No. 817,618. PATENTED APR. 10, 1906.

F. R. BISHOP.

DIE FOR CURBING CHAINS.

APPLICATION FILED APR. 14, 1905.

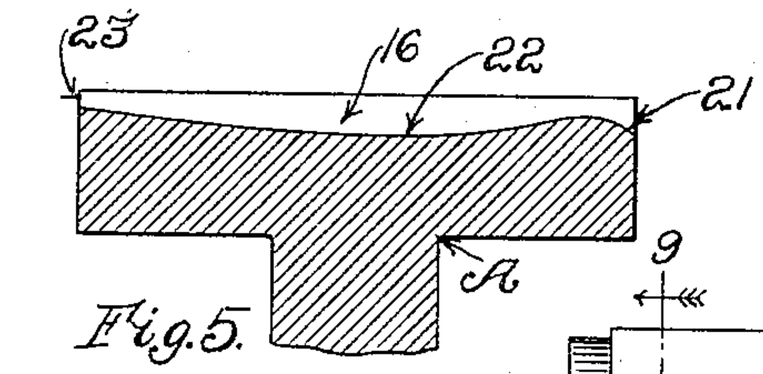


Fig. 5.

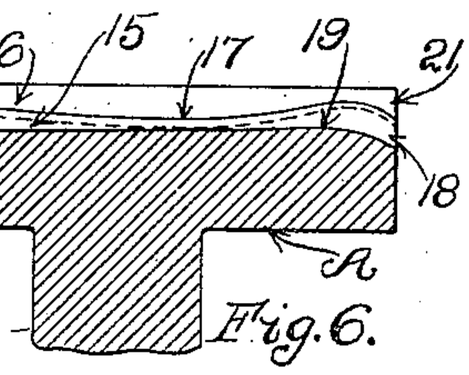


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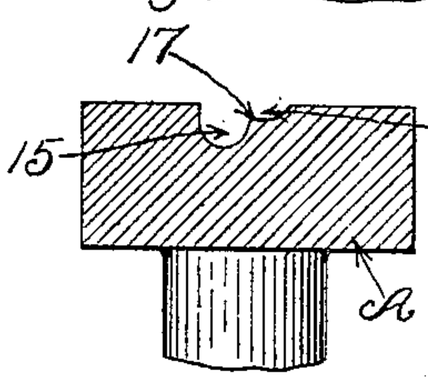


Fig. 7.

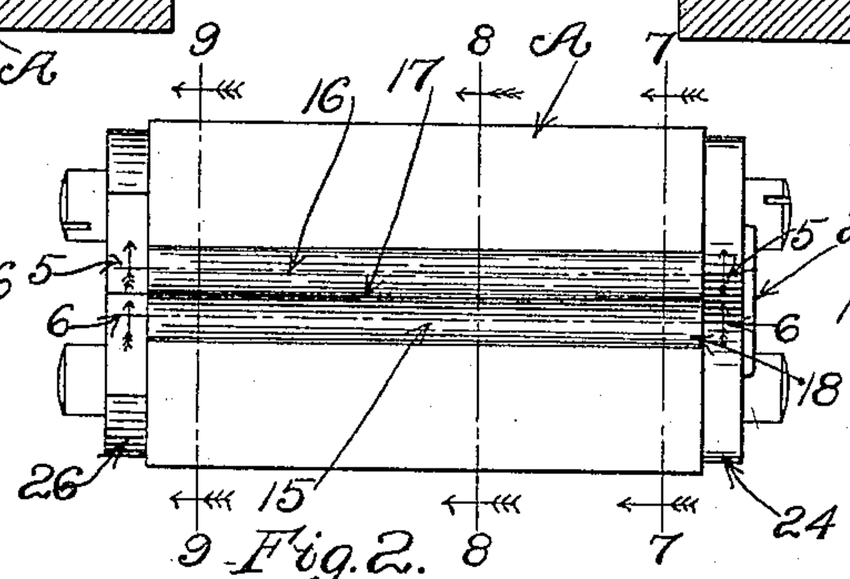


Fig. 2.

