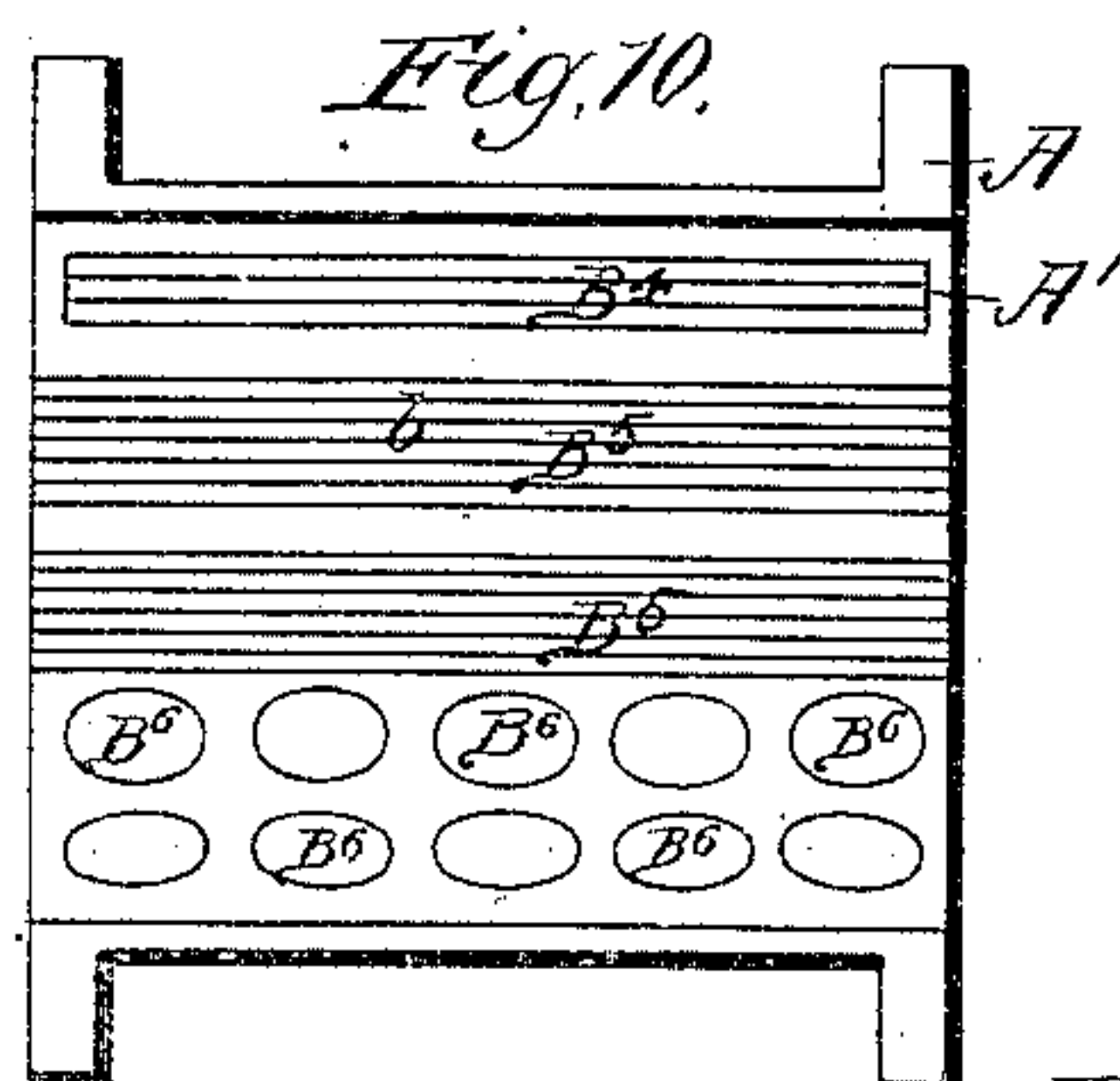
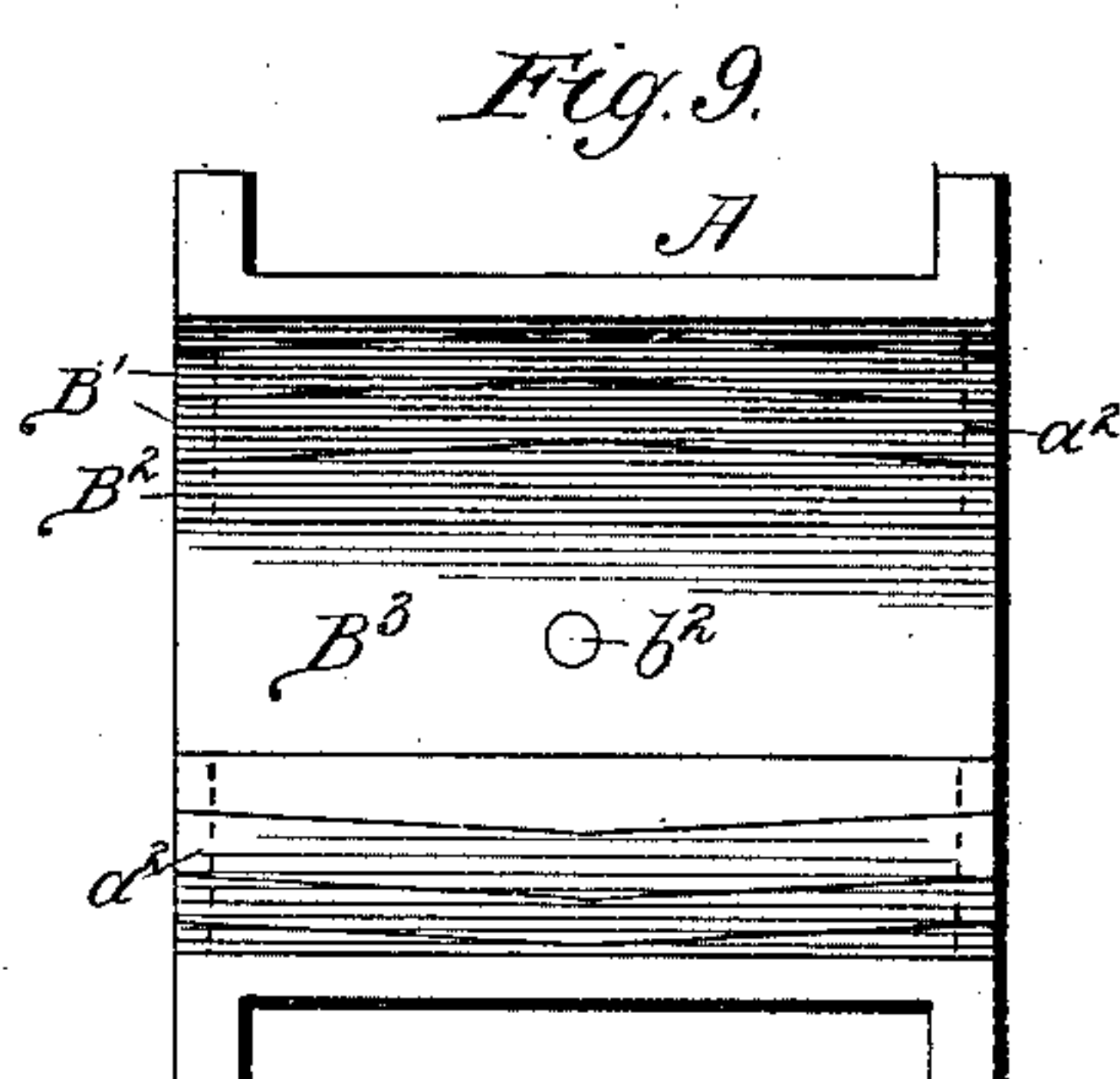
