

No. 611,696.

Patented Oct. 4, 1898.

R. W. LUNDY.

MEANS FOR STRAIGHTENING AND COOLING BARS.

(Application filed Nov. 26, 1897.)

(No Model.)

Fig. 1.

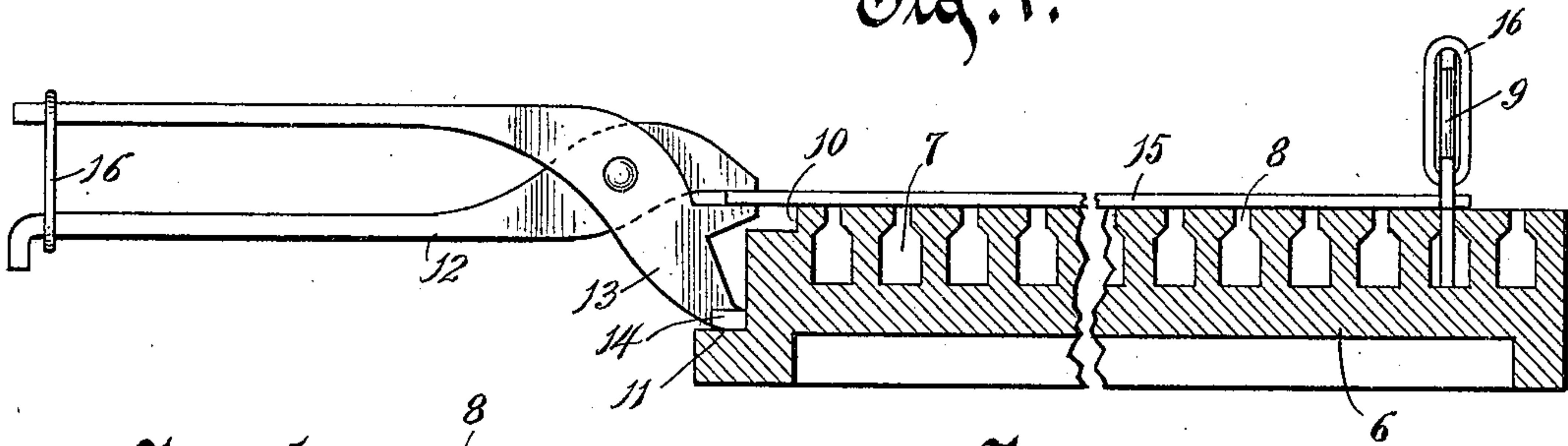


Fig. 5.

