April 30, 1935. F. R. PETTEPHER 1,999,637

SCREEN FOR USE IN WATERWAYS

Filed June 18, 1934

Fig. 1.

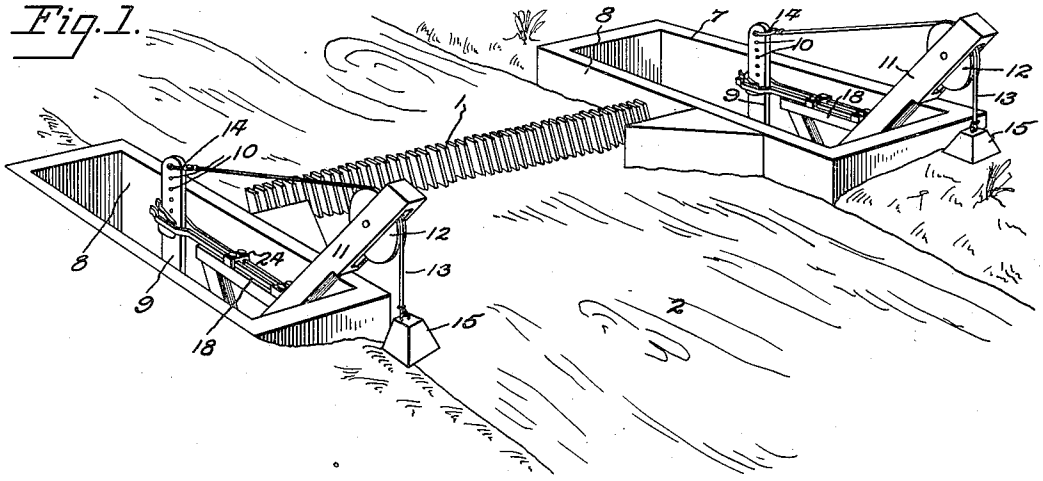


Fig. 2.

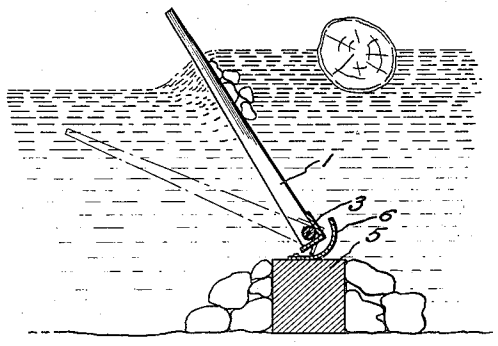


Fig. 3.

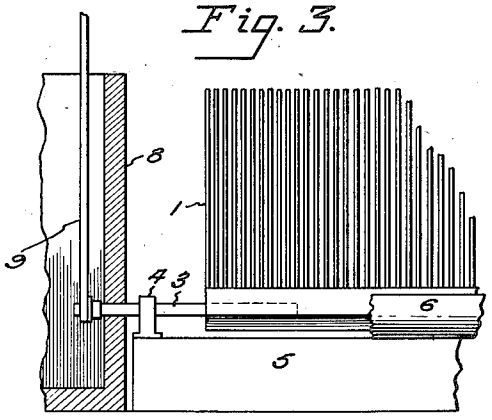


Fig. 4.

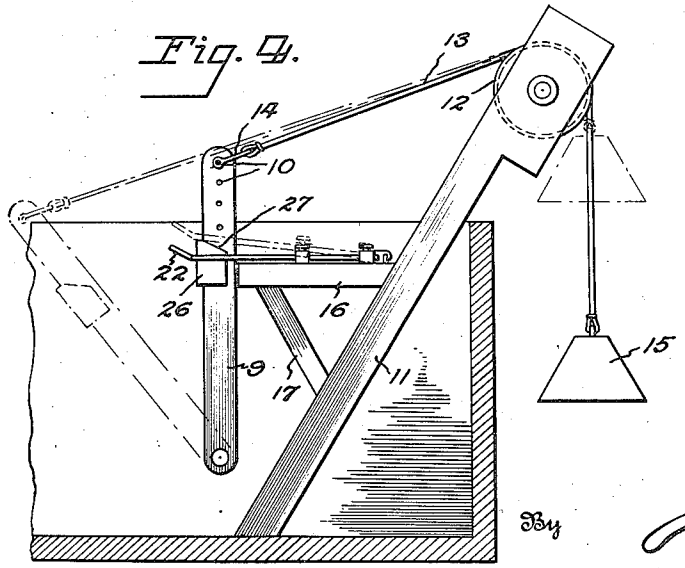
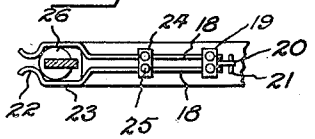


Fig. 5.



