July 12, 1938. R. J. LEHMANN 2,123,570

FLYING SHEAR

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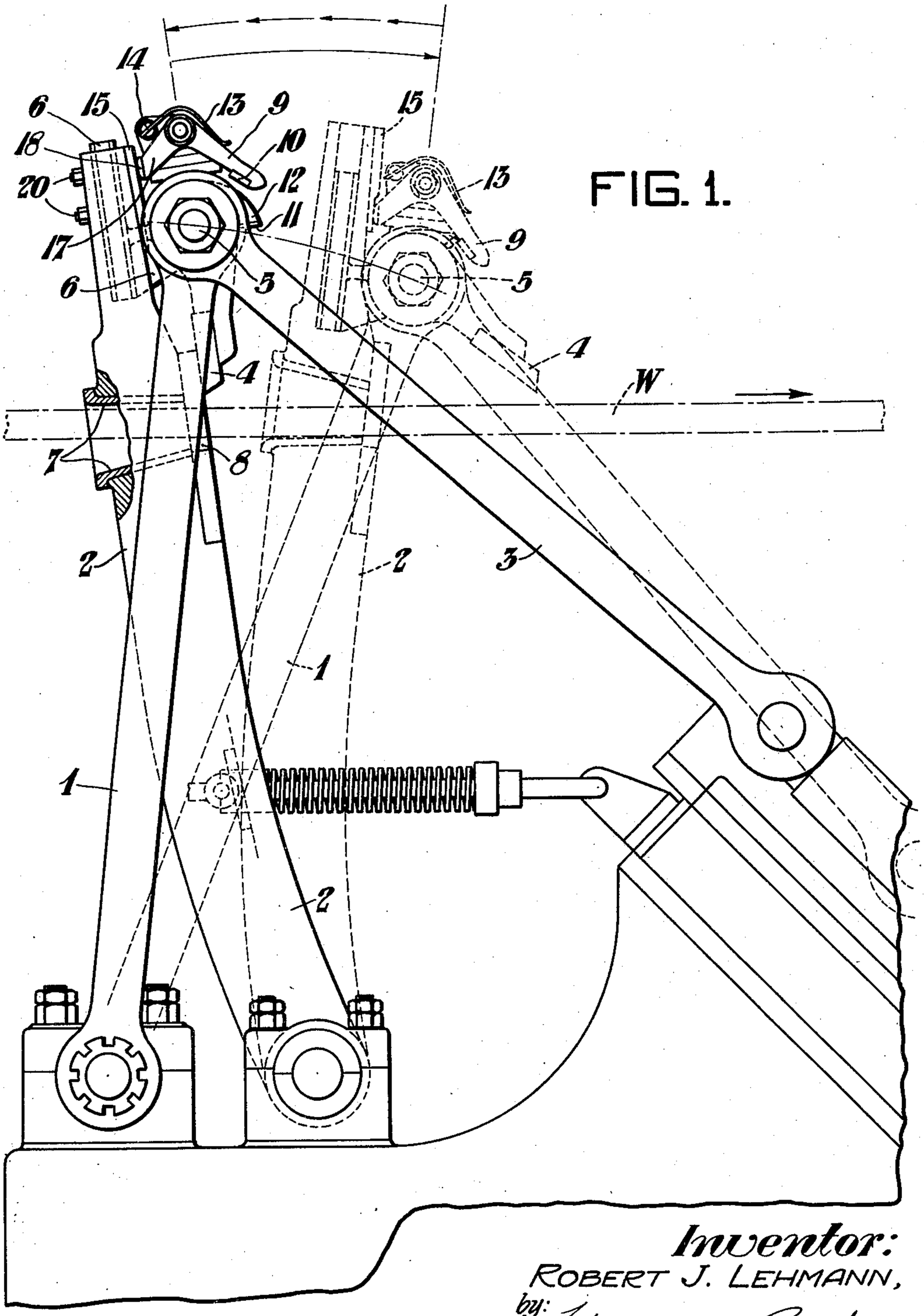

FIG. 1.

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FIG. 2.

