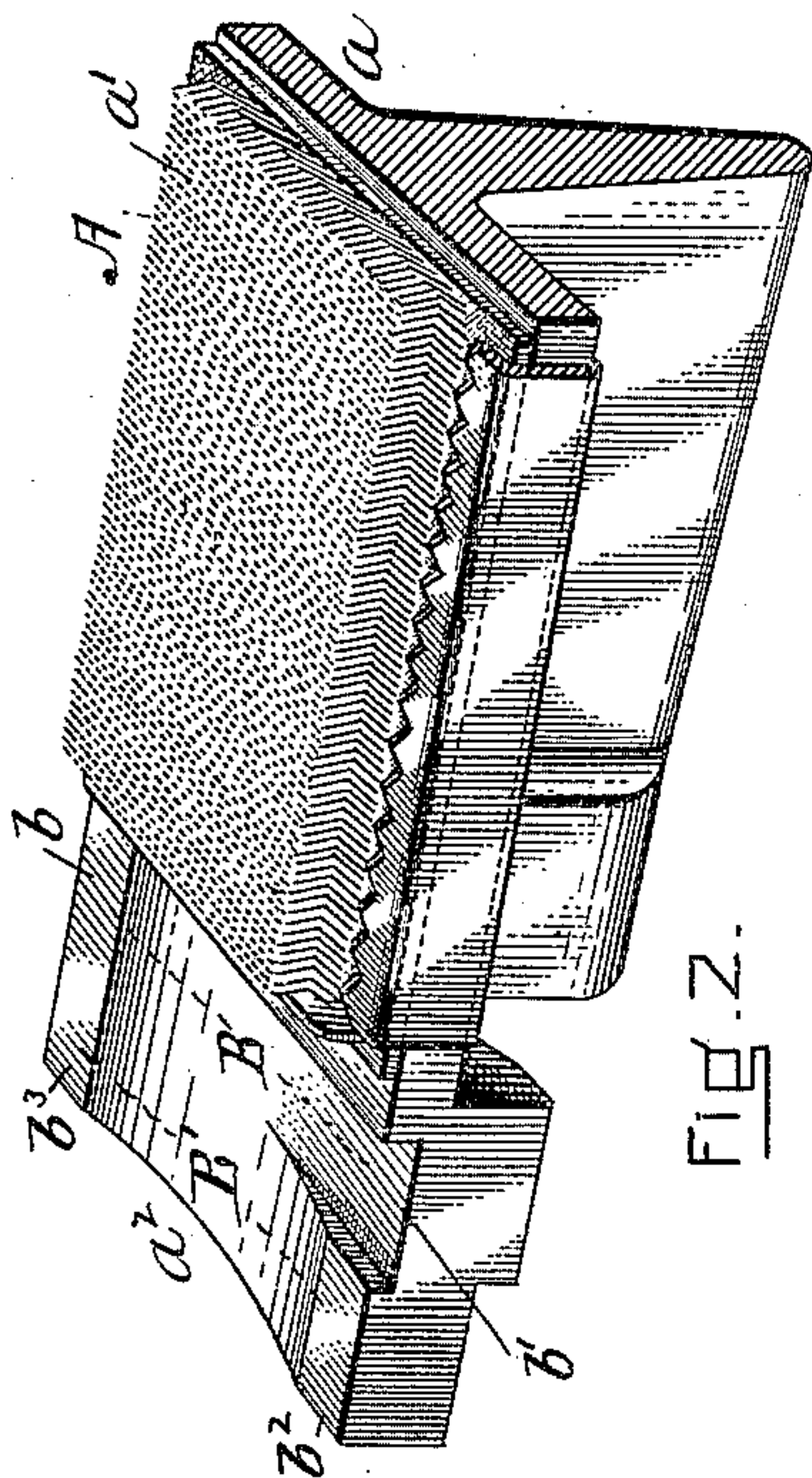


FIG. 2.

