Aug. 20, 1935. G. J. BLUM 2,011,611

SAW BLADE HOLDER

Filed Oct. 9, 1930

Fig. 1.

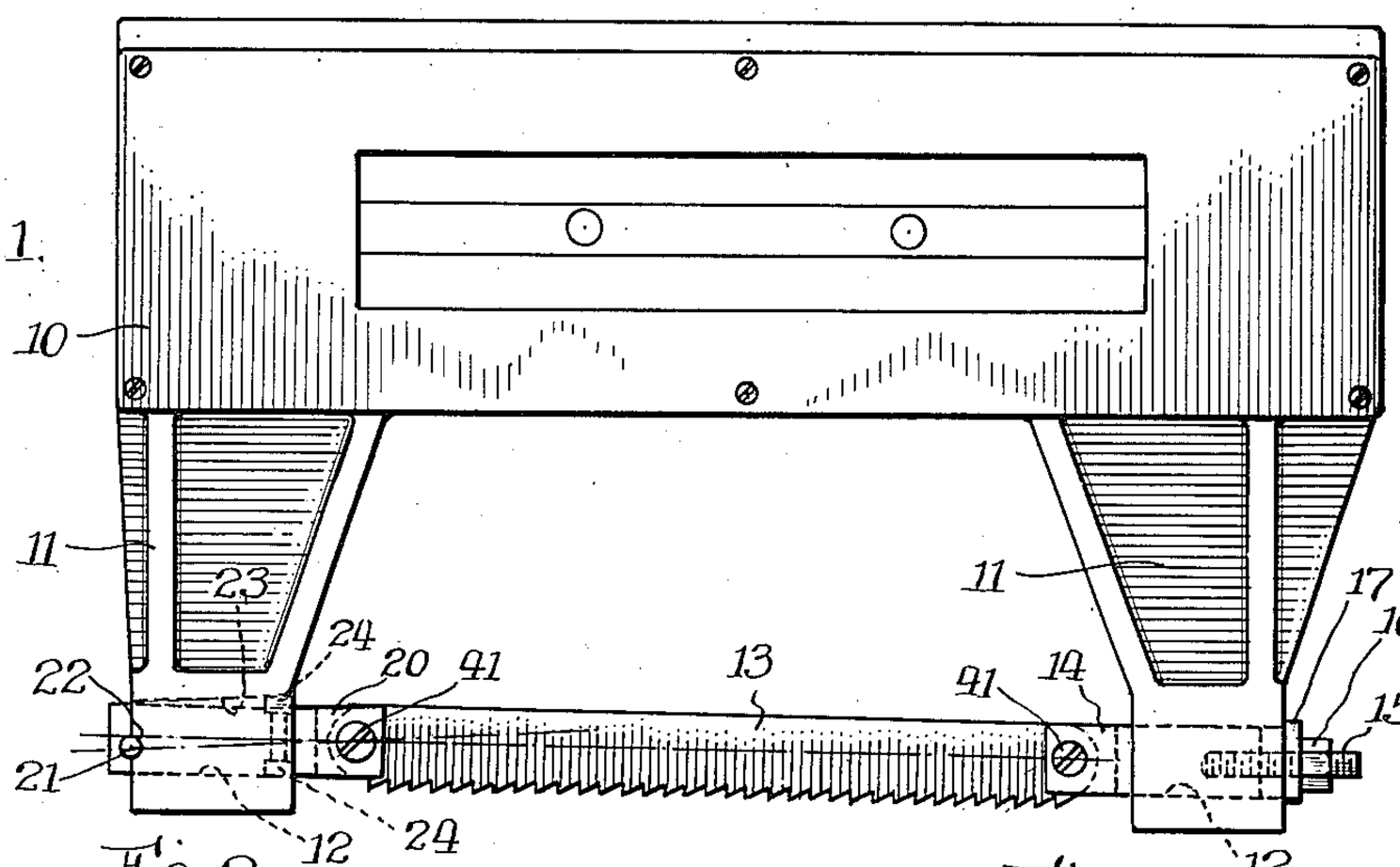



Fig. 2.