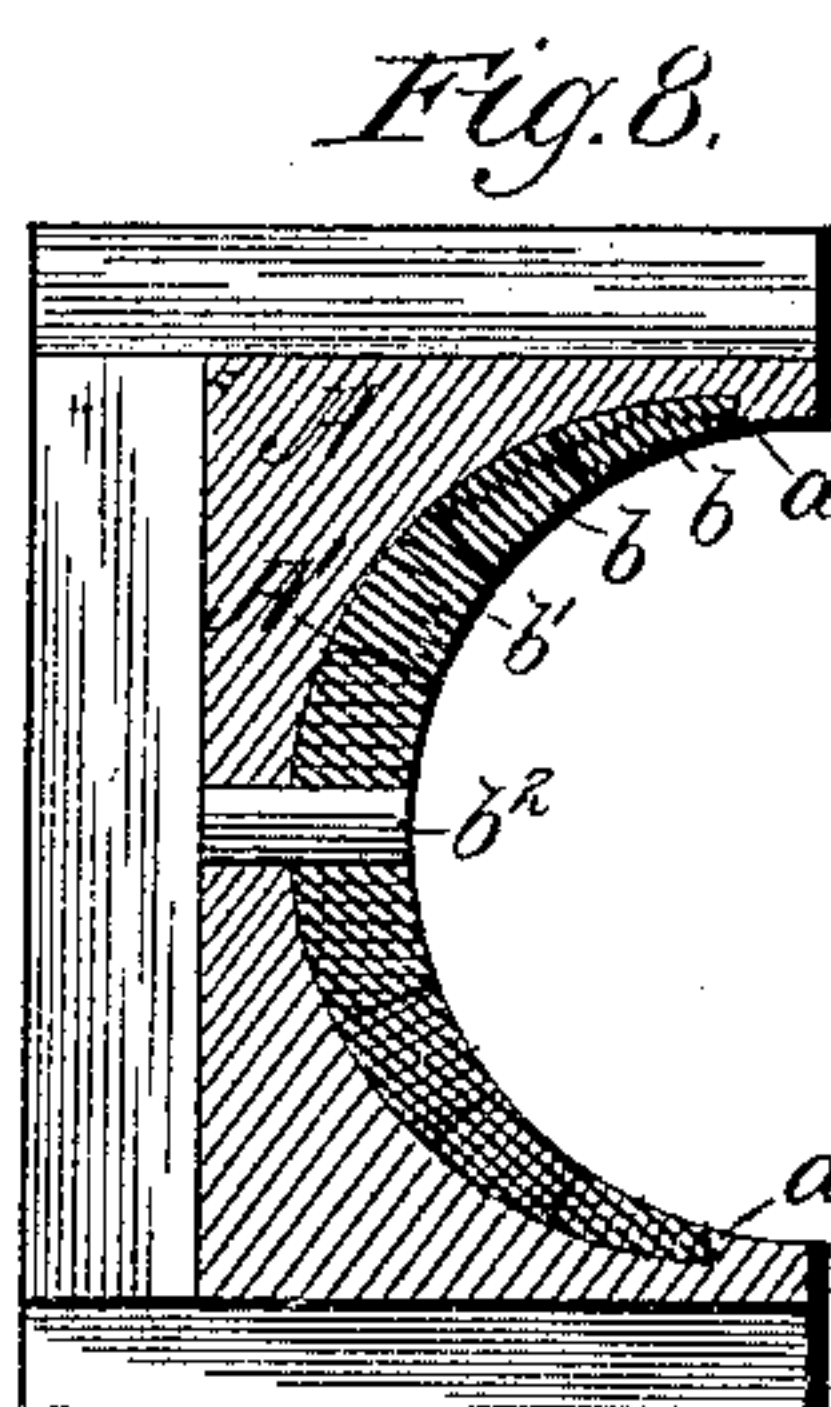