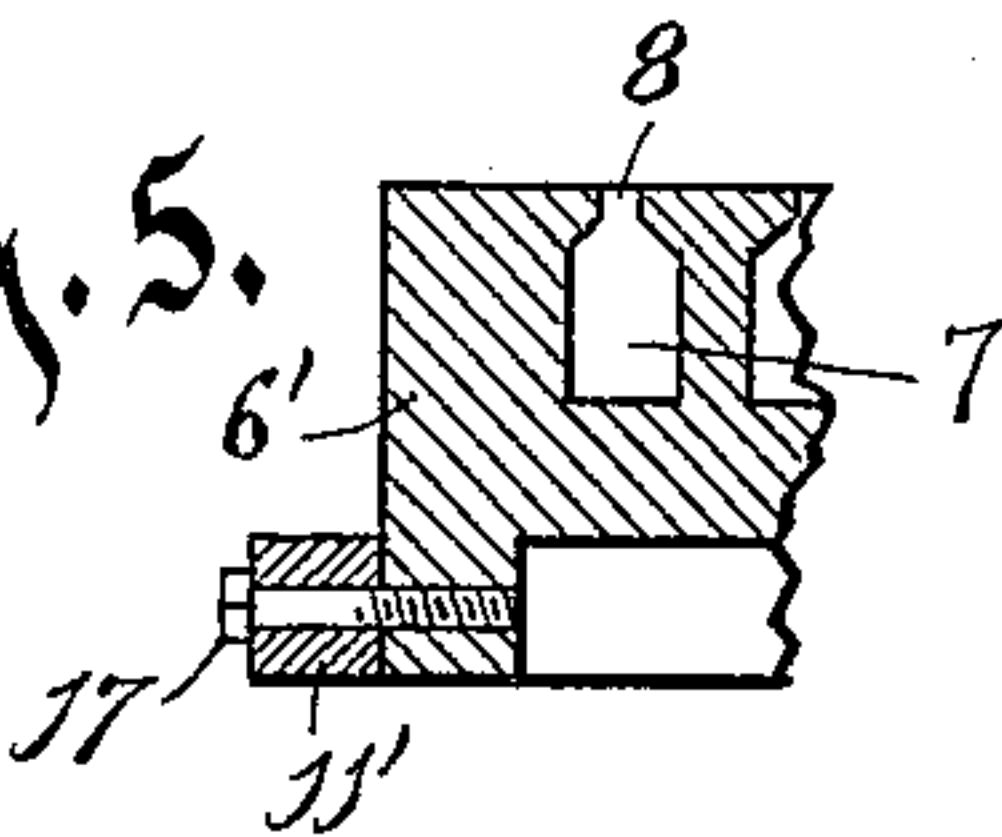


Fig. 2.

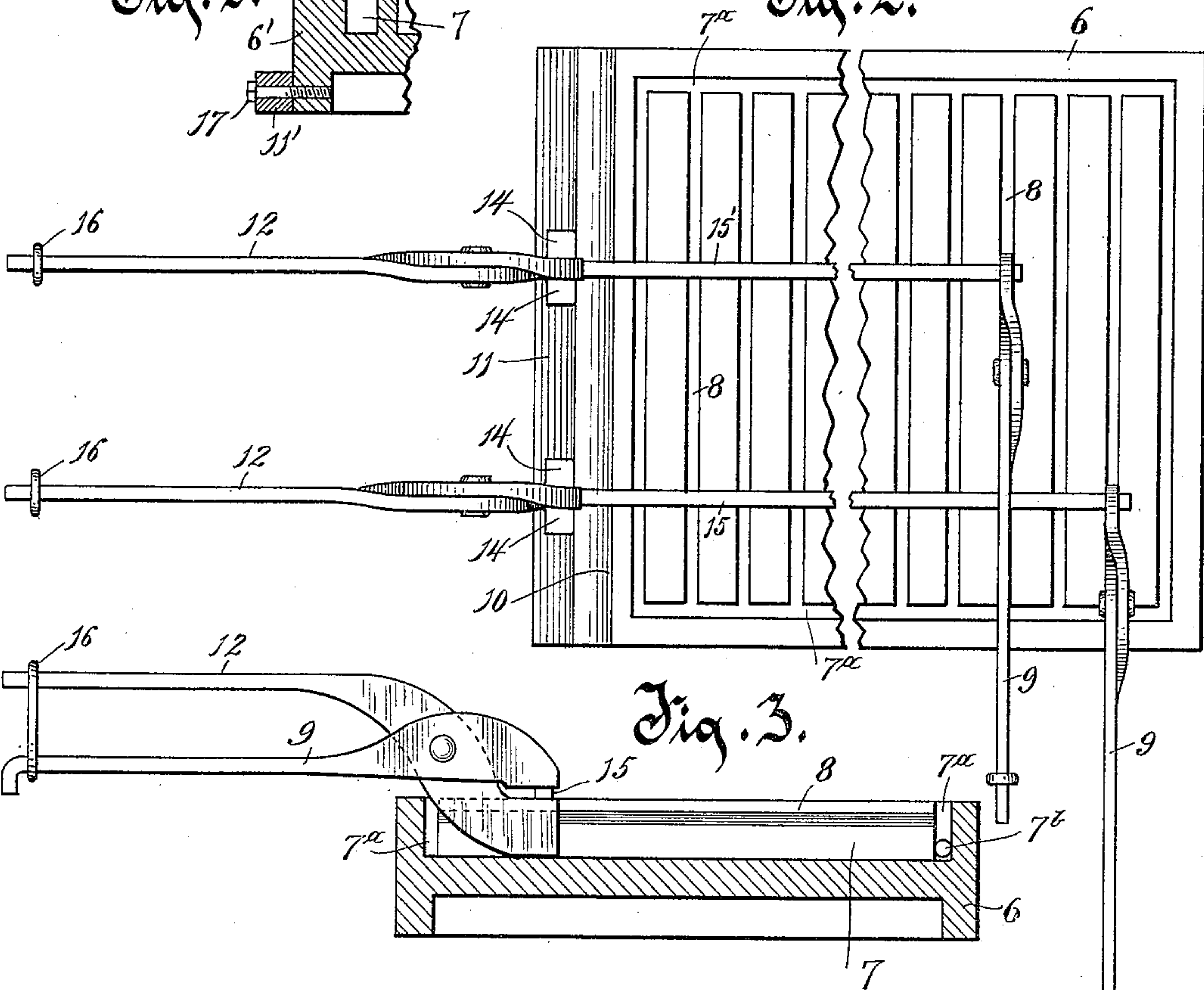


Fig. 3.

