

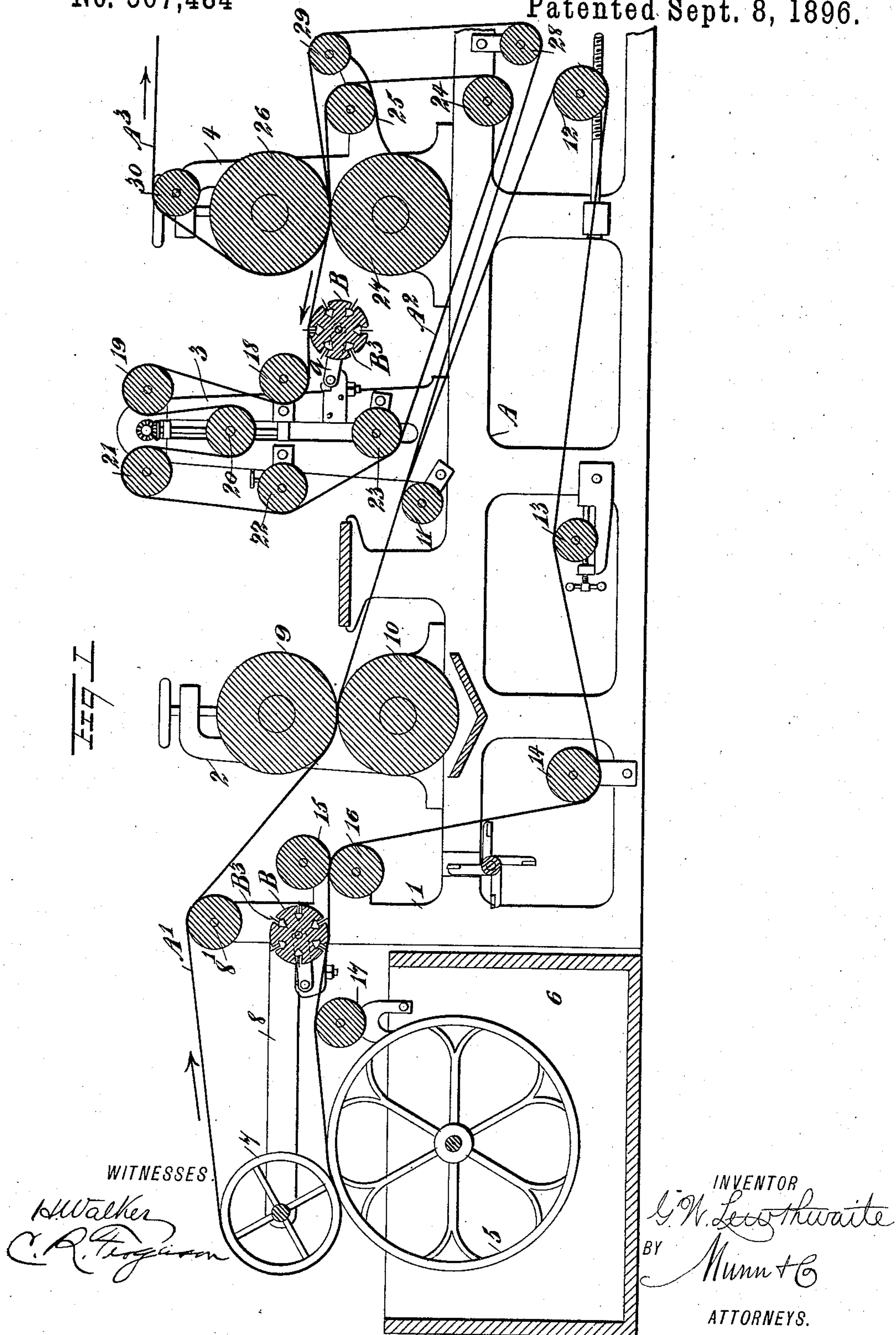
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2 Sheets—Sheet 1.