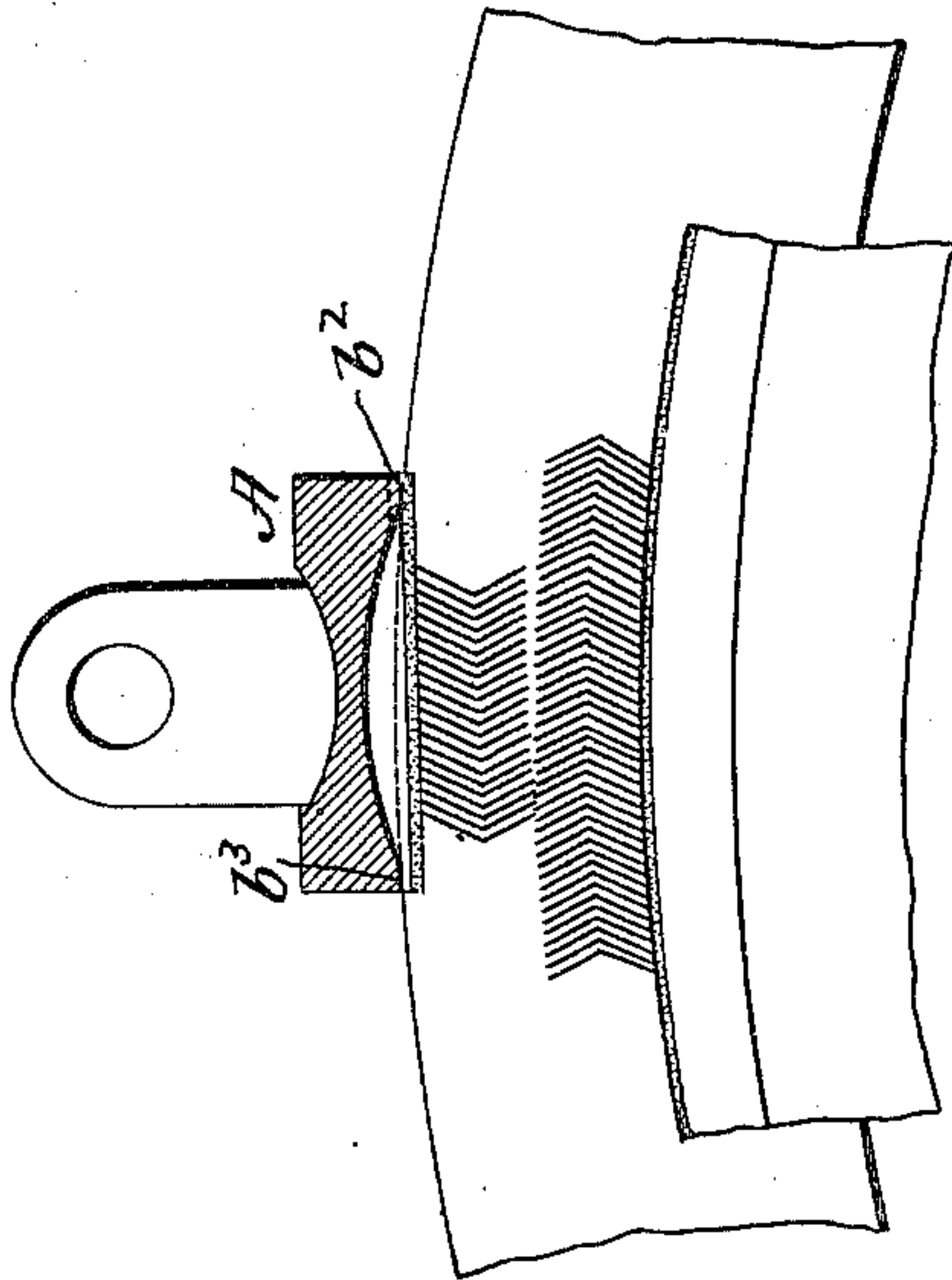


FIG. 4.