Inventor

F. R. Pettepher

By

Attorney

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SCREEN FOR USE IN WATERWAYS

Frank R. Pettepher, Spokane, Wash.

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4 Claims. (Cl. 210—172)

This invention is directed to a screen for use in any waterway for the control of the migration of fish, with the construction such that the screen is normally locked in an operative position and yields under the accumulated pressure of refuse or the like to permit the free passage of such refuse while insuring that the screen will return to and be locked in normal operative position on the release of such pressure.

The primary object of the present invention is the provision of a screen mounted for swinging movement on the bed of the waterway and normally locked in a position to project above the surface of the stream to ordinarily prevent the passage of fish or the like past the screen; the locking means being adjustable to maintain the screen against movement except under predetermined pressure against the screen, whereupon under such pressure the screen is automatically released and permitted to move to a position to free the obstruction, with means for automatically returning the screen when free of such pressure to an operative position within the influence of the locking means for further normal service.

The invention is illustrated in the accompanying drawing, in which:

Figure 1 is a perspective view showing the improvement.

Figure 2 is a vertical sectional view through the screen, showing the mounting.

Figure 3 is a broken elevation, partly in section, of the same.

Figure 4 is an elevation showing the means for stopping screen movement.

Figure 5 is a plan view showing a lock.

The screen proper includes a screen-like body 1 preferably constructed of bars of metal or the like having a length to project above the surface of the body of water, indicated at 2, when in operative position. The lower ends of the bars making up the screen 1 are secured to a shaft 3 supported in bearings 4 carried by a foundation block 5 appropriately anchored on the bed of the stream. A shield 6 is secured to the foundation block 5 and partially surrounds and extends above the shaft 3, as indicated in Figure 2, to protect the shaft 3 and the connection of the screen bars thereto from refuse flowing with the stream.

At each side of the stream, preferably in line with the side banks thereof, are arranged hollow pits 7, the inner side walls 8 of which are preferably though not necessarily aligned with the banks of the stream. The shaft 3 extends in both directions through the adjacent side walls 8 of the pits and the ends of the shafts within the pits are provided with bars 9 which extend upwardly at right angles to the shaft. The bars 9 are spaced from the walls 8 and extend above the tops of the pits, the upper ends of the bars being provided with a longitudinally ranging series of openings 10.

A support 11 is fixedly secured in the pit, extending upwardly beyond the same preferably at an angle to the vertical, with the upper end, which is disposed above the upper ends of the bars 9, provided with a sheave or pulley 12. A cable 13 passes over the sheave 12 and is terminally provided with a hook or like connection 14 adapted to engage any one of the openings 10 of the bars 9. The opposite end of the cable is provided with a weight 15 sufficient to move the screen in the opposite direction in the absence of undue pressure against the screen.

A locking means is provided for the bars 9 which serves to hold the screen in operative position in the stream. This locking means is supported upon a strip 16 fixed within each pit 7, being, for example, secured to the support 11 and braced, as at 17. Mounted for movement on the strip 16 are locking members or rods 18, the rear ends of which are removably secured in a block 19 which is swingingly supported at 20 in an eye or like member 21 secured to the strip. The arrangement is such that the locking rods 18 are free to swing upwardly relative to the strip.

The forward ends of the rods are outwardly flared relatively at 22 and adjacent such flared ends are laterally offset at 23 to together provide an approximately rectangular enlargement between and adjacent the forward ends of the rods, the flaring ends 22 of the rods providing an entrance to this enlargement. The rods 18 are of spring character and a block 24 is slidably mounted on said rods and may be secured thereon in any desired longitudinal position by set-screws 25. The purpose of the block 24 is to control the resiliency or spreading resistance of the forward ends of the rods, as obviously the more closely the block 24 is moved toward the forward ends of the rods, the greater the resistance of such forward ends to spreading.