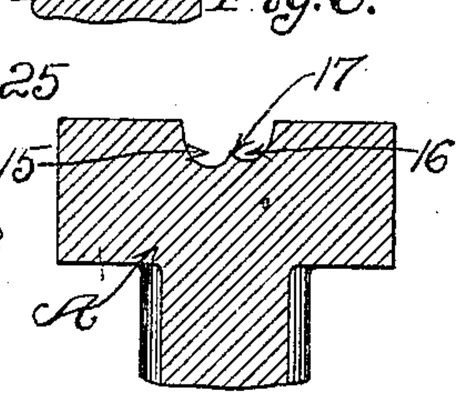


Fig. 8.

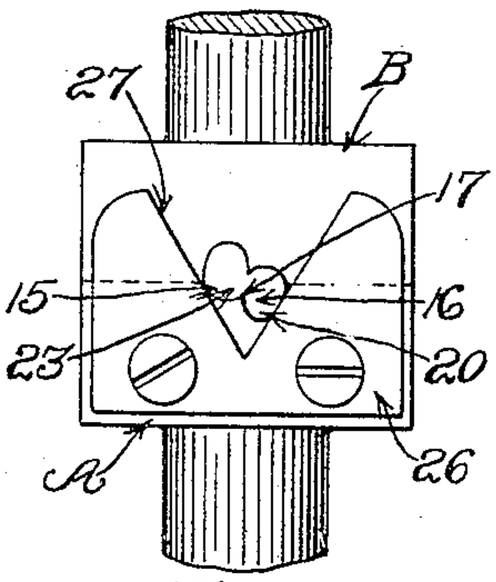


Fig. 14.

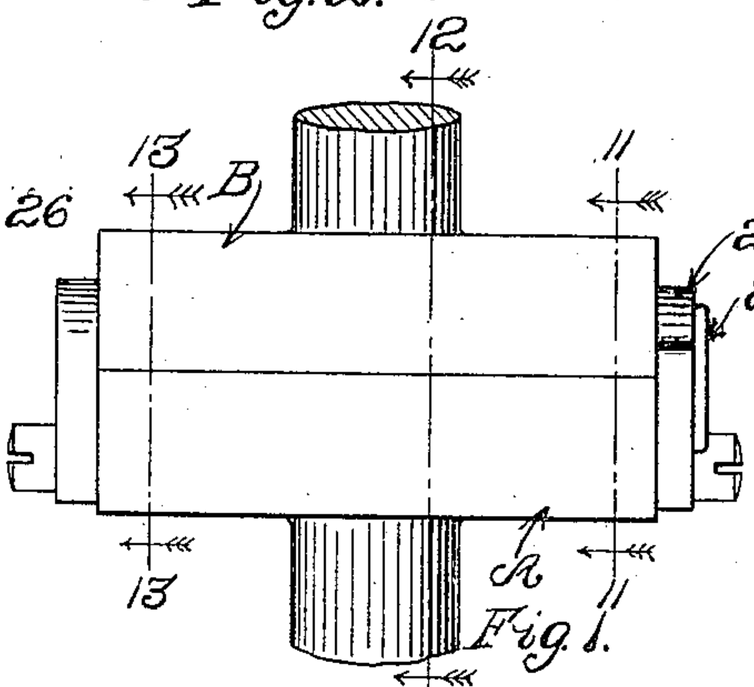


Fig. 1.