G. W. LEWTHWAITE.  
PAPER MAKING MACHINE.

No. 567,484

Patented Sept. 8, 1896.



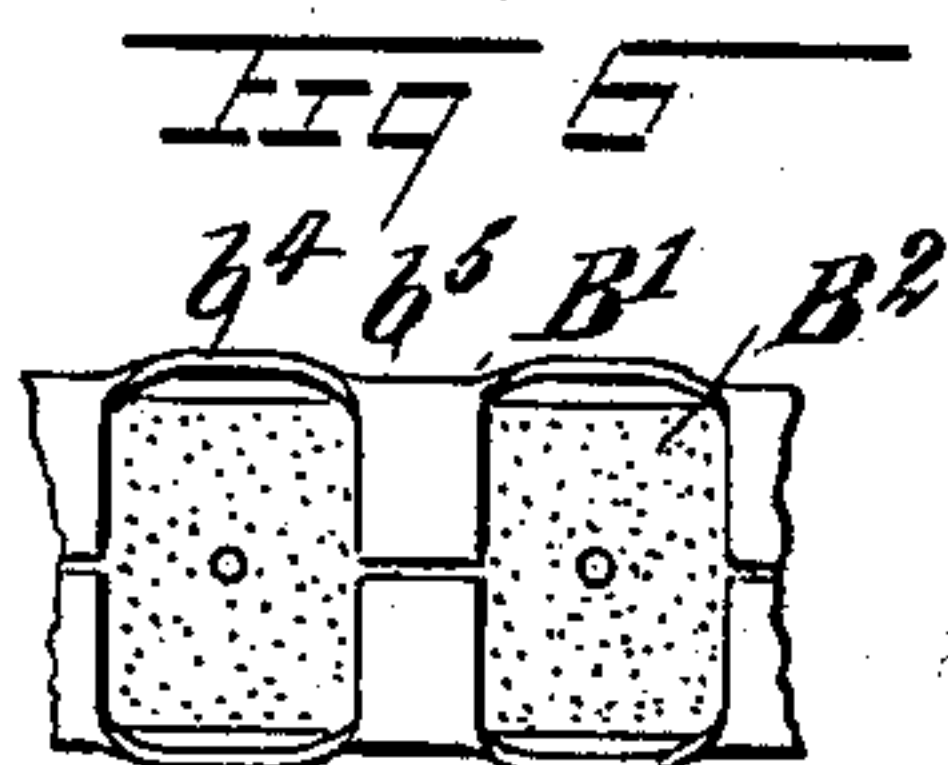
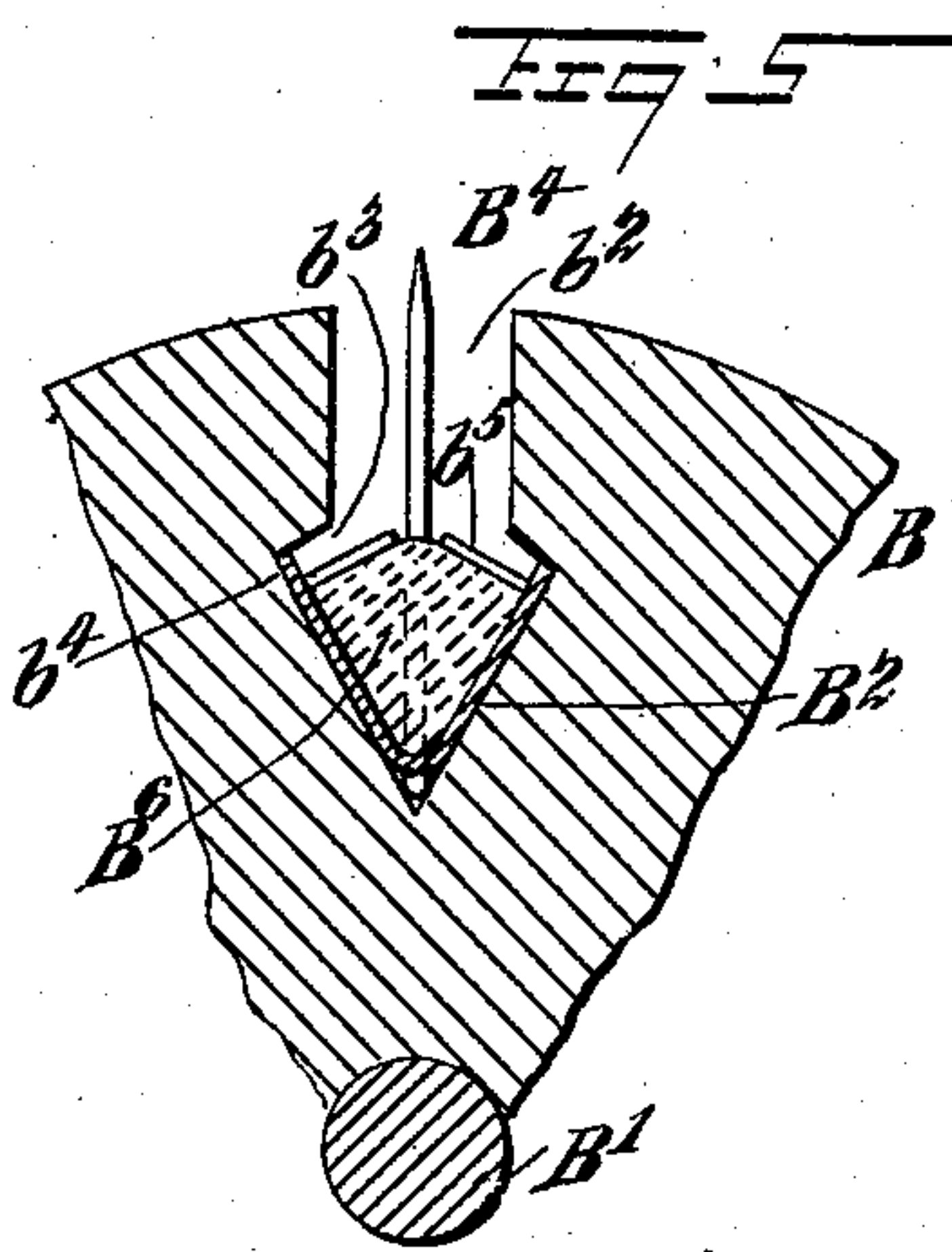
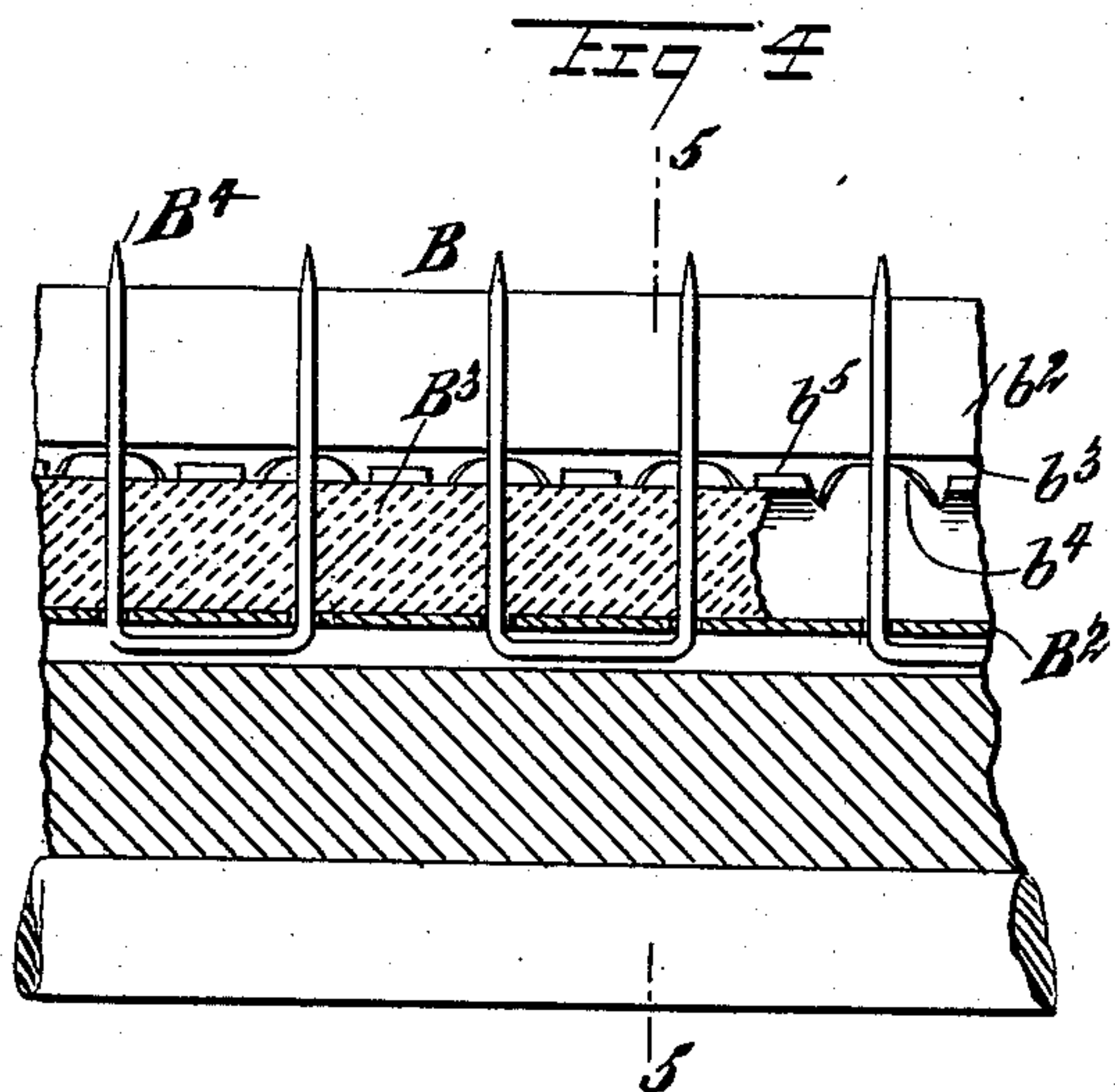