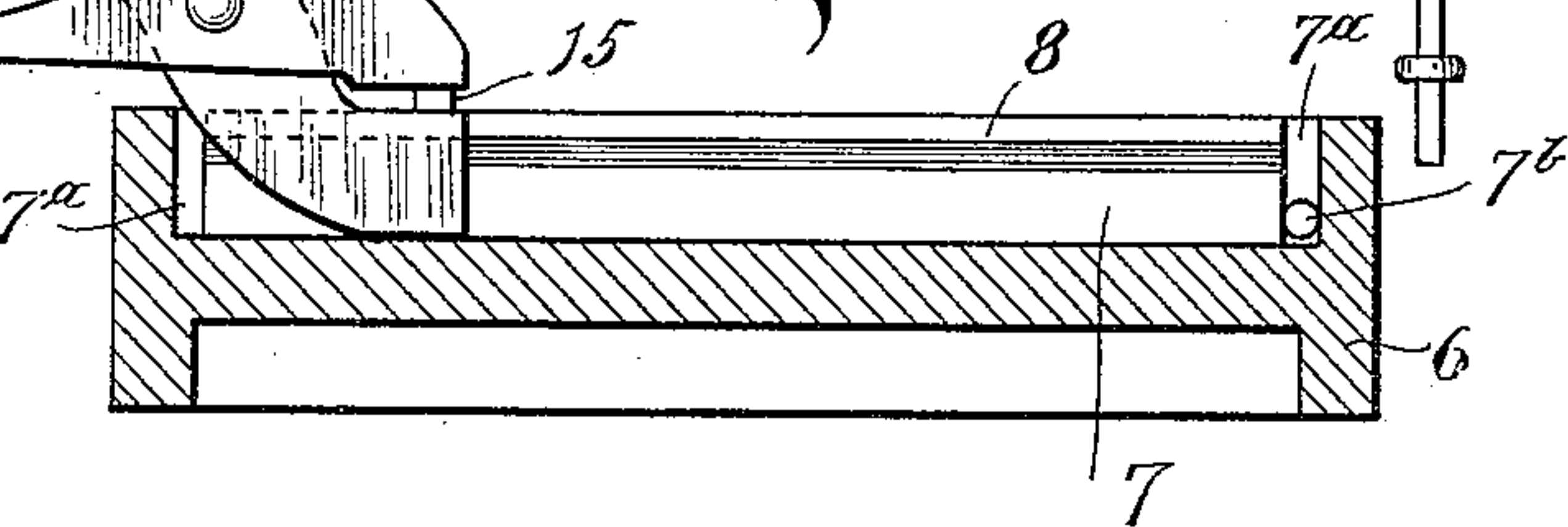
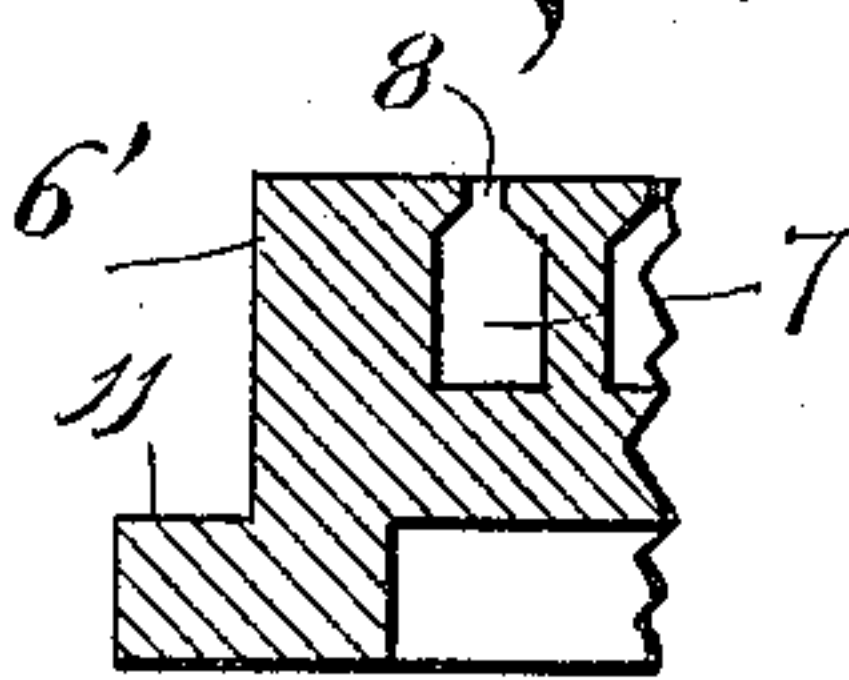


