

No. 845,711.

PATENTED FEB. 26, 1907.

J. A. KAPLAN.
METHOD OF PUNCHING AND BENDING PULLEY RIMS.
APPLICATION FILED FEB. 15, 1906.

FIG. 1

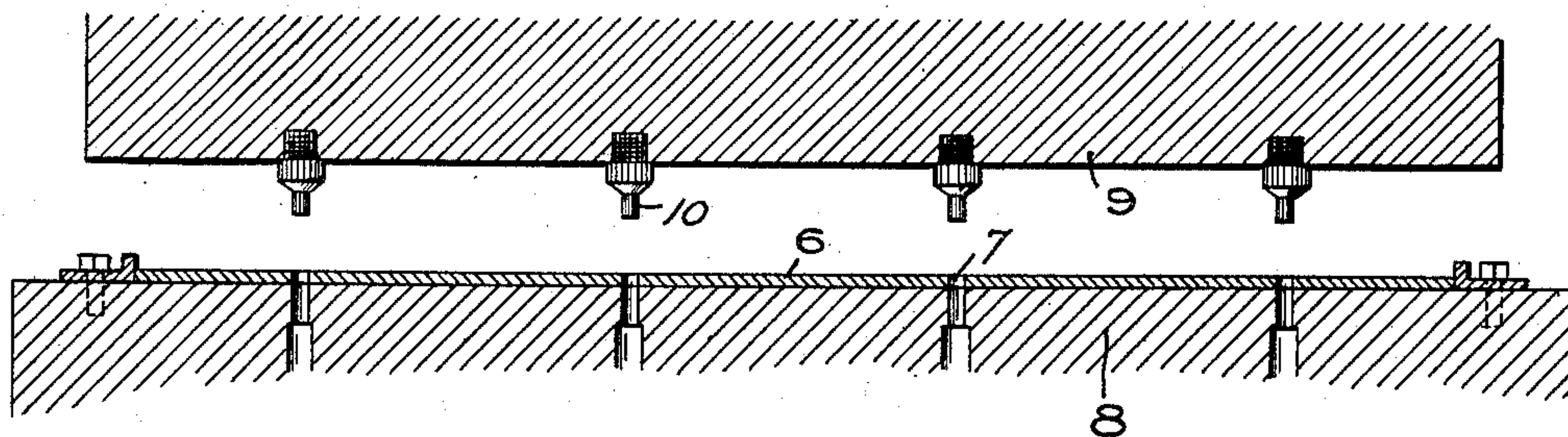


FIG. 2

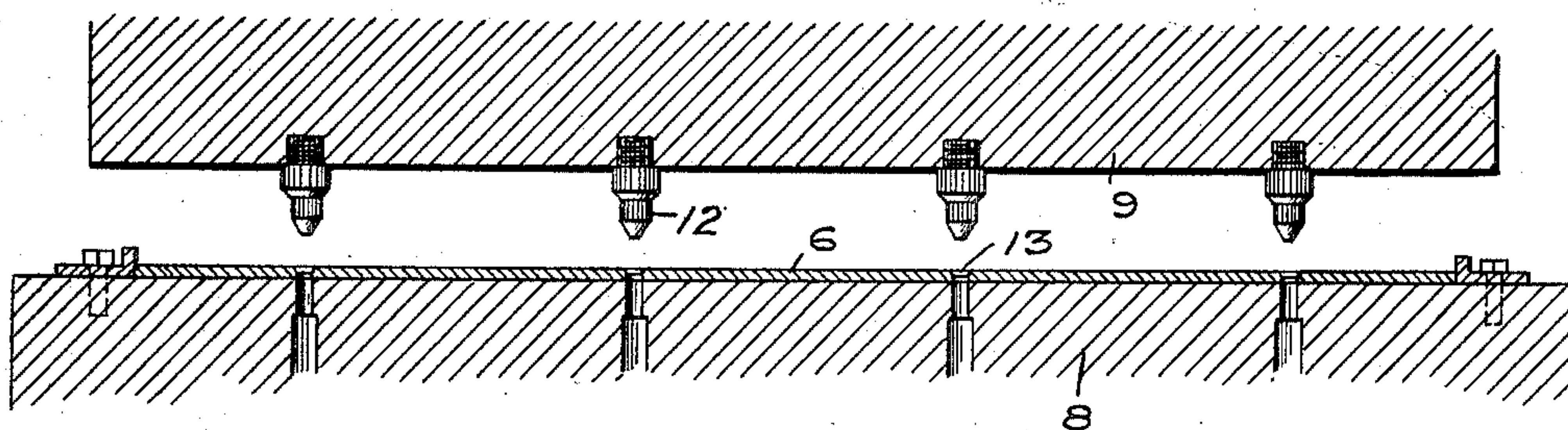


FIG. 5