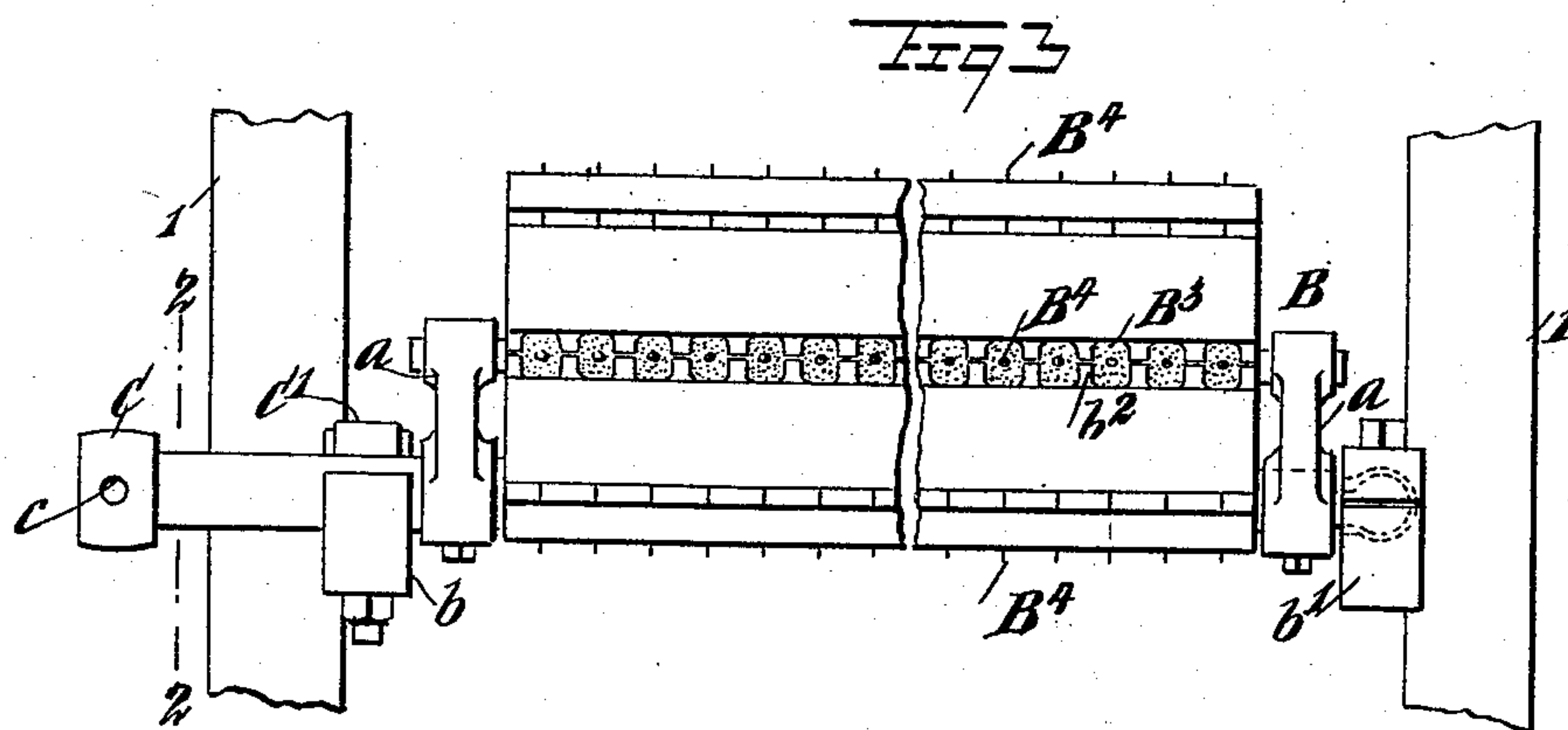
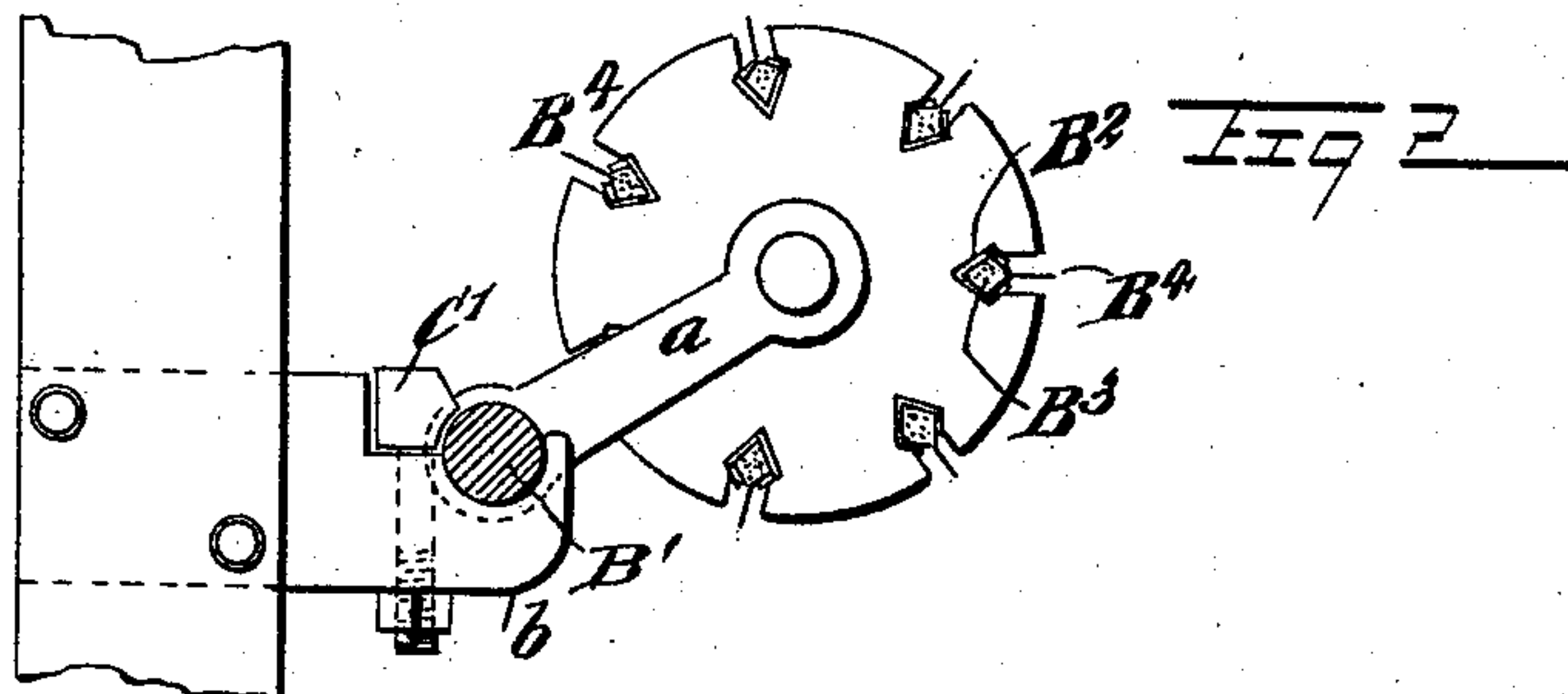
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# UNITED STATES PATENT OFFICE.