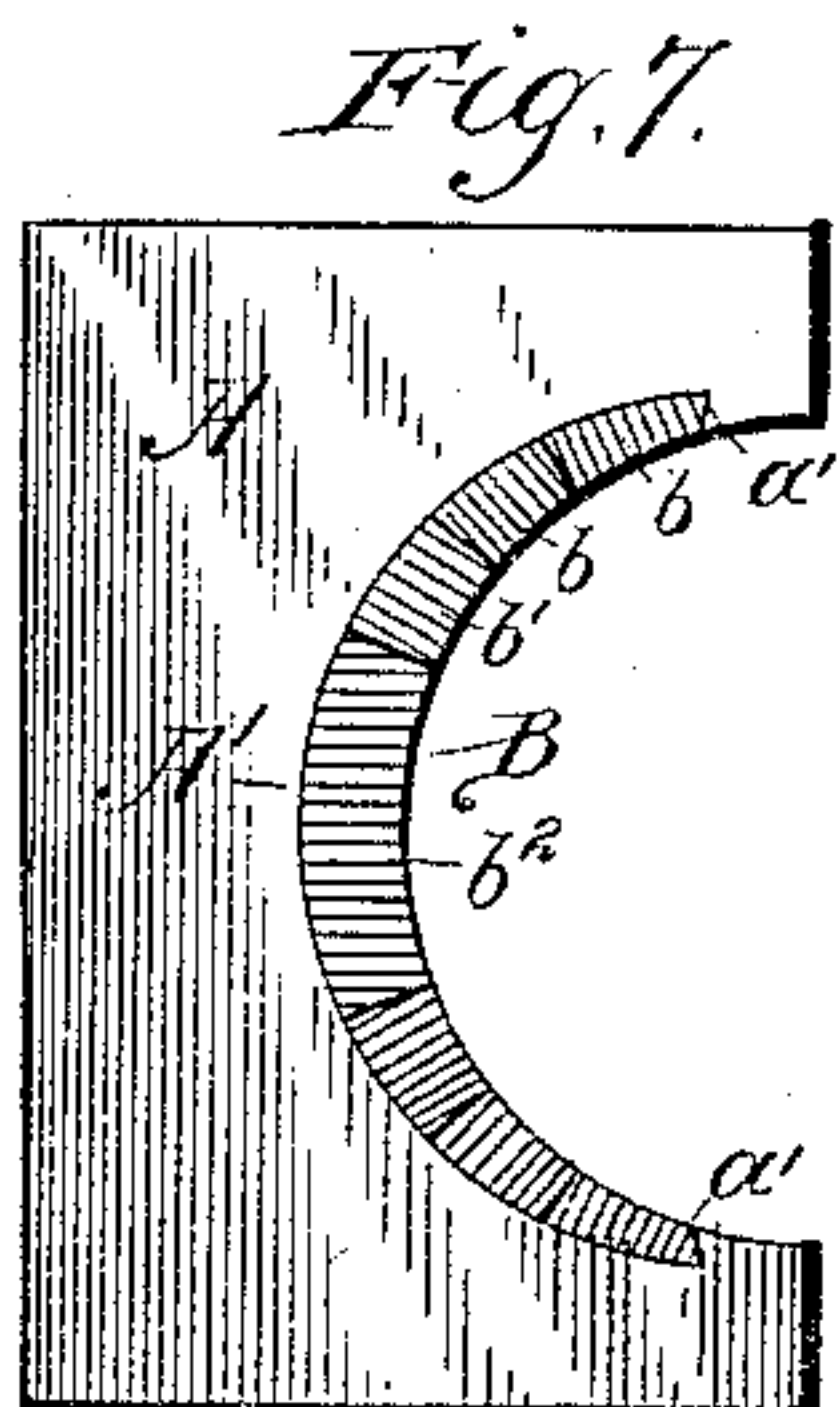
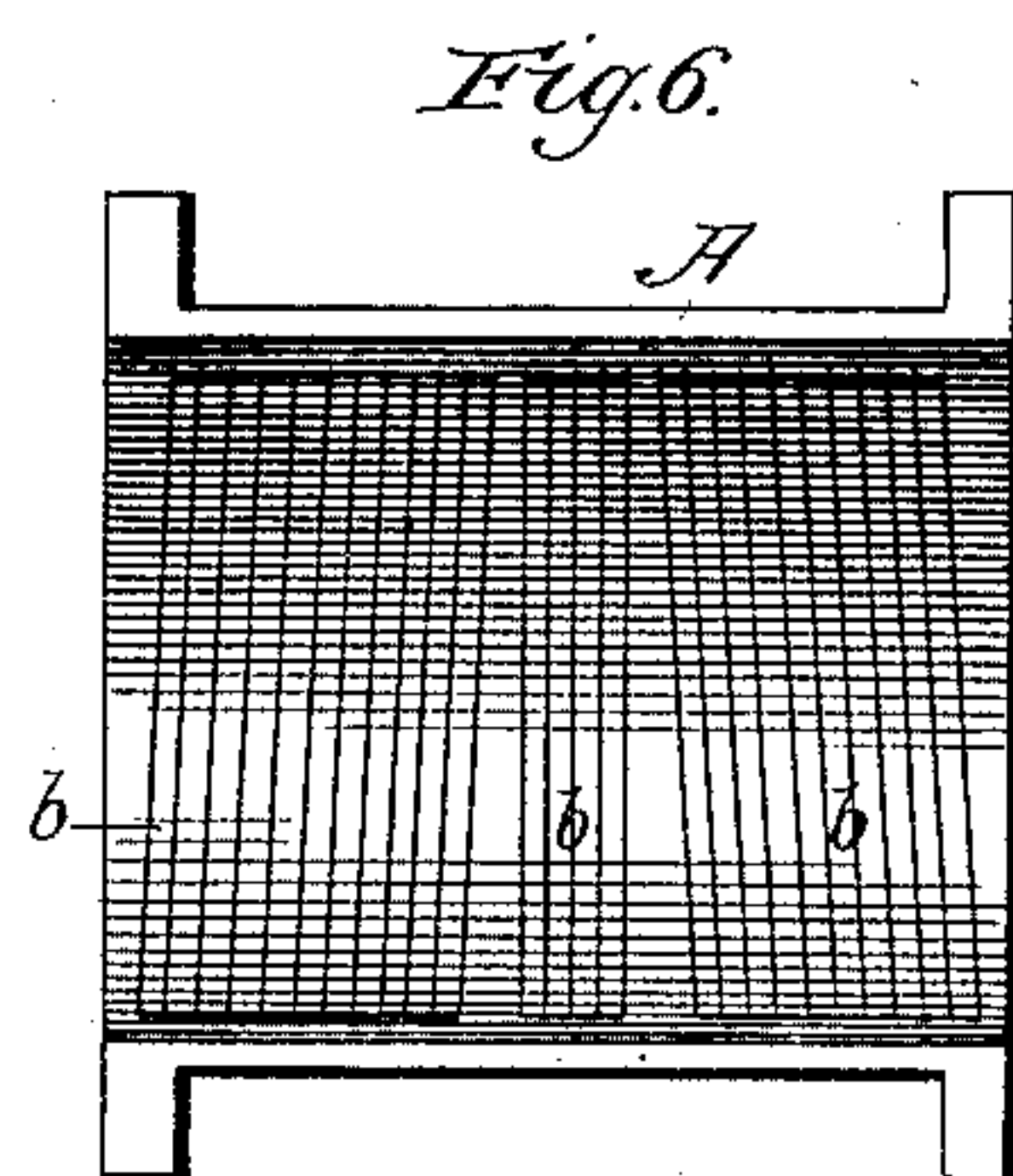