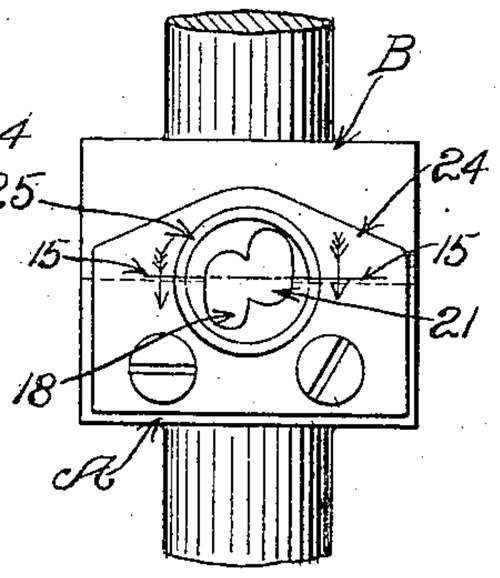


Fig. 10.

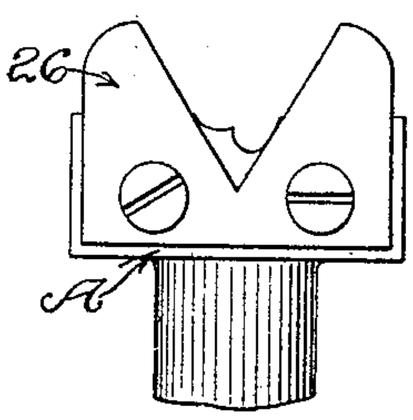


Fig. 4.

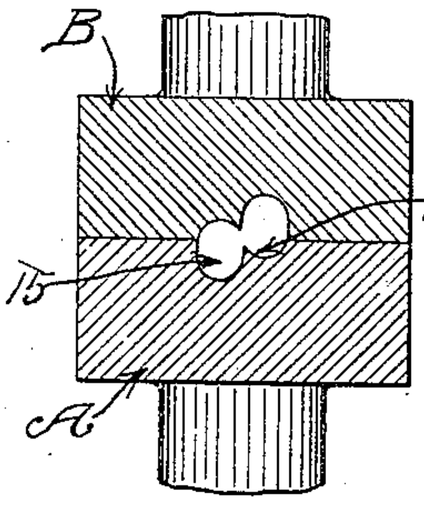


Fig. 11.

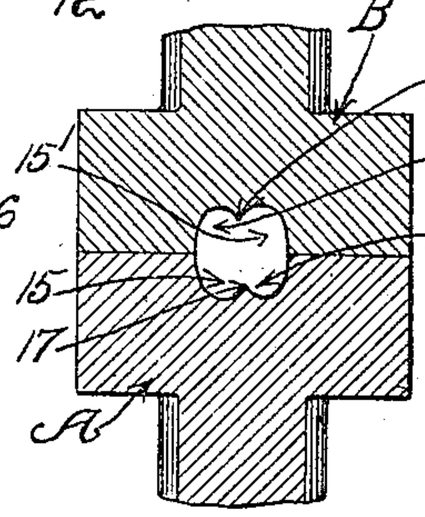


Fig. 12.

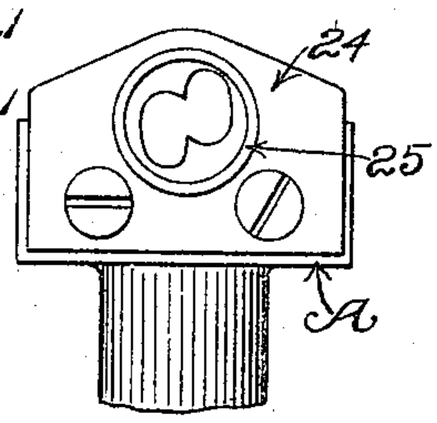


Fig. 3.

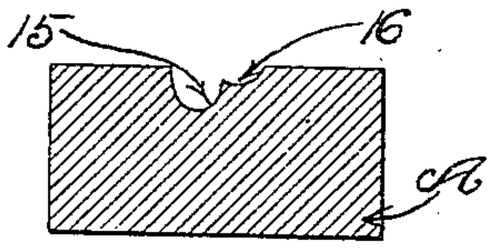


Fig. 9.