GEORGE WALTER LEWTHWAITE, OF GREENWICH, NEW YORK.

## PAPER-MAKING MACHINE.

SPECIFICATION forming part of Letters Patent No. 567,484, dated September 8, 1896.

Application filed December 16, 1895. Serial No. 572,329. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE WALTER LEWTHWAITE, of Greenwich, in the county of Washington and State of New York, have invented certain new and useful Improvements in Paper-Making Machines, of which the following is a full, clear, and exact description.

This invention relates more particularly to felt perforators for paper-making machines. In paper-making machines, endless belts of felt are employed for carrying the pulp in its wet state between compression-rollers to extract the water, which is forced through the felt and carried off by a trough. In this operation the felt soon becomes clogged to such an extent as to destroy its porosity, and thus render it useless. Puncturing devices, such as pins rigidly mounted on a roller, have been employed for piercing the felt, but as these pins do not yield they are very destructive to the felt, as they tear or cut it. My invention is intended to overcome these difficulties.

The invention consists in the construction and novel arrangement of parts, as will hereinafter appear and be particularly pointed out in the appended claims.

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

Figure 1 is a longitudinal vertical section of a paper-making machine embodying my improvement. Fig. 2 is an end view and a section on the line 2 2 of Fig. 3 of the perforator-roller. Fig. 3 is a front elevation thereof. Fig. 4 is a longitudinal section of the roller. Fig. 5 is a section on the line 5 5 of Fig. 4, and Fig. 6 is a plan view showing a portion of a yielding anchor employed.

Referring to the drawings, A designates the frame of the paper-making machine, on which are mounted the uprights 1, 2, 3, and 4.