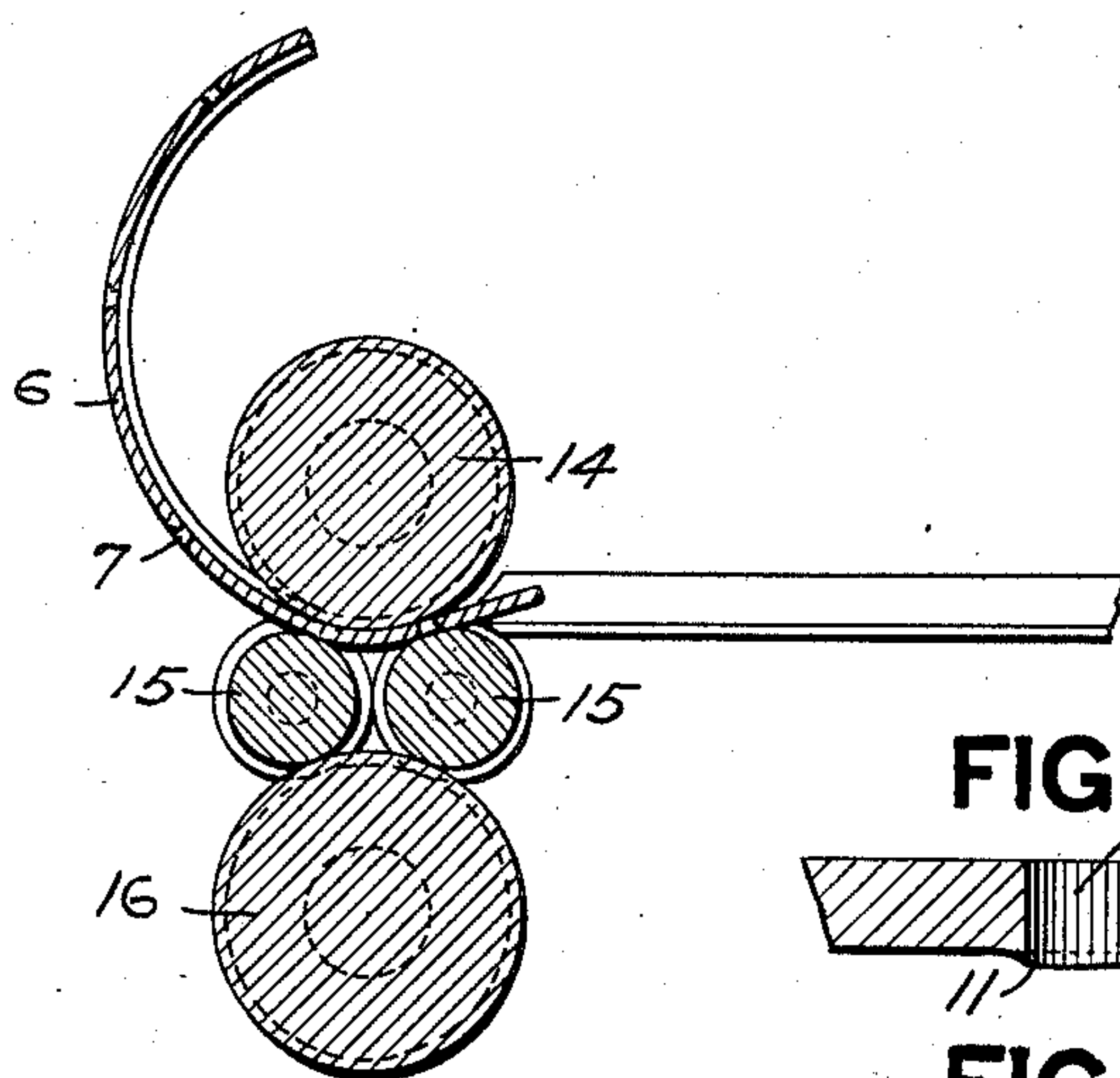


FIG. 6

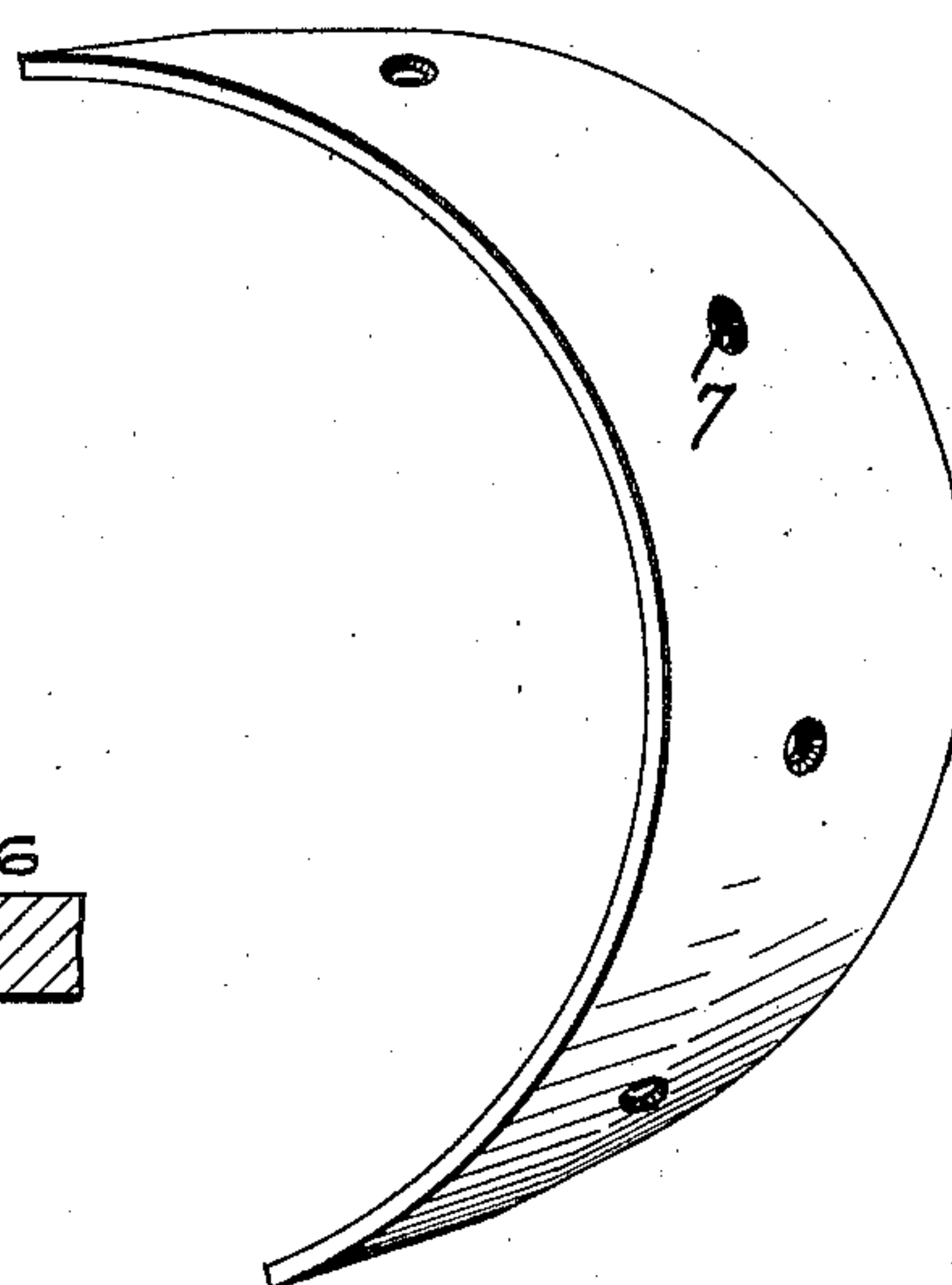
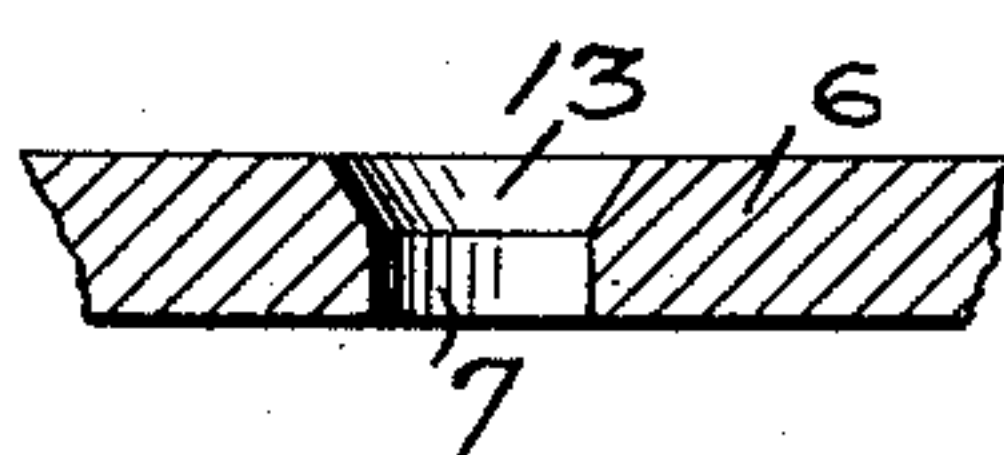