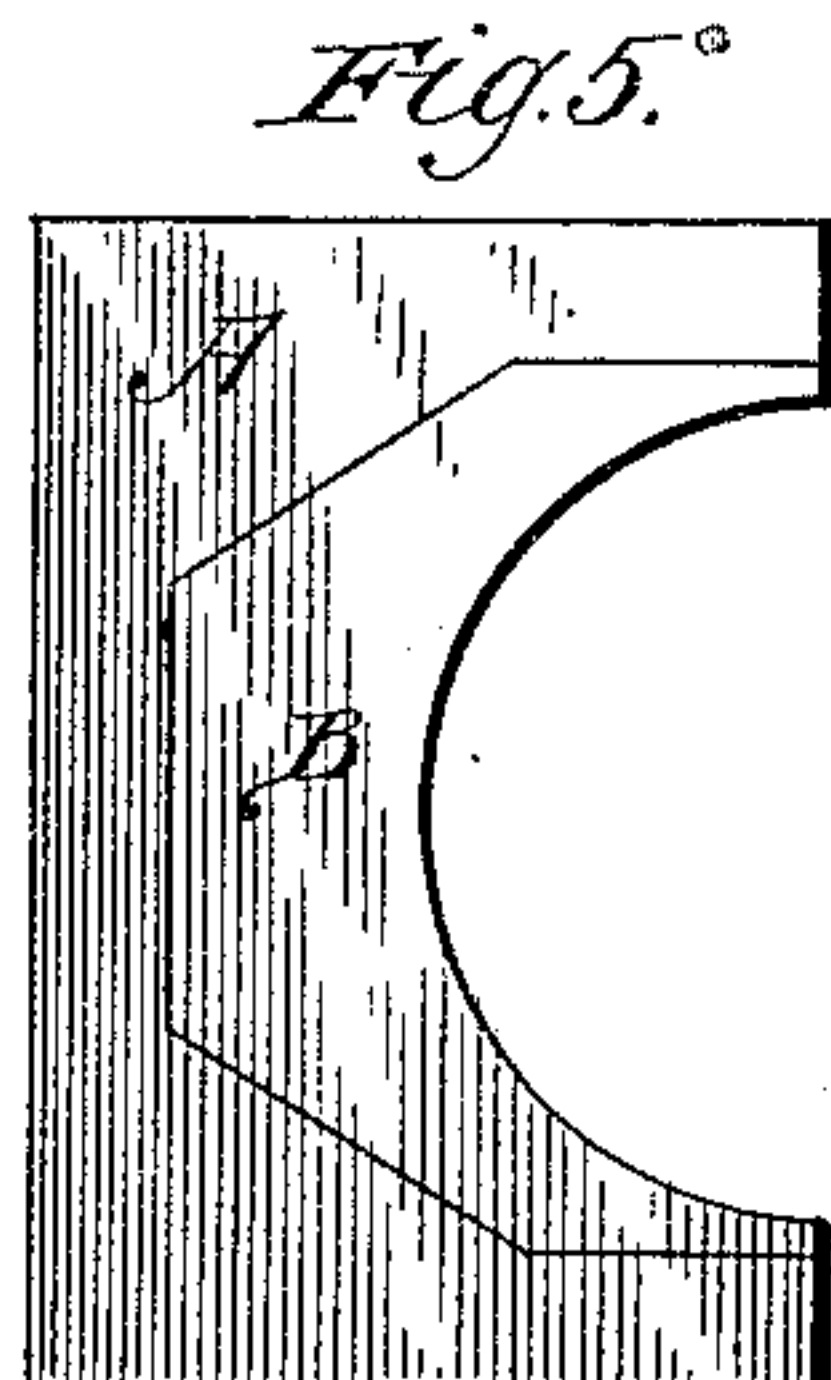
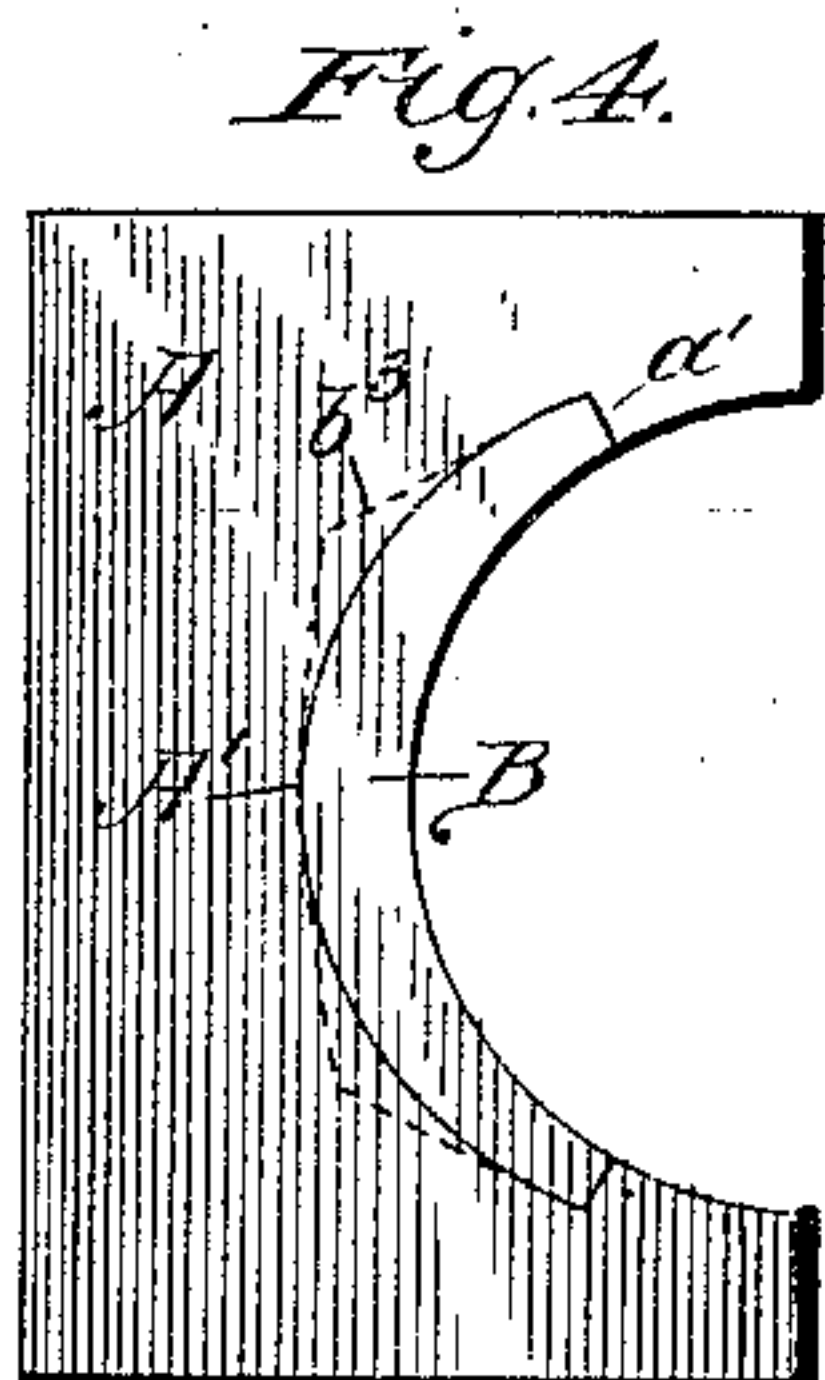