A' is the endless felt band or apron for carrying the pulp received from a cylinder 5, rotating in a pulp-vat 6, through the first set of press-rollers. This endless felt or apron A' extends around a coucher 7, having journal-bearings in arms 8, extended from the upright 1 over the cylinder 5, thence over a roller 8', having journal-bearings in the upright 1, thence between press-rollers 9 10,

having journal-bearings in the upright 2, the bearings for the upper roller 9 being vertically adjustable in the usual manner. From the press-rollers the felt band or apron extends over a roller 11, mounted on the frame A, thence around a take-up or stretcher roller 12, which is journaled in bearings adjustable longitudinally of the machine-frame, thence over an adjustable guide-roller 13, thence under a roller 14, thence between squeeze-rollers 15 16, and thence over a roller 17, mounted to rotate over the vat 6 adjacent to the cylinder 5. A second endless felt or apron A<sup>2</sup> extends around rollers 18, 19, 20, 21, 22, and 23, supported by the uprights 3, thence around a roller 24, having journal-bearings in the frame A, thence over a roller 25, supported by an arm extended from the upright 4, and then between the second press-rollers 26 27, supported by the upright 4, the bearings for the upper roller 26 being vertically adjustable. In operation the pulp A<sup>3</sup>, delivered by the cylinder 5, is carried by the felt or apron A' between the press-rollers 9 10, where a greater portion of the moisture is extracted, then the sheet is separated from the apron A' and carried around rollers 28 29 to the second apron A<sup>2</sup>, which carries it between the second press-rollers 26 27, where the remainder of the moisture is extracted, and then the formed paper is carried over a roller 30 to a suitable drier.

Having described the general features of the machine and its operation, I will now describe the puncturing devices for the aprons.

A puncturing device is provided for each endless apron, but as they are of like construction a description of one will answer for both. The puncturing device comprises a roller B, having journal-bearings in arms a, extending from a rock-shaft B', having bearings in brackets b b', supported by the frame of the machine. One end of the shaft B' is provided with a head C, having transverse holes c, through which an instrument may be inserted to turn the shaft, and as a means to secure the shaft as adjusted I may employ a clamp C', having a head portion to engage the shaft. The roller is provided with a series of longitudinal slots b<sup>2</sup>, the inner portions of which are here shown as V-shaped in cross-section, and offsets or shoulders b<sup>3</sup> are formed



in the opposite side walls of the slots. Metal troughs  $B^2$  are seated in the V-shaped portions of the slots and are held securely in place by edge portions  $b^4$  engaging against the shoulders  $b^3$ , and between the edge portions  $b^4$  the metal is turned inward to form retaining-flanges  $b^5$ . Secured within each trough is a yielding material  $B^3$ —such, for instance, as rubber. Through the yielding material puncturing-pins  $B^4$  are extended, the points of which project beyond the periphery of the roller. I have here shown two pins formed of a single length of metal and extended loosely through holes in the apex or bottoms of the trough, as plainly shown in Fig. 4, but the pins may be single and located at any desired distance apart.

By the construction above described it is obvious that as an apron is carried over the roller  $B$  it will be punctured by the pins  $B^4$ , and as the apron continues in its movement the pins will yield circumferentially of the roller out of the felt without slitting it.

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

1. In a paper-making machine, a roller having longitudinal grooves, a yielding material in the grooves, means for locking the yielding material in the grooves, and puncturing-pins

supported by the yielding material, substantially as specified.

2. In a paper-making machine, a roller having longitudinal grooves shouldered in the opposite walls, metal troughs in the grooves, having portions engaging the shoulders, yielding material in the troughs, and pins supported by the yielding material, substantially as specified.

3. In a paper-making machine, a roller having longitudinal slots substantially V-shaped in cross-section, and having the shouldered portions, troughs in said slots secured by the shoulders and having the inwardly-turned flange portions, a yielding material in the troughs, and the pins supported thereby, substantially as specified.

4. In a paper-making machine, a roller having shaft-bearings in brackets on the machine-frame, one end of said shaft being extended outward and provided with a turning head, a clamp extended through one of the brackets and having a head to engage the shaft, and puncturing-pins on the roller, substantially as specified.

GEORGE WALTER LEWTHWAITE.

Witnesses:

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