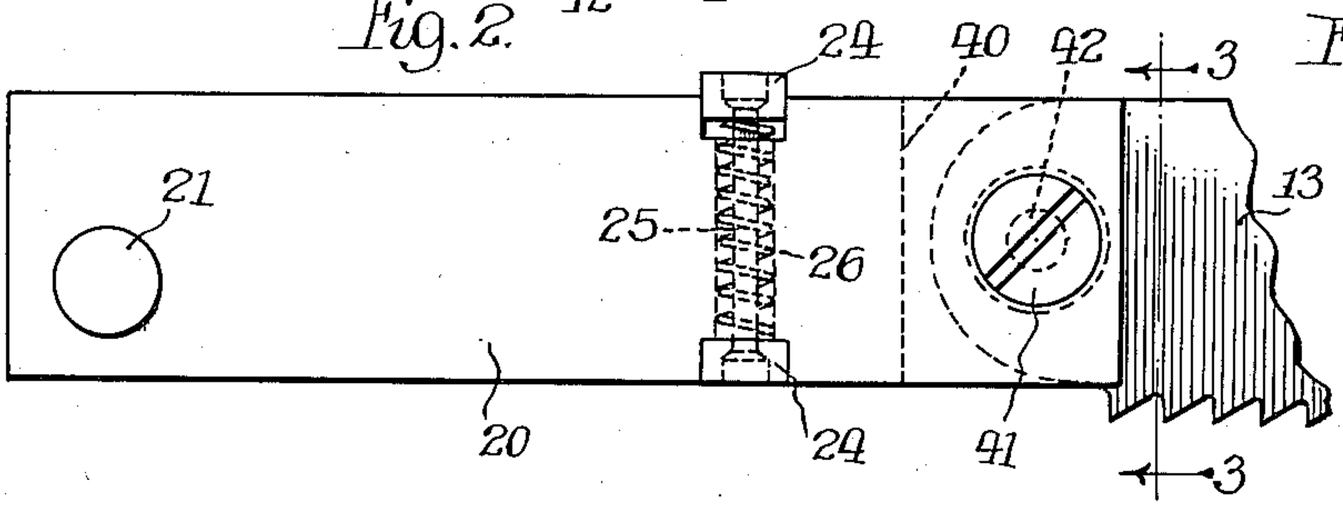



Fig. 3.

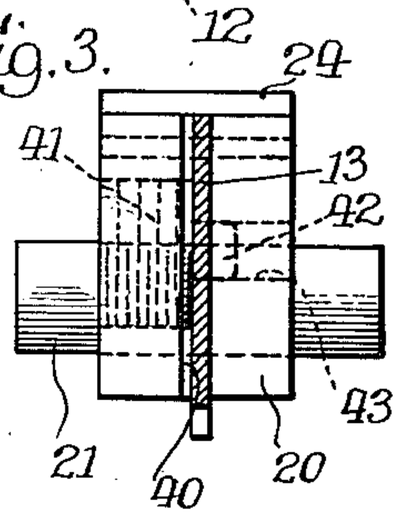



Fig. 4.