Fig. 4.



Witnesses:

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UNITED STATES PATENT OFFICE.

RICHARD W. LUNDY, OF SOUTH BEND, INDIANA.

MEANS FOR STRAIGHTENING AND COOLING BARS.

SPECIFICATION forming part of Letters Patent No. 611,696, dated October 4, 1898.

Application filed November 26, 1897. Serial No. 659,828. (No model.)

To all whom it may concern:

Be it known that I, RICHARD W. LUNDY, of South Bend, in the county of St. Joseph and State of Indiana, have invented new and useful Improvements in Means for Straightening and Cooling Bars, of which the following is a description, reference being had to the accompanying drawings, which are a part of this specification.

My invention has relation to improvements in means for straightening and cooling bars.

The object is to provide an improved means for straightening bars of iron, steel, and similar material by stretching, the invention being more especially adapted for straightening small bars, which are more readily susceptible of being stretched than heavy or large bars.

Incidentally the invention comprehends as an object the employment of a bed adapted to permit of the stretching of the bars thereon and for the subsequent cooling of said bars thereon.

Further, the invention contemplates a construction of bed which is adapted for stretching bars of unequal lengths.

With the above and other incidental objects in view the invention consists of the devices and parts or their equivalents, as hereinafter more fully set forth.

In the accompanying drawings, Figure 1 illustrates a longitudinal section through the bed, said bed being broken away centrally and showing the gripping-tongs at one end thereof for stretching the bars and another tongs adapted to be applied to the bed in a manner to hold one end of the bar to be stretched. Fig. 2 is a plan view of Fig. 1, showing two bars of unequal length on the bed and the stretching and holding tongs applied thereto. Fig. 3 is a cross-section through the bed, showing the holding-tongs properly applied thereto. Fig. 4 is a fragmentary sectional view of one end of a slightly-modified form of bed, and Fig. 5 is a similar view of another slightly-modified form of bed.

Referring to the drawings, the numeral 6 indicates the stretching and cooling bed. This bed is provided with a series of waterways 7, which waterways are in communication with each other at opposite sides of the bed by means of passage-ways 7^a 7^b through

the walls which separate the waterways from each other. Water is supplied at one end through an inlet-opening 7^b and after circulating through the waterways is discharged at the opposite end of the bed. By the provision of these waterways and connecting-passages water is conveyed to all parts of the bed which come in contact with the hot bars placed upon the bed, and said bed is thereby kept comparatively cool. The bed is also provided with narrow slits or spaces 8 8, which extend from the top surface downwardly to the waterways 7. These spaces permit expansion and at the same time prevent warping, which occurs when one side of a solid plate is constantly kept at a higher degree of heat than the other.

The features thus far described are also found in the straightener-bed shown and described in my two pending applications for patents filed October 13, 1897, and one bearing the Serial No. 655,073 and entitled "Improvements in machines for straightening and cooling bars of iron, steel, &c.," and the other bearing Serial No. 655,074 and entitled "Improvements in straightening-machines." In the present invention, however, the ways 7 are not only used for the circulation of water, but also, in conjunction with the slits or spaces 8, serve to permit of the application to and retention of suitable holding-tongs 9 or other suitable holding device. The tongs 9 are of such form of construction as to adapt the lower jaw thereof to enter any of the slits or spaces 8 and to seat itself in the bottom of a waterway 7, as most clearly shown in Fig. 3.