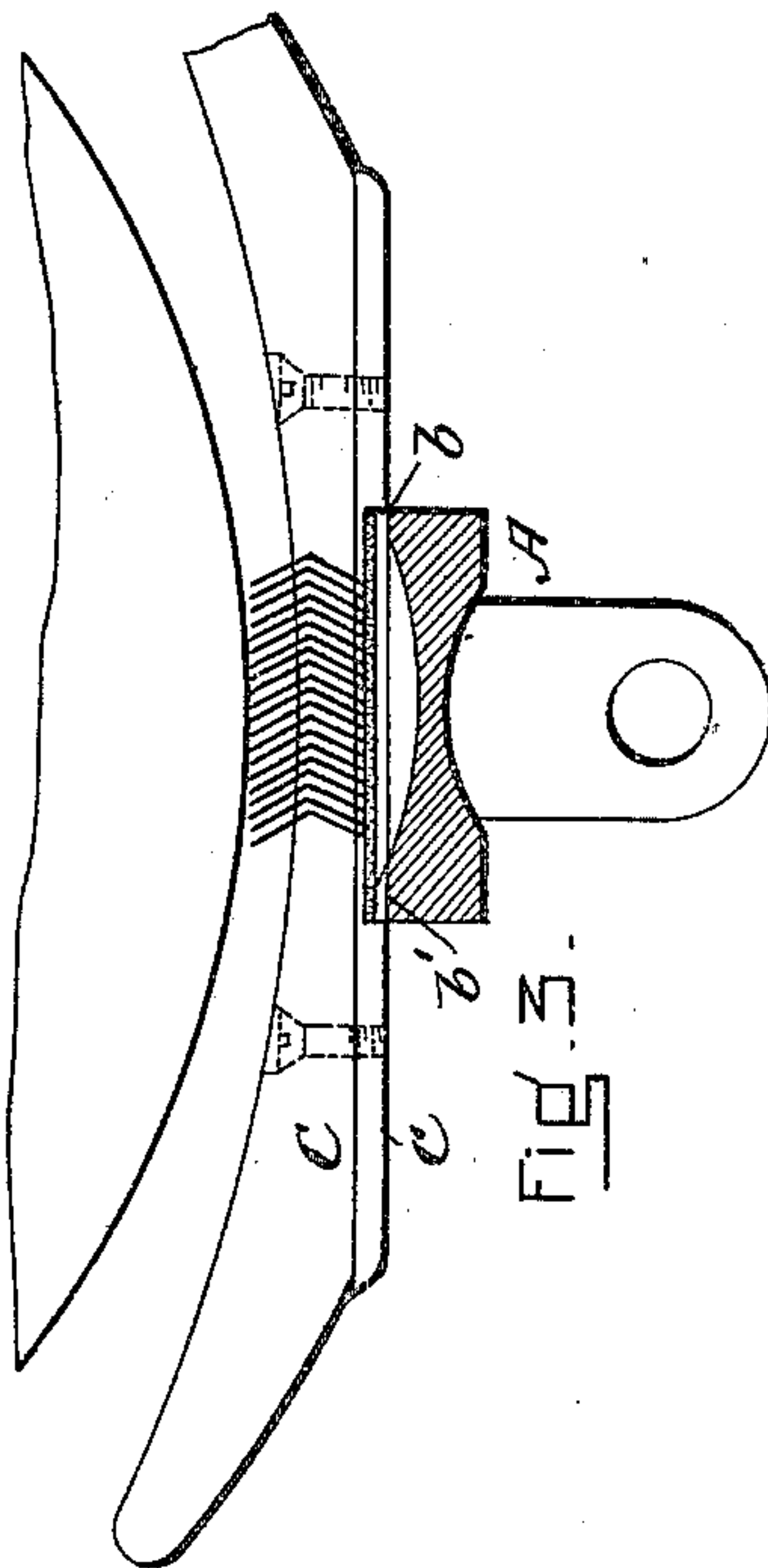


FIG. 3.

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# UNITED STATES PATENT OFFICE.

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## FLAT FOR CARDING-ENGINES.

SPECIFICATION forming part of Letters Patent No. 684,703, dated October 15, 1901.

Application filed January 12, 1901. Serial No. 43,021. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES MILLS, a citizen of the United States, residing at Newton, in the county of Middlesex and State of Massachusetts, have invented a new and useful Improvement in Flats for Carding-Engines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification, in explaining its nature.

The invention relates to a flat for a carding-machine which has upon its face at each end two guiding-surfaces, one of which is for use in guiding the flat to the grinding-roll during the grinding of the wire clothing of the flat and the other of which is used in connection with the flexible bend of the carding-engine to govern the feed and presentation of the flat with respect to the main revolving cylinder of the machine. The guiding-surfaces are upon the same side of the flat and also are side by side, and the guiding-surfaces for governing the presentation of the flat to the grinding-roll are of a nature to coöperate with the guides upon the grinding apparatus, having level or flat bearing-sections, so that the flats as they are moved along said guides to the grinding-roll are not caused to be tipped or turned during said movement; but the guiding-surfaces which govern the feeding and presentation of the flats to the main carding-cylinder are so shaped as to cause the flats to slightly tip while they are in working relation with the carding-cylinder and so that each flat may then present that part of its working surface which is known as the "heel" to the carding-cylinder.

I will now describe the invention more specifically and in connection with the drawings, wherein—

Figure 1 is a view in perspective of a flat having the features of my invention. Fig. 2 is a view in perspective of one end of the flat, enlarged, to better represent the invention. Fig. 3 is a view to show the relation between the flat-grinding roll and grinding-roll guides during the grinding of the wire surface of the flat, the flat being represented in section upon the line 3 3 of Fig. 1. Fig. 4 is a view to represent the relation between the flexible bend and carding-cylinder during the

operation of carding, the flat being shown in section upon the line 4 4 of Fig. 1.