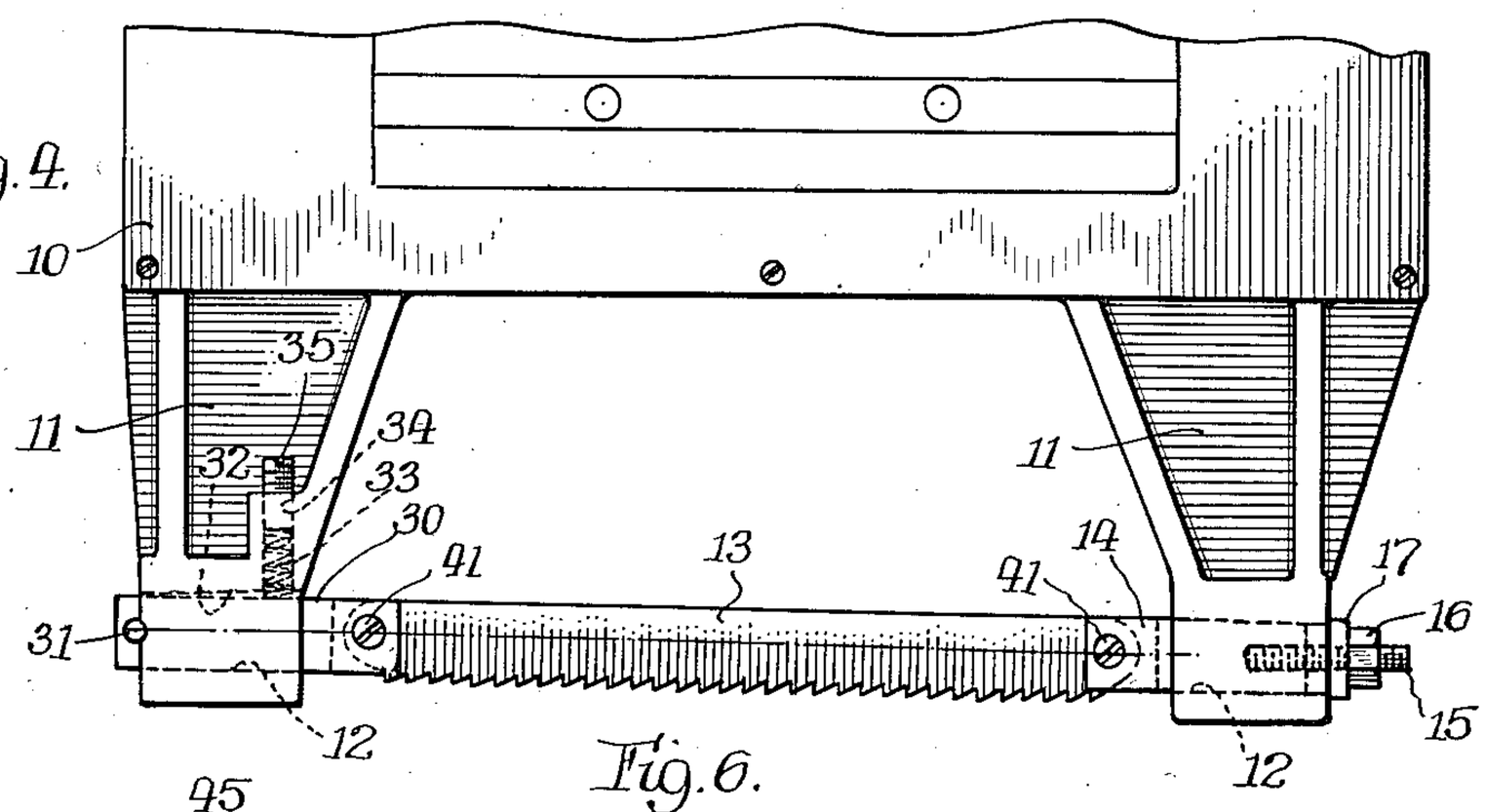



Fig. 5.

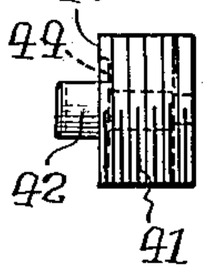
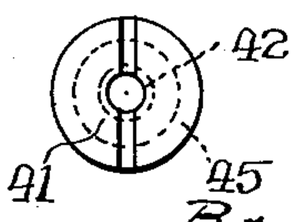



Fig. 6.

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# UNITED STATES PATENT OFFICE

2,011,611

## SAW-BLADE HOLDER

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Application October 9, 1930, Serial No. 487,432

7 Claims. (Cl. 29—73)

The invention relates generally to saw-blade holders and more particularly to a saw-blade holder for hack-saw blades used in power-driven sawing machines.

The general object of the invention is to provide a novel holder for hack-saw blades which prevents chatter of the blade.