In the form of bed illustrated in Figs. 1 and 2 one edge thereof is shown as provided in its upper portion longitudinally with a cut-away portion 10, and the lower portion of said edge is shown as provided longitudinally with a shoulder 11.

The numeral 12 indicates the stretching-tongs. Each of these tongs is provided with a downwardly-extending lug 13, which is adapted to rest upon the base-shoulder 11 and to fulcrum on the end of the bed. The lug 13 is also advisably formed at its lower end with laterally-projecting ears 14 14, which rest on the base-shoulder and prevent the tongs from sidewise tilting.

The numerals 15 15' indicate two bars to be

stretched, the bar 15' being shown as of less length than the bar 15. These bars are placed upon the bed while said bars are in a heated state. After being so arranged the holding-tongs 9 are first applied to the bed, as shown and previously explained, and the jaws thereof made to firmly engage the ends of the bars. The stretching-tongs 12 are next adjusted to place, so that the lugs 13 thereof will rest upon the base-shoulder and be fulcrumed on the end of the bed. The tongs are then raised to an angle—say forty-five degrees—and the jaws thereof made to engage the ends of the bars which project beyond the surface of the bed, and said tongs are then forced down to a horizontal position, the bar or rod being by this operation pulled and stretched absolutely straight. It will be seen that the base-shoulder 11 is so positioned that when the stretching-tongs are brought to a horizontal position the upper side of the lower jaws thereof, as well as the lower side or surface of the bar when straightened, are on a plane with the upper surface of the bed.

It will of course be understood that both the holding-tongs and the stretching-tongs are supported in the horizontal position shown by any suitable means. The jaws are also held in engagement with the bars by means of rings 16, engaging the handles of the tongs. As the bars, which are made in special or peculiar shapes, are inclined to warp while cooling, it will be obvious that as the bars are held tightly at opposite ends by the tongs, the engagement being made while said bars are in a heated state and the engagement continuing during the cooling process and contracting of the bars, said bars are thereby prevented from warping and kept straight throughout their lengths. The stretching and straightening is accomplished when the stretching-tongs are first made to engage the protruding ends of the bars, said tongs being then turned downwardly, the lug 13 thereof turning on the base-shoulder and the end of the base serving as a fulcrum. The upper cut-away portion 10 is advisably provided so as to admit of the jaws of the tongs extending inwardly to firmly grasp the protruding ends of the bars. This cut-away portion, however, is not absolutely necessary, and in the modified forms of construction shown in Figs. 4 and 5, in which the bed is indicated by the numeral 6', said cut-away portion is omitted. Fig. 5 also shows the base-shoulder as separate from the bed proper instead of integral therewith, as in the other figures, the shoulder being merely a block 11', which is held to the base by means of a bolt 17. While Fig. 5 shows the bolt 17 for connecting the block, it is obvious that said bolt could be omitted and the block merely placed against the end of the bed without any securing means. In fact, if desired, the shoulder 11 or the block 11' could be omitted altogether and the lug 13 of the stretching-tongs

prolonged so as to contact directly with the ground or surface on which the bed lies.

By providing a bed of the construction herein shown and described for stretching small bars it is evident that any number of bars of unequal lengths may be applied to the bed and successfully stretched thereon, inasmuch as the ways 7 and slits 8, leading thereto, admit of the adjustment of the holding-tongs at different portions of the length of the bed. The side walls of the ways and slits also prevent the tongs from being pulled laterally, and hence hold the same in firm engagement with the bed. The ways 7 and slits 8 also provide a means whereby the lower jaw of the holding-tongs 9 or other holding device may be engaged with the under surface of the bar on a plane with the upper surface of the bed, by which means the bar is permitted to rest upon the straight and level face of the bed and cool absolutely straight.

In the present methods and means for stretching metal bars the labor incident thereto is very great and to a large extent manual and dependent upon the accuracy of the eye of the workman. These difficulties my invention successfully overcomes. The bars are pulled straight on the straight and level surface of the bed and remain on the same bed until cooled. In the only method which has been used for straightening long hot bars and rods by the process of pulling and stretching the bar or rod is first engaged by a pulling-machine, is pulled straight, and then taken out of the machine and conveyed to a bed to cool, the handling of the bar after being straightened and while yet hot resulting in destroying to a greater or less degree the work of the pulling-machine. The process referred to has also proven to be expensive and altogether too slow to handle the product of quick-working mills, while with my improvement light bars and rods of any length rolled or drawn can be straightened more quickly than the speediest mills can finish them.