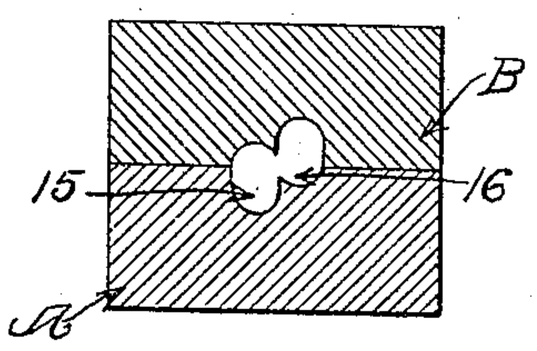


Fig. 13.

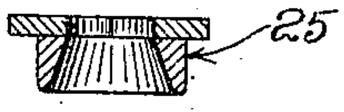


Fig. 15.

Witnesses:

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Attorney.

UNITED STATES PATENT OFFICE.

FREDERICK R. BISHOP, OF SOUTHBRIDGE, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO ARTHUR S. BISHOP, OF NORTH ATTLEBORO, MASSACHUSETTS.

DIE FOR CURBING CHAINS.

No. 817,618. Specification of Letters Patent. Patented April 10, 1906.

Application filed April 14, 1905. Serial No. 255,480.

To all whom it may concern:

Be it known that I, FREDERICK R. BISHOP, of Southbridge, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Dies for Curbing Chains, of which the following is a specification.

The invention relates to means for making a cable-chain into a curb-chain.

The object of this invention is to provide a pair of dies, one fixed and the other a plunger, each formed with coöperating curbing grooves and guides to enable the chain to be fed lengthwise of the groove in the fixed die and during its travel to be subjected to repeated blows from the plunger-die, which give more and more twist or curb to each link until it passes out at the exit end.

The invention consists in forming each die with a double groove with a slight fin between them, each groove being formed of varying depth as it extends from one end to the other, one of the grooves decreasing in depth from the entrance end for a short distance, then increasing in depth for a short distance, then decreasing in depth to the exit end, and the other groove starting with greater depth than the first-described groove and decreasing for a short distance, then increasing gradually to the exit end, the grooves of the plunger-die being made like those of the fixed die as viewed when both have their faces upward, thereby making them reverse when the plunger-die is face down, as it will be when in operation.

The invention will now be fully described and reference had to the accompanying drawings, and the novel features thereof will be particularly pointed out in the claims at the close of the specification.

In the drawings, Figure 1 is a side elevation showing the plunger-die resting on the lower die. Fig. 2 is a plan of the lower die and guide-plates. Fig. 3 is an end view of the entrance end of the lower die with guide-plate attached. Fig. 4 is an end view of the exit end of the lower die with guide-plate attached. Fig. 5 is a longitudinal section through the groove on line 5 5 of Fig. 2, the guide-plates being removed. Fig. 6 is a longitudinal section on line 6 6 of Fig. 2, the guide-plates being removed. Fig. 7 is a cross-section on line 7 7 of Fig. 2. Fig. 8 is a cross-section on line 8 8 of Fig. 2. Fig. 9 is a cross-section on line 9 9 of Fig. 2. Fig. 10 is an end view of the entrance end with the plunger-die resting on the stationary lower die. Fig. 11 is a cross-section of both dies together on line 11 11 of Fig. 1. Fig. 12 is a cross-section of both dies on line 12 12 of Fig. 1. Fig. 13 is a cross-section of both dies on line 13 13 of Fig. 1. Fig. 14 is an end view of the exit end when the plunger-die rests on the lower die. Fig. 15 is a section through the bushing of the entrance guide-plate.

As already stated, the grooves in the fixed die are like the grooves in the plunger-die; but when the plunger-die is in the inverted position, which it will be when in use, it will bring the deeper groove of one die in opposition to the shallower groove of the other die. A particular description of the grooves of one die will therefore apply to the other.