Another object is to provide a holder of this character which permits a slight yielding or springing of the blade in a direction opposite to the direction of feed in order to hold the blade at an even pressure against the work and which is arranged to augment the force exerted by the springing of the blade.

A further object is to provide a holder of this character which securely holds the blade in place, in which a blade may be readily secured in a minimum of time, and which is simple and inexpensive to construct.

Still another object is to provide a holder which, if the blade should break and the broken end should jam against the work piece, is free to slide to an out-of-the-way position so that no other parts of the holder or saw frame will be broken.

Other objects and advantages will become apparent from the following description taken in connection with the accompanying drawing, in which:

Figure 1 is a side elevation of a saw-blade holder embodying the features of my invention.

Fig. 2 is an enlarged side elevation of a portion of the holder shown in Fig. 1.

Fig. 3 is a vertical section taken along the line 3—3 of Fig. 2.

Fig. 4 is a view similar to Fig. 1 of a modified form of holder.

Fig. 5 is a side view of the clamping screw.

Fig. 6 is an end view of the clamping screw.

While the invention is susceptible of various modifications and alternative constructions, I have shown in the drawing and will herein describe in detail the preferred embodiment and a modified form thereof, but it is to be understood that I do not thereby intend to limit the invention to the specific forms disclosed, but intend to cover all modifications and alternative constructions falling within the spirit and scope of the invention as expressed in the appended claims.

A saw-blade holder embodying the features of the invention is adapted for holding hack-saw blades used in power driven sawing machines, and comprises in general a U-shaped frame 10 which is adapted to be reciprocated, and means attached to the ends of the respective legs 11 of the frame 10 for attaching the ends of a saw-blade 13 thereto quickly and effectually and in a manner such as to prevent chatter,

In the present embodiment of the invention, the ends of the legs 11 are provided with alined apertures 12 in which a pair of blocks are respectively inserted for securing the saw-blade 13 thereto with the cutting edge of the blade parallel to the direction of reciprocation, the blocks being attached to the ends of the blade and held against movement relative thereto other than pivotal movement in the plane of the blade.

14 designates the block for securing the rear end of the blade to one leg 11 of the frame. This block fits snugly within the aperture 12 in that leg, and has a threaded hole in its outer end adapted to receive a screw 15 which extends outwardly beyond the outer face of the leg 11 and has a nut 16 and washer 17 thereon, the latter abutting against the outer face of the leg 11. Thus, when the block 14 is secured to the rear end of the blade and the front end of the blade is secured to the other leg 11, the blade may be placed under tension by tightening the nut 16.

An important feature of the invention resides in the mounting of the front end of the blade so as to permit slight pivotal movement and thus take advantage of a yielding of the blade for cushioning purposes during the first part of the cutting stroke. To this end, in the preferred form of the invention shown in Figs. 1, 2 and 3, a second block 20 is mounted in the aperture 12 in said leg. In the outer end of the block 20, a pin 21 is mounted with its axis transverse to the plane of the blade, the pin extending beyond both side faces of the block 20. The pin 21 is constructed to support the block 20 pivotally in the leg 11 for movement in the plane of the blade and for this purpose, fits into a notch 22 cut across the outer face of the leg 11.

In this embodiment (Fig. 1), the pin 21 is mounted below the line of tension of the saw blade, which line of tension extends through the points of attachment of the blade to the blocks 14 and 20, so that a line from the pin 21 to the point of attachment of the blade to the block 20 forms a downwardly opening angle with the line of tension of the blade, the point of attachment of the blade to the block 20 being the vertex of said angle. To permit a pivotal movement of the block 20 about the pin 21, the upper wall of the aperture 12 which receives the block 20 is tapered as at 23.