FIG. 3



FIG. 4



WITNESSES.

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METHOD OF PUNCHING AND BENDING PULLEY-RIMS.

No. 845,711.

Specification of Letters Patent.

Patented Feb. 26, 1907.

Original application filed July 10, 1905, Serial No. 269,071. Divided and this application filed February 15, 1906. Serial No. 301,208.

To all whom it may concern.

Be it known that I, JOSEPH A. KAPLAN, a resident of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Method of Punching and Bending Pulley-Rims; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to the method of making pulley-rim sections for pulleys and the like from rolled plate metal. The object is to provide for the forming of such rims with speed, accuracy, and economy.

The application is a division of my application filed July 10, 1905, Serial No. 269,071.

The invention consists, generally stated, in making these pulley-rim sections by first punching or otherwise forming the spoke-holes in the plate composing the rim-section and then countersinking the outer faces of the spoke-holes by forging pressure through the action of countersinking-punches, the preferred course being to first punch the spoke-holes and then turn the plate over and by such countersinking action both remove the fin formed by the punching and form a hard and smooth countersunk seat on the outer face.

It also consists in so forming the plate composing the rim-section and then simultaneously bending the plate into semicircular form and crowning the pulley-rim, such as by rolling the same to shape.

In the accompanying drawings, Figure 1 represents the first step in the punching of the spoke-holes in the plate and forming the rim-section. Fig. 2 illustrates the countersinking of said holes. Fig. 3 is an enlarged section illustrating the condition of the plate after punching and showing the fin formed. Fig. 4 shows the resultant action after the plate is turned over and subjected to the countersinking-punch. Fig. 5 shows the step of bending and crowning the previously punched and countersunk plate, and Fig. 6 shows the crowned pulley-rim.