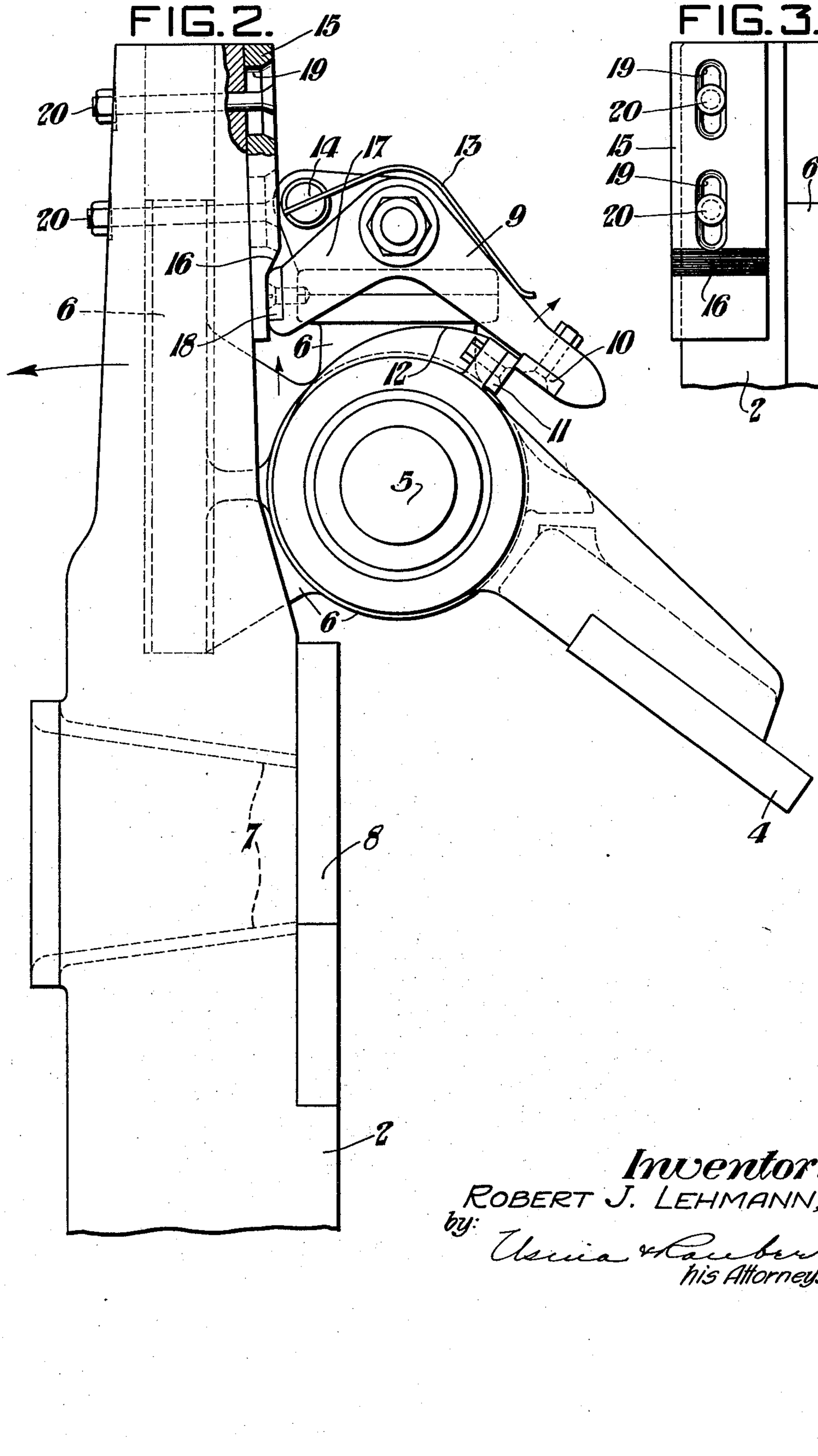

FIG. 3.

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Patented July 12, 1938 2,123,570

UNITED STATES PATENT OFFICE

2,123,570

FLYING SHEAR

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Application June 8, 1937, Serial No. 147,132

3 Claims. (Cl. 164—49)

This invention relates to flying shears of the type including a knife mounted to reciprocate in the direction of travel of passing work to be sheared, this knife being pivoted so that it swings free from the work upon completion of its shearing function to permit its return without marring the work, it being understood that such a shear operates to sever long lengths of material into shorter units, whereby work continues to pass upon the completion of a shear.

One of the objects of the present invention is to positively prevent the work from being marred by this knife. Other objects may be inferred from the following disclosure of a specific example of the invention.

Referring to the accompanying drawings:

Figure 1 is a side view of a shear embodying the principles of the invention.

Figure 2 is an enlargement from Figure 1.

Figure 3 is a detail.

The drawings show a shear that is conventional so far as it includes pivoted upstanding arms 1 and 2, the pivoted lower ends of these arms being laterally spaced so that when their upper ends swing they move vertically relative one another. The arms are operated through the medium of a suitably powered connecting-rod 3.

The knife 4 is pivoted at 5 to a cross-head 6 which is reciprocatively carried by the arm 2 but which connects through its pivot 5 with the arm 1. The arrangement is such that the arm 2 may reciprocate in the direction of passing work to be sheared, this causing reciprocation of the cross-head 6, and consequently of the knife 4, transversely of this work, because these parts are connected through the pivot 5 with the arm 1.

The work W passes through an opening 7 in the arm 2, the latter fixedly carrying a knife 8 which opposes the knife 4, the advance of the knife 4 toward the knife 8 upon movement of the arms 1 and 2 in the direction of the work, through the medium of the rod 3, serving to shear the work.

The moment the work is sheared the knife 4 is kicked free, and it is with the problem of keeping this knife free from the work during the return of the shear to its starting position with which the present invention is particularly concerned.