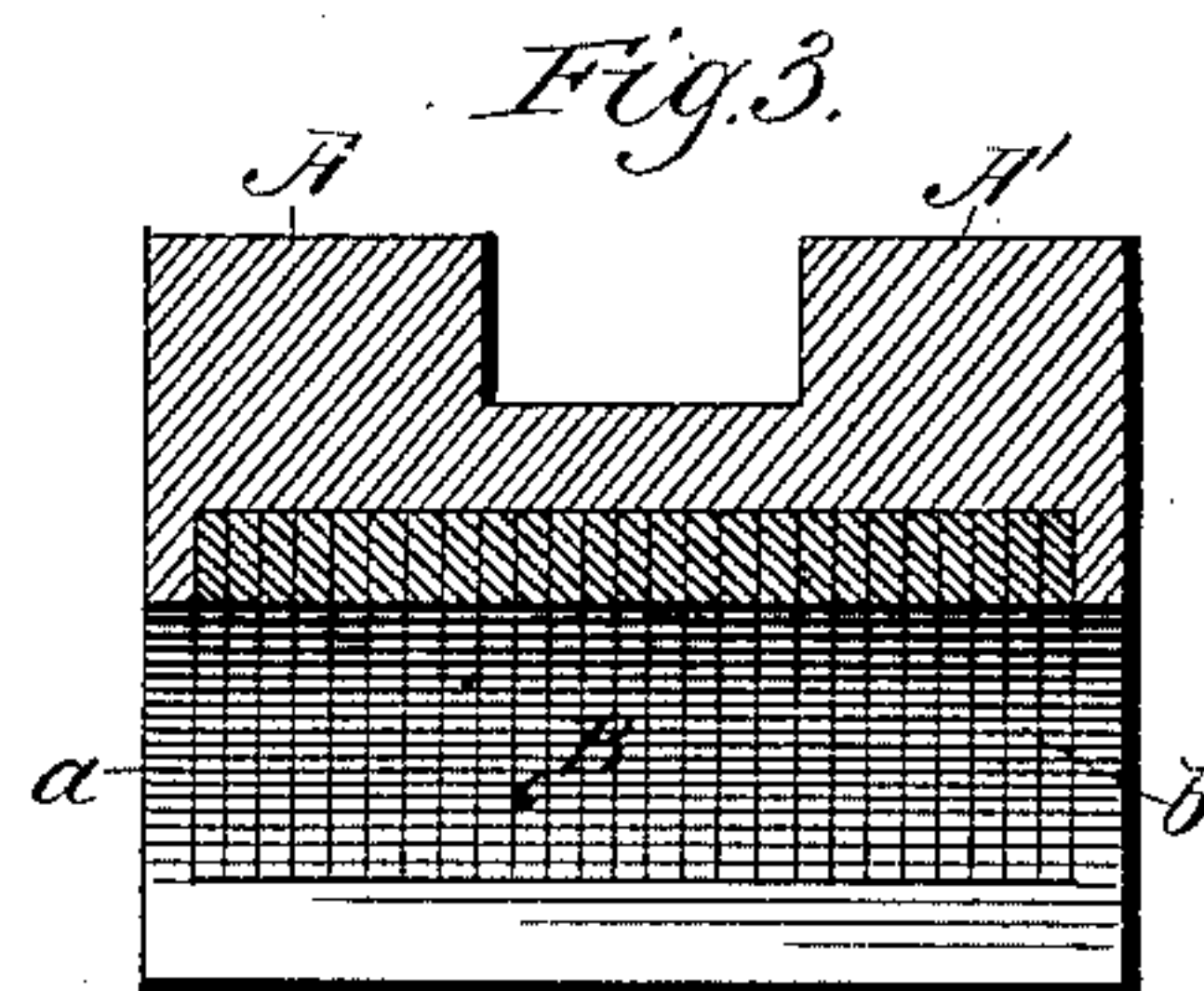