A represents the fixed die, and B the plunger-die. Figs. 2 to 9, inclusive, specially represent the fixed die A. The bed of the die is formed with two grooves 15 16. There is a slight fin 17 separating the two grooves, but at no point rising to the surface of the die. It has the general contour of the groove 16, as shown in Fig. 6. The bottom of the groove 15 is comparatively deep at the entrance end 18 (see Fig. 6) and inclines upward for a short distance, and from the upper point 19 it slopes downward again gradually to the exit end 20; but at the exit end it is still preferably somewhat shallower than the entrance end. The entrance 21 of groove 16 is not so deep as the entrance of groove 15 and rises slightly, then dips down for a short distance. From the point 22 it has an upward slope gradually to the exit end 23, where it reaches its least depth.

For convenience the parts of the plunger-die corresponding with similar parts of the fixed die are designated 15′ and 16′, and so on.

When the plunger-die is brought down to the fixed die, the entrance-passage will be shaped as shown in Figs. 3 and 10, and the several views shown in Figs. 10 to 14, inclusive, show the changing configuration of the passage in cross-section.

A guide-plate 24 is screwed to the fixed die on the entrance side, having a hole with a bushing 25 formed with a passage, which may be circular at the outer end, but at the

inner end should be as shown in Fig. 3 of shape similar to the shape of the entrance to the passage between the dies. At the exit end there is a guide-plate 26 attached to the fixed die. The guide-slot 27 may be V-shaped, as shown, but not necessarily so.

In operation the chain which starts as a cable-chain is drawn slowly through the guides and grooves of the lower die, while the plunger-die is made to rapidly reciprocate and hammer the chain on the lower die. The twist in the grooves as the chain is drawn through will give more and more curb to the links until it passes out at the exit end.

What I claim is—

1. A pair of dies for curbing chains, one die being fixed, and the other a plunger, each die having in its face two parallel grooves, the grooves in the plunger being similar to the grooves in the fixed die except being in reversed position, each groove being of varying depth in itself, and the two grooves varying from each other in depth, and a fin between the two grooves of each die which does not extend to the level of the face of the die so that when the faces of two dies are in contact the fins will not contact with each other.

2. A pair of coöperating dies for curbing chains, one die being fixed, and the other a plunger, each die having in its face a groove which is formed in two parallel channels, each channel being of varying depth in itself, and each varying from the other in depth, the channels in the plunger-die being like those in the fixed die except in reverse position relative to the channels of the fixed die, a fin between the two channels of each die which does not extend to the level of the face of the die, a guide secured to one end of the fixed die having a passage oblong in cross-section, which is in alinement with the passage formed between the two dies when they are in contact with each other, to receive the entering end of the chain.

3. A pair of coöperating dies for curbing chains, one die being fixed and the other a plunger, each die having in its face a groove which is formed in two parallel channels each of varying depth in itself, and each varying from the other in depth, the channels in the plunger-die being like those in the fixed die except in reverse position relative to the channels of the fixed die, a fin between the two channels of each die which does not extend to the level of the face of the die, a guide secured to one end of the fixed die having a passage oblong in cross-section, which is in alinement with the passage formed between the two dies when they are in contact with each other, to receive the entering end of the chain, and a guide attached to the exit end of the fixed die having a guide-passage in alinement with the groove in the die.

4. A pair of dies for curbing chains, each die being formed with two parallel grooves separated by a fin, the bottom of one of the grooves in each die decreasing in depth from the entrance end inward for a short distance, then increasing in depth, and then decreasing again to the exit end, the second channel decreasing in depth from the entrance end for a short distance then increasing to the exit end, the depth of both grooves being greater at the entrance than at the exit, and one of said grooves being of greater average depth than the other, said fin not extending to the surface of the bed, the grooves and fin of one die being similar to the grooves and fin of the other die except being in reverse position so that the grooves of differing form will mate with each other.

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

FREDERICK R. BISHOP.

Witnesses:
WILLIAM A. COPELAND,
BESSIE G. MORRIS.