Means are provided for closing the gaps between the block 20 and the upper and lower walls

of the aperture 12 when the block is pivoted, which means comprises a pair of closure blocks 24 slidably mounted for vertical movement in slots cut across the upper and lower edges respectively of the block 20. A pin 25 extends vertically through the closure blocks 24 centrally thereof and through a vertical hole in the block 20. Surrounding the pin 25 is a compression spring 26 pressing outwardly on the closure blocks 24 and urging them into contact with the adjacent walls of the aperture 12. Thus, the closure blocks 24 will remain in contact with the walls of the aperture 12 for all positions of pivotal movement of the second block 20, and the gaps between the block 20 and walls of the aperture 12 will be kept closed.

In the operation of the preferred form of the device shown in Figs. 1, 2 and 3, when the blade is brought into cutting relation with the work, the downward feeding pressure of the sawing machine on the blade will cause the front end of the blade to spring upwardly to a slight extent, such springing movement being permitted by the pivotal mounting of the block 20. If the pivot pin 21 were in line with the line of tension of the blade, the tension of the blade would afford a certain resistance to any upward springing of the front end of the blade, but by placing the pin 21 below the line of tension of the blade, the resistance to upward springing of the front end of the blade is increased due to the angle between a line joining the pin 21 and the point of attachment of the blade to the block 20 and the line of tension of the blade. This pivotal mounting of the blade produces a cushioning effect during thre first part of the cutting stroke, which, it has been found, prevents chattering of the blade during the operation of sawing.

On account of the tapered wall of the aperture 12 in the leg supporting the front end of the blade, gaps between the block 20 and the walls of the aperture 12 would permit saw chips or dirt to enter into the aperture 12, so that free pivotal movement of the block 20 might be prevented. But the closure blocks 24 effectively prevent the entrance of such chips or dirt in the aperture.

In the modified form of holder shown in Fig. 4, a mounting similar in its broader aspects to that shown in the first form is employed and comprises a block 30 mounted in the aperture 12 in one leg 11 and secured at one of its ends to the front end of the blade. At the other end of the block 30, a pin 31, extending transversely to the plane of the blade beyond the side faces of the block 30, is mounted in line with the line of tension of the blade and is pivotally seated in the leg 11. To permit the block 30 to pivot slightly about the pin 31, the aperture 12, in which the block 30 is mounted, is tapered as at 32. A compression spring 33 mounted in a hole 34 formed in the leg 11 and held therein by a plug 35 bears on the upper surface of the block 30 and tends to resist pivotal movement thereof.

In the modified form of the device, the action of the front end of the blade is similar to that shown in the first form in that the tension of the blade is utilized to prevent chatter by producing a cushioning effect. But, as the pivot pin 31 is on the line of tension of the blade, the spring 33 is introduced to augment the downward pressure due to the tension of the blade when the front end of the blade is sprung upwardly, and any chatter is thus eliminated.

For clamping the blade 12 in the blocks 14, 20 and 30, the same form of structure is used in all the blocks. Each block has a slot 40 (see Figs. 2 and 3) cut in its inner end forming a pair of jaws and adapted to receive an end of the blade. Into one jaw, a screw 41 is transversely threaded, which screw has a pin 42 (see Figs. 5 and 6) extending through a hole in the blade and into a hole 43 in the other jaw. The inner end of the screw abuts against the blade and clamps it against the pin-receiving jaw. Thus, tightening the screw tends to force the jaws apart and the natural spring of the metal assists in the clamping action.

To provide a smooth seat on the inner end of the screw 41 to abut against a substantial area on the blade around the hole, the portion of the inner end of the screw immediately surrounding the pin 42 is relieved as at 44 to form an annular seat 45 radially spaced from the pin and adapted to bear against the blade when the screw is tightened in the block. Thus, clamping of the blade about the hole tends to prevent shearing of the blade.

In the operation of a hack saw, breakage of the blade may occur and, in the reciprocation of the saw frame after such breakage, the broken end of the blade may jam against the work piece with such force that further damage may occur such as breakage of the blade holder or of one of the arms of the saw frame. To avoid this difficulty, the blade holder is made in such a manner as to be freely slidable to an out-of-the-way position when the blade is broken. To this end, the screws 41 are of such character that they lie entirely within the cross-sectional area of the blocks 14, 20 or 30 and do not extend beyond the side faces thereof, as is shown in Fig. 3. Thus, should the broken end of a blade jam against the work piece, the blocks are free to slide outwardly through the apertures 12 in the legs 11 of the saw frame without interference of the screws 41 with the legs 11.