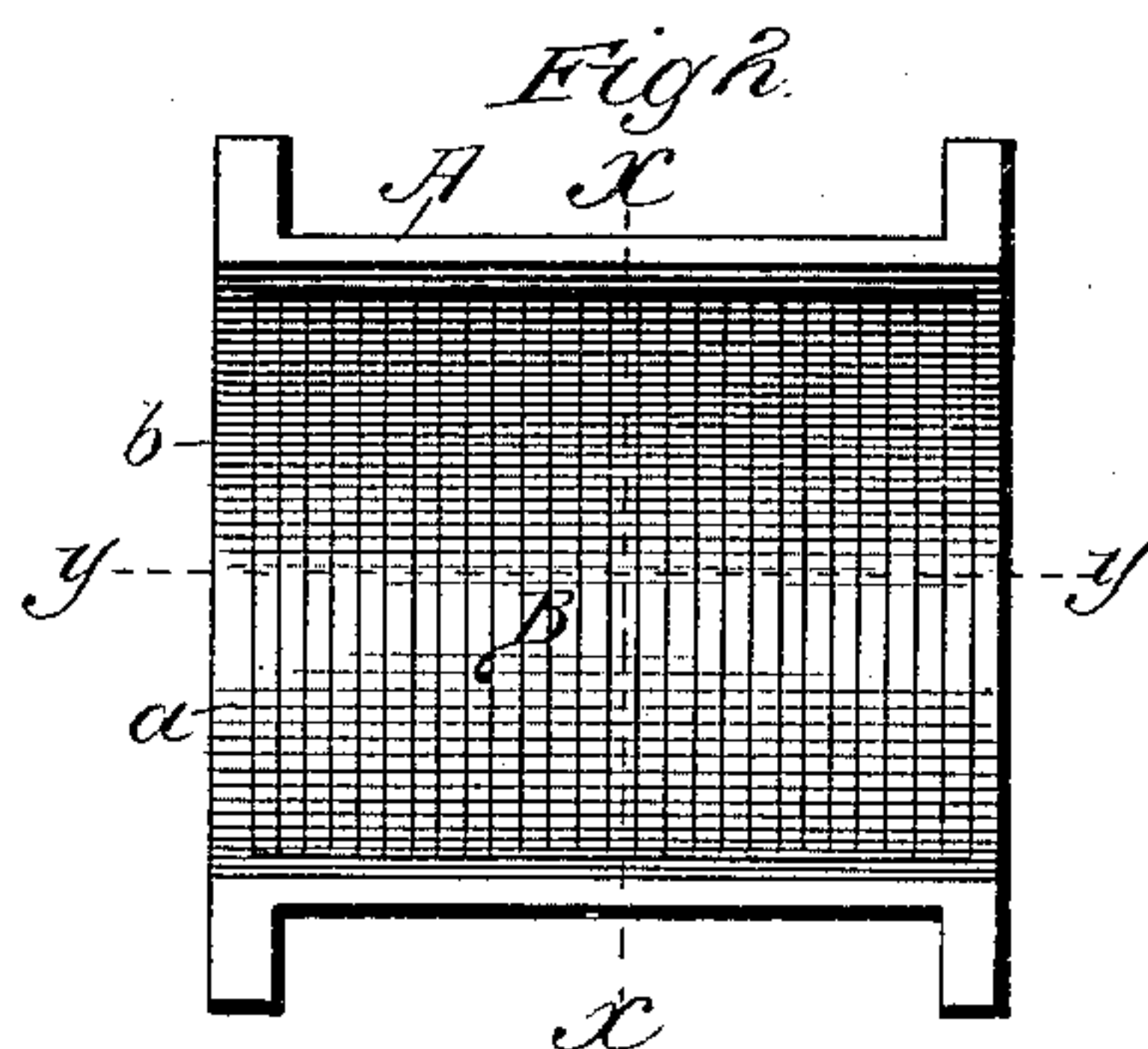
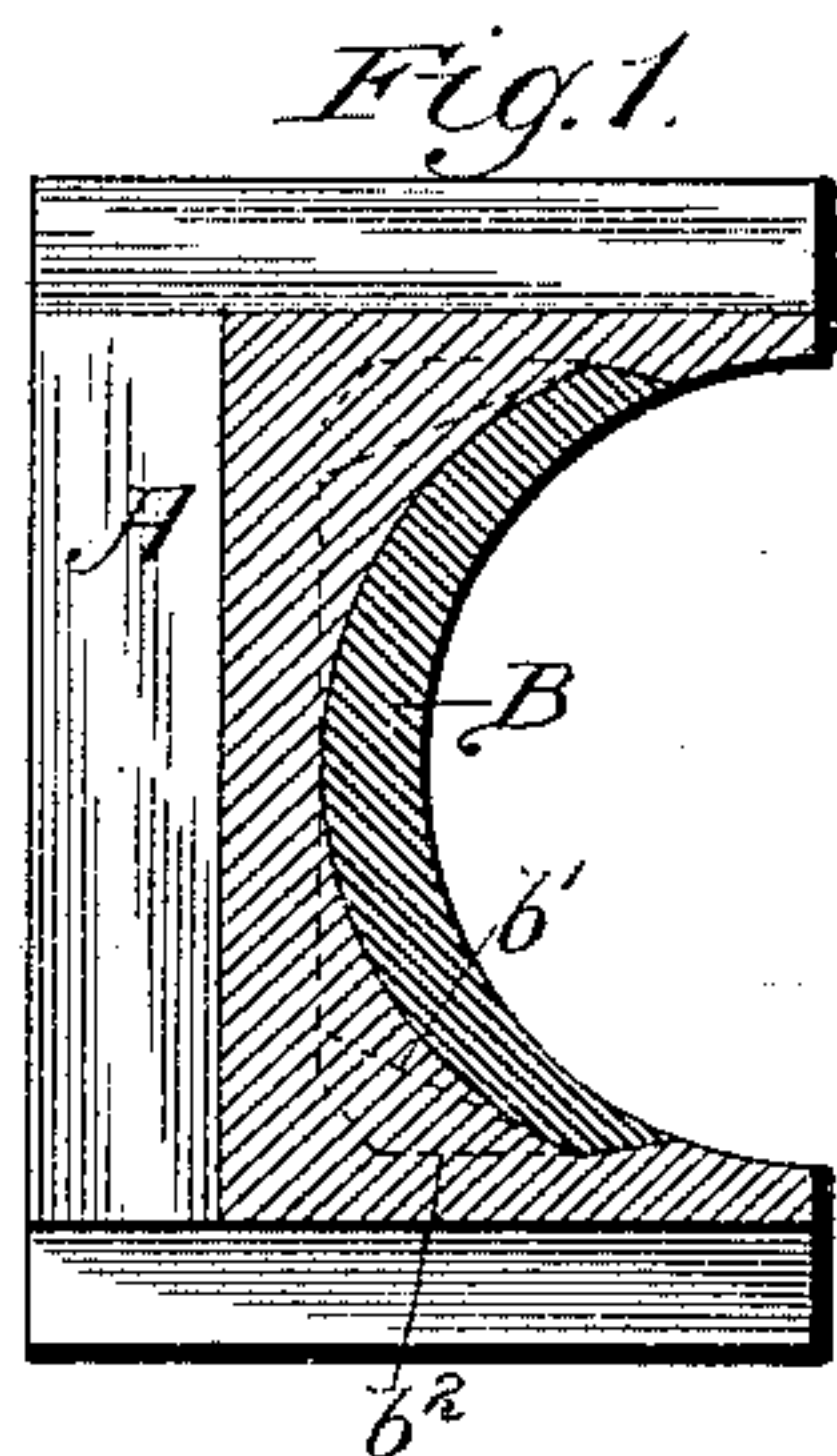