It might be mentioned that in shears of this type the arms 1 and 2 are so arranged that, as they swing with the work, they move the knife 4 diagonally respecting the work between positions where the knife is free from the work to one where it shears the work, this shearing being effected through the cooperation of the lower knife 8.

According to the invention, a latch 9 is pivoted to the cross-head 6 above the pivot 5, this latch carrying a hard steel block 10 on one end which engages a hard steel block 11 fixed to the turning top of the knife 4, upon riding over a cam 12, also fixed to this top and leading to this block 11. The parts are arranged so that latching occurs when the knife swings free from the work upon completion of its shearing operation.

The end of the latch 9 carrying the block is constantly urged to its knife-latching position by a spring 13, this being in the form of a flat steel strip having one end bearing against an appropriate end of the latch 9 and its other end suitably anchored, as at 14, to the cross-head 6.

It is, of course, necessary for the knife to swing back to its normal or operative position when the arms 1 and 2 return to their starting position after a shearing stroke, and this is effected through the medium of a cam 15 which is fixed to the arm 2 paralleling the path of the cross-head 6, this cam providing an incline 16 against which an extension 17 of the latch 9 works, this extension having a hard steel face 18 riding the cam 15. When the face 18 of the extension 17 rides the cam 15 below the incline 16, the spring-urged latch 9 is operative. When the face 18 rides the cam 15 above the incline 16, it raises and holds the latch 9 in unlatched position.

Assuming the arms 1 and 2 to be in their starting position, the face 18 will be on the upper part of the cam 15 and, through the extension 17, will be holding the latch 9 in its unlatched position, the knife 4 consequently depending in an operative position. When the rod 3 is powered to effect a shear, the arms start to move with the work, the knife 4 thereupon shearing the work and being immediately kicked free.

As previously explained, the knife 4 is moved toward the work through the operation of the arms 1 and 2 and the medium of the cross-head 6. As this cross-head 6 moves, the face 18 rides down the incline 16 of the cam 15 and permits the latch 9 to move to latching position under the urge of the spring 13. Therefore, when the knife 4 is kicked free from the work the two blocks 10 and 11 immediately engage and the knife is positively held free from the work. The latch 9 remains latched until the arms 1 and 2 return to their starting position a predetermined extent, whereupon the latch is moved to unlatching position through its extension 17, the face 18

riding over the incline 16 of the cam 15 at this time.

It will be appreciated that the knife 4 should not be unlatched so that it can swing to its depending position until the arms 1 and 2 have returned to a point where the cross-head 6 is raised so that it holds the knife 4 free from the work W. The required timing may be effected in a number of ways, but it is considered preferable to provide the cam 15 with bolt slots 19 through which fastening bolts 20 are passed, these bolts securing the cam to the arm 2. This permits the position of this cam to be adjusted and so permits timing of the movement of the latch to knife-unlatching position.

Although the principles of the invention have been disclosed by means of a specific example in accordance with the patent statutes, it is not intended to thereby limit its scope, except as defined by the following claims.

I claim:

1. A flying shear having a knife mounted to reciprocate diagonally respecting passing work to be sheared between positions where it is free from said work and where it shears said work, said knife moving with said work while approaching its second named position and being pivoted to swing free from said work upon completion of its shearing operation to permit its return to its first named position without contacting said work, said shear being characterized by including means responsive to said knife pivoting free from said work for positively locking it against reverse pivoting and means responsive to the return of said knife a predetermined extent toward its first named position for effecting unlocking action of the first named means so said knife can reversely pivot.

2. A flying shear including a mounting adapted to reciprocate in the traveling direction of passing work to be sheared, a knife pivotally carried by said mounting for reciprocation transversely of said work, said knife shearing said work upon reciprocation theretoward and the movement of said work causing said knife to pivot free therefrom, a latch for latching said knife when pivoted to a work-free position, said latch reciprocating with said knife, means for urging said latch to its knife-latching position, a cam fixed to said mounting and a cam-rider for said cam, said rider connecting with said latch and reciprocating with said knife, said cam and said rider cooperating upon reciprocation of said knife away from said work to move said latch to a knife-unlatching position against the urge of said means.

3. A flying shear including a mounting adapted to reciprocate in the traveling direction of passing work to be sheared, a knife pivotally carried by said mounting for reciprocation transversely of said work, said knife shearing said work upon reciprocation theretoward and the movement of said work causing said knife to pivot free therefrom, a latch for latching said knife when pivoted to a work-free position, said latch reciprocating with said knife, means for urging said latch to its knife-latching position, a cam fixed to said mounting and a cam-rider for said cam, said rider connecting with said latch and reciprocating with said knife, said cam and said rider cooperating upon reciprocation of said knife away from said work to move said latch to a knife-unlatching position against the urge of said means, and said cam being movable on said mounting to permit timing of the movement of said latch to knife-unlatching position.

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