The invention is illustrated in connection with the forming of rim-sections for sectional pulleys in which each rim-section constitutes one-half of the complete rim. The rim-sections are formed from metal plates 6 of the necessary gage, width, and length to form

the desired pulley-rim, being preferably cut from commercial rolled plates of the necessary gage and width. In each plate the necessary number of spoke-holes 7 are formed in any suitable way, this being done most cheaply by punching, as illustrated in Fig. 1. The plate 6 is placed upon a bed-die 8, and the reciprocating punching head or platen 9 carries a series of punches 10 of such number and so spaced apart that at a single blow of the press the necessary number of spoke-holes are formed in the plate. In this punching, as illustrated in Fig. 3, fins or ragged edges are formed around the punched holes on the opposite side of the plate, as at 11. The metal is also left slightly ragged or porous at this point.

By means of the next step of the method I am enabled to not only form the countersinks or seats on the outer face of the pulley-rim, but to entirely remove these finned, ragged, or porous edges around the spoke-holes. To this end the plate is then turned over, so as to bring upward the face of the plate which forms the outer face of the rim-section, and the punched holes are then subjected to the forging action of the countersinking-punches 12, as shown in Fig. 2. These punches may, if desired, be attached to the platen or head 9 of the press which carries the punches 10, and the plate may rest upon the same bed-die 8, it being necessary simply to turn over the plate upon that die and bring its punched holes in line with the countersinking punches or dies 12, as shown in Fig. 2. As the platen of the press descends these countersinking punches or dies are forced into the spoke-holes and by a forging pressure force down the metal and forge the tapered countersinks, such as that shown at 13 in Fig. 4, forming very hard smooth countersunk seats by a simple quick stroke of the press. In so doing in case the spoke-holes have been punched, as above described, such countersinking strokes also obliterate all fins, ragged, or porous portions formed around the edge of the hole by the punching action; and this provides a very rapid and cheap means for producing the punched and countersunk plate ready for bending into pulley-rim or like sections. In the rapid finishing of these pulleys I prefer at one operation to both bend the pulley-sections into semicircular form and

crown the same, producing at one operation the finished crowned pulley-section from the previously punched and countersunk plate. For this purpose I prefer to employ the rolls shown in Fig. 5, comprising the bending-roll 14, a pair of anvil-rolls 15, which are made of comparatively small diameter to form two points of support for the plate very close to each other and which are backed and stiffened by the bottom roll 16. As illustrated in the drawings, in order to crown the plate as well as bend it the upper bending-roll 14 is formed slightly convex, while the anvil-rolls 15 are formed slightly concave, corresponding to the desired crown to be imparted to the plate during bending. The rolls of course are arranged to be adjusted to suit the desired diameter of pulley-rim to be produced, it being found that by the adjustment of rolls of this character I am able to roll pulley-rims to accurate curve and of practically any diameter. This bending operation is performed cold, so that the finished pulley-rim will not shrink or warp and will remain of the same true semicircular shape and of the exact diameter for the production of which the bending-rolls are adjusted. In this bending operation it will be seen that the bending pressure is applied in such way that instead of closing up or distorting the countersunk

outer faces of the spoke-holes formed in the pulley-rim it stretches the same in all directions, and so while slightly enlarging such countersinks preserves them of proper form, even though the blank is bent as shown after such countersinking action.

What I claim is—

1. The herein-described steps in the manufacture of pulley-rim sections and like articles, consisting in first punching spoke-holes in the plate composing the rim-section, and then turning the plate over, and countersinking the outer face of the spoke-holes by forging pressure by the action of countersinking-punches.

2. The herein-described steps in the manufacture of pulley-rim sections and like articles, consisting in first forming spoke-holes in the plate composing the pulley-rim section, countersinking the outer faces of the spoke-holes by forging pressure through the action of countersinking-punches, and then simultaneously bending the plate into curved form and crowning the pulley-rim.

In testimony whereof I, the said JOSEPH A. KAPLAN, have hereunto set my hand.

JOSEPH A. KAPLAN.

Witnesses:

ROBERT C. TOTTEN,
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