(No Model.)

F. F. SWAIN.  
JOURNAL BEARING.

No. 341,392.

Patented May 4, 1886.



Witnesses.

Will B. Quinlan

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# UNITED STATES PATENT OFFICE.

FRED. F. SWAIN, OF CHICAGO, ILLINOIS.

## JOURNAL-BEARING.

SPECIFICATION forming part of Letters Patent No. 341,392, dated May 4, 1886.

Application filed December 3, 1885. Serial No. 184,631. (No model.)

*To all whom it may concern:*

Be it known that I, FRED. F. SWAIN, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Journal-Bearings; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in journal-bearings; and it consists in the matters hereinafter described, and pointed out in the appended claims.

I have found by experiment that rawhide may be solidified or rendered compact by pressure, and that when so compressed it is capable of forming a bearing-surface which is fully as hard as the metals heretofore commonly used for bearing-surfaces, while at the same time being much more durable and less liable to heat or wear by friction.

In a bearing constructed in accordance with my invention the compressed rawhide is applied in the form of a lining to the usual bearing-box or "brass," which latter is provided upon its inner face with a suitable recess or recesses, within which the rawhide is inserted and held, the said lining being composed of a series of layers of rawhide, which are preferably arranged in such manner that the edges of the layers form the bearing-surface.

The invention may be more fully understood by reference to the accompanying drawings, in which Figure 1 is a central transverse section taken upon line  $x x$ , Fig. 2, through one of the brasses of a journal-bearing, illustrating a lining of rawhide applied thereto. Fig. 2 is an elevation showing the interior of the brass shown in Fig. 1. Fig. 3 is a longitudinal section of the said brass, taken upon line  $y y$  of Fig. 2. Figs. 4 and 5 are sectional views illustrating other forms which rawhide may take. Fig. 6 is an elevation illustrating the interior surface of a brass, showing the rawhide applied thereto in several separate circumferentially-arranged blocks. Fig. 7 is an end elevation of another form of brass, in which a series of longitudinally-arranged rawhide blocks are used. Fig. 8 is a central transverse section of the same. Fig. 9 is an elevation of the interior surface of the brass

shown in Figs. 7 and 8. Fig. 10 is a view of the interior surface of a brass, showing several different ways of applying rawhide bearing-surfaces to the interior surface of the brass.

In the several figures of the drawings, A indicates the brass, which may be of any common or preferred construction; and B is the inner lining, of compressed rawhide, fitted into a recess, A', in the inner surface of said brass.