Referring to the drawings, A represents a flat of a carding-engine. It comprises the usual iron base piece or bar *a* and the wire clothing *a'* upon its outer face. Each of its ends *a<sup>2</sup>* *a<sup>3</sup>* is provided with guiding-surfaces. The flat usually now used has but one guiding-surface at each end, and the same guiding-surfaces are used with the bends in governing the presentation of the flats to the carding-cylinder as are used in connection with the guides of the grinding apparatus in grinding the wire clothing, each of said guiding-surfaces being in two sections or parts, the level of which parts or sections is varied, and it is because of this variation in the level of the parts or sections of the guiding-surfaces that the guides of the grinding device have been either of two planes of differing levels when it is desired that the wire surface shall be ground flat or of a concave shape when it is desired that the wire surface shall be ground to rounded form. This double use of the flat guiding-surfaces has required a nicety of construction of all the coöperating parts which it is relatively expensive to obtain and a continuance of fine conditions in use which it is relatively difficult to maintain. In lieu of single guiding-surfaces at the flat ends upon each side of the wire clothing for conjoint use for grinding-machine guides and card-bends I use at each card end two guiding-surfaces. The guiding-surfaces B are the ones which are used in conjunction with the guides of the flat grinding apparatus, and the guiding-surfaces B' are the surfaces which are used in conjunction with the flexible bends of the carding-engine in the operation of carding. The guiding-surfaces B are so shaped as to permit in the grinding apparatus the employment of guides C having perfectly level or flat guiding-surfaces *c*, so that the flat in its movement by the grinding-roll has the two sections or parts *b* *b'* of each of the guiding-surfaces B in contact with said flat face and maintains that contact throughout the movement of the flat past the grinding-roll. There is no axial movement of the flat during this movement with respect to the grinding-roll while the grinding of the wire clothing is go-



ing on. (See Fig. 3.) The guiding-surfaces B' of the flat, which are upon the same side of the flat as the guiding-surfaces B and practically parallel with them, are also preferably in two parts or sections  $b^2$   $b^3$ , which are so shaped to coöperate with the flexible bends of the carding-engine and cause the flats to present the heel areas or sections of their wire clothing to the carding-cylinder. (See Fig. 4.)

The area of both the guiding-surfaces B B' may be increased by widening them.

A construction of flat which permits the employment of flat guides in the grinding apparatus is of large practical value in that it renders relatively simple a condition which was heretofore not easy to secure, for with a guide not flat there is difficulty in first obtaining its proper shape, then in making it, and afterward in continuing its shape because of wear; but these troubles disappear with the employment of a flat guide, and this improvement not only reaches the guides of the grinding mechanism, but also other parts of the mechanism and the flats as well, because the guiding-surfaces which coöperate with the guides of the grinding apparatus will wear flat and better when brought only into contact with flat surfaces, while the guiding-surfaces used with the bends of the carding-engine will wear truer and better because brought into contact only with the guiding-surfaces of the bends. Of course where guiding-surfaces are brought into contact with two sets of guides which differ in shape from each other the surfaces must sooner or later be impaired.

When the sections  $b$  of the guiding-surfaces B and the sections  $b^2$  of the guiding-surfaces B' are on the same level, the flexible bends of the carding-engine may be wide enough to extend beyond the surfaces B'; but this use does not modify the essential features of the invention, which are to provide the flat upon its face at both ends with guiding-surfaces which are used when the flats are being ground and in conjunction with the guides of the flat-grinding apparatus and with other guiding-surfaces which are not used in the grinding of the flats and are only used in conjunction with the flexible bends of the carding-engine during the operation of carding. This construction is the same whether the guides of the grinding apparatus which are used are curved or straight.

Having thus fully described my invention,

I claim and desire to secure by Letters Patent of the United States—

1. As an improved article of manufacture, a flat for carding-engines and similar machines having guiding-surfaces upon its face near its ends which are used only in conjunction with the guides of the flat-grinding devices.

2. The flat of the carding-engine or similar machines having guiding-surfaces upon its face near its ends which are used only in governing the presentation of the flats to a carding-surface during the operation of the engine and which are at one side of guiding-surfaces for governing the presentation of the flats to the flat-grinding devices.

3. A flat of a carding-engine or similar machine having two guiding-surfaces upon its face at each end, one set of which guiding-surfaces is fashioned to control the presentation of the flat to grinding devices and is used in conjunction with the guides of such devices, and the other set of guiding-surfaces is used only in conjunction with the bends of carding-engines or guiding-surfaces of similar machines in governing the presentation and movement of the flats with respect to other working parts of said engine or similar machines.

4. A flat having upon its face at each end two sets of independent guiding-surfaces, one set adapted for use in connection with a guide to a grinding-roll and the other set adapted for use upon the flexible bend of a carding-engine or the like, whereby upon engagement with one set of guiding-surfaces and the grinding-guide the flat will be presented to the grinding-roll and upon engagement of the other set with the flexible bend the flat will be caused to engage properly with the carding-cylinder, as and for the purposes described.

5. A flat for a carding-engine or similar machines having upon its face the two sets of guiding-surfaces, the sections or parts of which are arranged with respect to each other to effect in conjunction with the grinding devices and with the carding-engine or other similar machines the grinding of the heel of the flat and the presentation and feeding of the ground heel to the carding-cylinder.

CHARLES MILLS.

In presence of—

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EDWIN H. ALEXANDER.