From the above description, it is apparent that I have provided a novel saw-blade holder which, while preventing chatter, securely holds the blade in place, and in which a blade may be readily secured in a minimum of time. It is also apparent that the holder is simple and inexpensive to construct.

I claim as my invention:

1. A saw-blade holder for hacksaw machines comprising, in combination, a carrier, and means for mounting the ends of a blade in the carrier and operable to place the blade under a normal predetermined tension lengthwise thereof, said means having a slight pivotal movement of the forward end of the blade about a point offset toward the work piece from the line of tension of the blade to increase the tension of the blade as an incident to its application to a piece of work.

2. A saw-blade holder comprising, in combination, a U-shaped frame, a saw blade, means for securing the rear end of the blade to one leg of the frame, and a block secured at one end to the front end of the blade against movement relative thereto other than pivotal movement and pivoted at its other end to the other leg of the frame on an axis transverse to the plane of the blade, said axis being below the line of tension of the blade to increase the force necessary to spring the front end of the blade upwardly.

3. A saw-blade holder comprising, in combination, a U-shaped frame having alined apertures in the ends of the respective legs of the frame, a saw-blade, means for securing the rear end of the blade to one leg of the frame, a block secured to the front end of the blade and within the aperture in the other leg of the frame and

pivoted to said leg for movement in the plane of the blade, the aperture receiving said block being tapered to permit the pivotal movement of said block, and means for automatically closing the gaps between the block and the walls of the aperture to prevent dirt or chips from entering said aperture.

4. A saw-blade holder comprising, in combination, a U-shaped frame, a saw-blade, means for securing the rear end of the blade to one leg of the frame, a block secured to the front end of the blade and extending through an aperture in the other leg of the frame, a pin pivotally supporting said block in said aperture and mounted adjacent the outer end of said block on an axis transverse to the plane of the blade, the aperture receiving said block being tapered to permit pivotal movement of the second block in the plane of the blade when the blade is sprung upwardly, and means for closing the gaps between said block and the walls of the aperture comprising a pair of closure blocks slidably mounted respectively in the opposite edges of the second block and a compression spring mounted within said second block and urging said closure blocks outwardly against the adjacent walls of the aperture.

5. A saw-blade holder comprising, in combination, a U-shaped frame having alined apertures in the ends of the respective legs of the frame, a saw-blade, means for securing the rear end of the blade to one leg of the frame, a block secured to the front end of the blade and pivoted for movement in the plane of the blade to the other leg of the frame within the aperture therein to permit the front end of the blade to spring slightly in an upward direction, and a spring mounted in the leg receiving the block and pressing downwardly on said block to augment the force exerted by the springing of the blade.

6. A saw-blade holder for hacksaw machines comprising, in combination, a carrier, means for mounting the ends of a blade in the carrier and operable to place the blade under a normal predetermined tension lengthwise thereof, said means being adapted to permit a slight pivotal movement of the forward end of the blade to increase the tension of the blade as an incident to its application to a piece of work, and means for automatically augmenting the resistance to said pivotal movement due to the increased tension of the blade.

7. A saw frame for a power hack saw having, in combination with a saw blade, two blocks of substantial thickness each having a longitudinal slot in one end adapted to receive one end of said blade, supporting legs rigidly mounted in spaced relation and having alined apertures therein for slidably receiving the respective blocks, a screw clamp carried by the inner end of each block for clamping one end of the saw blade within the slot in the block, and means carried by the outer ends of said blocks for limiting the inward sliding movement thereof relative to said supporting legs and adapted to maintain said blade under tension, the screw clamp in each block lying wholly within the cross-sectional area of the block and being adapted to permit said block and its screw clamp to slide outwardly as a unit through its corresponding aperture in the event of breakage of the blade.

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