I do not wish to confine the scope of my invention to the use of tongs as a means for holding the bars at either end of the bed, as there are various means for holding that could be adopted and substituted for tongs 9 to hold the bars while being stretched and which could be used also for holding the bars at the other end instead of tongs 12 after the bar has been stretched—as, for instance, a bar raised slightly above the bed and fixed rigidly thereto at its sides and provided along its entire length with screws which could be run down to engage the bars, or screw-clamps adapted to be inserted into the slits 8, or dog-clamps likewise adapted.

What I claim as my invention is—

1. In means for straightening bars, the combination, of a bed provided with one or more communicating slits or spaces thereacross, said bed adapted to receive a heated bar thereon, and the communicating slits adapted for

the passage therethrough of a cooling medium, a holding device adapted to be adjusted to one of the slits or spaces and to engage the bar, and a stretching device adapted to engage the other end of the bar and stretch the same.

2. In means for straightening bars, the combination, of a bed provided with one or more communicating slits or spaces thereacross, said bed adapted to receive a heated bar thereon, and the communicating slits adapted for the passage therethrough of a cooling medium, a holding-tongs adapted to be applied to one of the slits or spaces and the jaws of said tongs to engage the bar, and a stretching-tongs applied to the end of the bed and adapted to engage the end of the bar and to stretch the same.

3. In means for straightening bars, the combination, of a bed provided with one or more communicating slits or spaces thereacross, said bed adapted to receive a heated bar thereon, and the communicating slits adapted for the passage therethrough of a cooling medium, a holding device adapted to be applied to one of the slits and to engage the bar, and a stretching-tongs having a lug projecting downwardly from the lower jaw thereof and resting upon a suitable base or support, said tongs adapted to engage the end of the bar and stretch the same.

4. In means for straightening bars, the combination, of a bed provided with one or more communicating slits thereacross, said bed adapted to receive a heated bar thereon, and the communicating slits adapted for the passage therethrough of a cooling medium, a holding device adapted to be applied to one of the slits and to engage the bar, and a stretching-tongs provided with horizontal jaws, the lower jaw having a lug projecting downwardly therefrom and resting upon a suitable base or support, said lug formed or provided with a laterally-extending lug or lugs to prevent sidewise tilting of the tongs, and the jaws of said tongs adapted to engage the end of the bar and stretch the same.

5. In means for straightening bars, the combination, of a bed provided with one or more communicating slits or spaces thereacross,

and formed or provided at one end with a base-shoulder, said bed adapted to receive a heated bar thereon, and the communicating slits of the bed adapted for the passage therethrough of a cooling medium, a holding device adapted to be applied to one of the slits or spaces and to engage the bar, and a stretching-tongs having a lug projecting downwardly from the lower edge thereof and resting upon the base-shoulder of the bed, said tongs adapted to engage the end of the bar and stretch the same.

6. In means for straightening bars, the combination, of a bed provided with one or more communicating slits or spaces thereacross, and formed at the upper portion of one end with a cut-away or recess, said bed adapted to receive a heated bar thereon, and the communicating slits adapted for the passage therethrough of a cooling medium, a holding device adapted to be applied to one of the slits or spaces and to engage the bar, and a stretching-tongs adapted to have the jaws thereof enter the recess or cut-away at the end of the bed and to engage the end of the bar and stretch the same.

7. A straightening-bed having one or more communicating slits or spaces thereacross, forming a way for the passage of a cooling medium, and formed or provided at one end with a base-shoulder.

8. A straightening-bed having one or more communicating slits or spaces thereacross, forming a way for the passage of a cooling medium, and formed or provided at the upper portion of one end with a cut-away or recess, and at the lower portion of said end with a base-shoulder.

9. A straightener-bed having one or more communicating slits thereacross, forming a way for the passage of a cooling medium, and formed or provided at the upper portion of one end with a cut-away or recess.

In testimony whereof I affix my signature in presence of two witnesses.

RICHARD W. LUNDY.

Witnesses:

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M. O'BRIEN.