As shown in Figs. 1, 2, and 3, the body or lining B of rawhide consists of a series of layers,  $b$ , which are compressed or compacted together under great pressure, and are arranged transversely to the brass, so that their edges are located circumferentially with reference to the journal, and form the bearing-surface in contact with the latter. The recess A' in this case is surrounded upon all sides by a rim or flange,  $a$ , upon the brass, whereby the lining is held in position and the accidental access of moisture thereto is prevented. In said Figs. 1, 2, and 3 the lining B is shown as of nearly equal thickness throughout, and as curved upon its surface which is in contact with the brass. Instead of this construction, however, the cavities A' in the brass may be of rectangular or other form in cross-section, as indicated, for instance, by the dotted lines  $b' b^2$  of Fig. 1.

In Fig. 4 the lining B is shown as extending at its ends so as to come flush with the end surface of the brass, the recesses A' in this case being made with abrupt or radially-arranged end surfaces or shoulders  $a'$ , and the rawhide lining being inserted from the end of the journal. In the said Fig. 4 the dotted lines  $b^3$  indicate another sectional form which the rawhide lining may take.

In Fig. 5 the rawhide lining B is shown as extending to the end faces of the brass, and as forming a complete semicircular bearing for the journal. This form of brass is one which may be used with another similar brass to give a continuous bearing-surface of rawhide about the journal, such as may be used for crank-pins and in other similar situations.

In the form of the device illustrated in Fig. 6, the rawhide lining is shown as formed in three separate blocks arranged circumferentially of the journal, these blocks being held in recesses formed in the inner surfaces of the brass in



the same manner as shown in Figs. 1, 2, and 3. As illustrated in said Fig. 6, the layers *b* of rawhide in the blocks, at opposite ends of the brass are arranged at a slight inclination with reference to the center line of the brass, so that any given point upon the journal will traverse the layers diagonally in the rotation of the journal, instead of remaining continually in contact with the edge of one layer only.

Figs. 7, 8, and 9 illustrate a construction in which the rawhide lining is composed of a series of radially-arranged blocks,  $B^2 B^3$ , which are composed of a series of layers, *b*, arranged radially and extending longitudinally of the brass, or parallel with the axis thereof. The said blocks, as shown in said figures, are of cross-sectional form, similar to the voussoirs or arch-stones in an arch, and are held in place within the recess *A'* by means of dovetailed shoulders *a'* at the sides of the recess, and a key-block,  $B^3$ , inserted from the end of the brass after the other blocks,  $B^2$ , have been inserted. In this case the blocks may be held from shifting endwise by the presence of inwardly-extending end flanges upon the brass, as indicated by the dotted lines *a''* in Fig. 9, or the side walls or shoulders, *a''*, of the recess may be bent or curved outwardly in their middle parts, and the block  $B^2$  correspondingly bent or curved, so that the several blocks will be interlocked with each other and with the shoulders when the key-block  $B^3$  is inserted. The said key-block, either in case the end flanges indicated by the dotted line *a''* are used, or when the blocks are bent or curved so as to interlock, will extend, as above set forth, outwardly to the end face of the brass, so that it may be inserted in place endwise. Said key-block also may be conveniently held from end movement when in place by means of a plug, *b'*, of compressed rawhide, inserted through the said block and into the brass. Instead of arranging the rawhide bearing-surface to form a bearing-surface continuous circumferentially of the brass, said blocks may be arranged in longitudinal strips or otherwise.

As is shown in Fig. 10, for instance,  $B^4$  indicates a longitudinal strip inserted in a recess formed in the inner face of the brass in the same manner described in connection with Figs. 1, 2, and 3. In said figure, also,  $B^5 B^5$  indicate two parallel blocks extending the full length of the brass, so that they may be inserted endwise in recesses in the brass. In the lower part of the said Fig. 10 the brass is shown as provided with a series of cylindric blocks,  $B^6$ , arranged in correspondingly-shaped recesses in the inner face of the brass in such manner that their flat ends form the bearing-surface for the journal.

It will be observed that in the forms of the device in which the rawhide lining is extended

to the end of the brass that the end surfaces of the lining will form either part or the whole bearing-surface for the shoulders or collars upon the shaft. This construction is of great advantage, inasmuch as it enables the collars or shoulders to be fitted closely to the brass, so as to prevent end motion in the journal, while at the same time preventing friction or wear in the said shoulders or collars.

In carrying out my invention, the rawhide may be compressed by power applied in any suitable manner, and will preferably be moistened with water containing glue in solution before being compressed, whereby it will retain its form after the pressure is removed.

I am aware that rawhide has been heretofore employed in the form of blocks or thin sheets to form journals and other bearings, but rawhide has not, as far as I am aware, been heretofore applied in the form of pieces or blocks cut from compressed rawhide and secured in a recess or recesses in a bearing-box or brass with the edges of the layers in contact with the journal in the manner above described and as set forth in the appended claims.

I claim as my invention—

1. The combination, with a metal journal-box or brass recessed upon its inner surface, of a block or blocks of compressed rawhide fitted in the recess of the brass and having the edges of the layers presented to form the bearing-surface thereof, substantially as described.

2. The combination, with a brass, *A*, provided with a recess, *A'*, having shoulders *a'*, of a rawhide lining consisting of a series of strips or blocks,  $B^2 B^2$ , and a key-block,  $B^3$ , substantially as described.

3. The combination, with a brass, *A*, provided with a recess, *A'*, having shoulders *a'*, of a lining of compressed rawhide consisting of a series of blocks,  $B^2$ , and a key-block,  $B^3$ , and a plug, *b''*, passing through the key-block into the brass, the surface of the shoulders *a'* and the contiguous sides of the blocks  $B^2$  being formed to interlock with each other, substantially as described.

4. The combination, with a brass recessed upon its inner surface, of a lining of rawhide fitted in the recess of the brass and extended at the ends of the brass to form bearing-surfaces for the shoulders or collars upon the journal, substantially as described.

In testimony that I claim the foregoing as my invention I affix my signature in presence of two witnesses.

FRED. F. SWAIN.

Witnesses:

C. CLARENCE POOLE,  
M. E. DAYTON.