The locking members are arranged at right angles to the normal position of the bars 9 and the enlarged portion 23 of each pair of locking members is so disposed as to occupy a position coincident with that position of the bars 9 determining the normal or operative position of the screen. The bars 9 are provided in that

portion to be engaged by the locking members with a rounded or circular member 26, the diameter of which is substantially equal to the transverse dimension of the enlargement 23 of the locking members and the upper edge 27 of which lock is inclined downwardly in the direction of operative movement of the bars 9.

The normal position of the screen is at a slight inclination vertically in the direction of flow of water to the screen, as clearly shown in Figure 2. In this position, the weight 15 acts to hold the bars 9 substantially vertical with the relative blocks 26 thereon within the enlargement 23 of the locking members. In this position, the screen prevents the migration of fish longitudinally of the stream past the screen. On the accumulation of refuse against the screen, which would otherwise tend to dam the stream, such refuse, when exerting sufficient pressure against the screen to overcome the tension of the locking members against spreading and the influence of the weight 15, will force the bars 9 outwardly from between the locking members and thus permit the screen to tilt to a position sufficient to allow the accumulated refuse to freely flow with the stream, this movement of the screen being indicated in Figure 2.

When the screen has been freed from the pressure of the refuse, the weight 15 acts to return the screen to a normal operative position. As the bars 9 move to normal position under the influence of the weight 15, the inclined edges 27 of the blocks 26 engage the slightly upturned flared ends of the locking members and swing the members upwardly on the swinging support 20. As the locking members are then in position above the blocks 26 and in line with the relatively narrow bars 9, the latter may freely move through the opening provided by the flared ends 22 of the locking members until the block 26 is aligned with the enlargement 23 of the locking members, whereupon the latter gravitate to an outward position to embrace the block and so lock the screen in operative position subject to further movement under accumulated pressure thereon.

The control of the pressure at which the screen would yield is provided through the adjustment of the block 24 and also through the connection of the hook 14 of the weighted cable and the appropriate opening 10 in the bars 9. Through adjustment of the block 24, the spread of the locking members under the pressure on the screen may be rendered as resistant as desired within the limits afforded by the bars and the direct influence of the weight 15 may be varied by changing the leverage of its pull on the screen support through the use of the appropriate opening 10. Thus, the screen may be permitted to yield under varying degrees of pressure thereon as may be rendered desirable in different localities and under different conditions.

What is claimed to be new is:

1. A screen for use in a flowing stream, a locking means for holding the screen against movement under normal conditions, said locking means automatically releasing the screen for movement under predetermined pressure on the screen, said locking means comprising spring rods, means for adjusting the tension of the rods to vary the locking influence, and a bar connected with the screen and adapted to be embraced by the rods to lock the screen aganist movement, said rods spreading under predetermined pressure on the screen to free the bars, and means adjustably connected to the bars to return the screen to normal position following pressure movement thereof.

2. A screen for use in a flowing stream, a locking means for holding the screen against movement under normal conditions, said locking means automatically releasing the screen for movement under predetermined pressure on the screen, said locking means comprising spring rods, and a bar connected with the screen and adapted to be embraced by the rod to lock the screen against movement, said rods spreading under predetermined pressure on the screen to free the bars, and means for adjusting the spring tendency of the rods to vary the force required to spread the rods to release the bars.

3. A screen supported for swinging movement in a stream, bars connected to the ends of the screen, locking rods arranged in parallel relation and having spaced terminals through which the bars may freely pass, said bars being formed inwardly of such terminals to provide an enlargement, a block secured on each bar in position to seat in said enlargement in the locked position of the bars, and means carried by the block to displace the locking rods in the movement of the bars toward the locking rods to arrange the spaced terminals of the rods in line with the edges of the bars, whereby to permit the bars to pass freely between the rods.

4. A screen mounted for swinging movement in a stream, a shaft mounted for rotation and carrying the screen, bars carried by each end of the shaft, a block on each bar having an inclined upper end, locking rods arranged in pairs for each bar, said locking rods being supported for bodily swinging movement and being spaced apart at their entrant ends to permit the free passage of the bars, the rods being formed inwardly of their entrant ends with an enlargement of a size to receive the block, and a weight connected to the upper ends of the bars to move the screen toward an operative position in the absence of pressure thereon, said operative movement of the screen causing the inclined end of the block to swing the locking rods upwardly and permit passage of the bar through the entrant ends thereof, the enlarged portion of the locking rods moving downwardly to embrace the block on each bar when the bar has moved operatively to align the block with said space.

FRANK R. PETTEPHER. [L. S.]