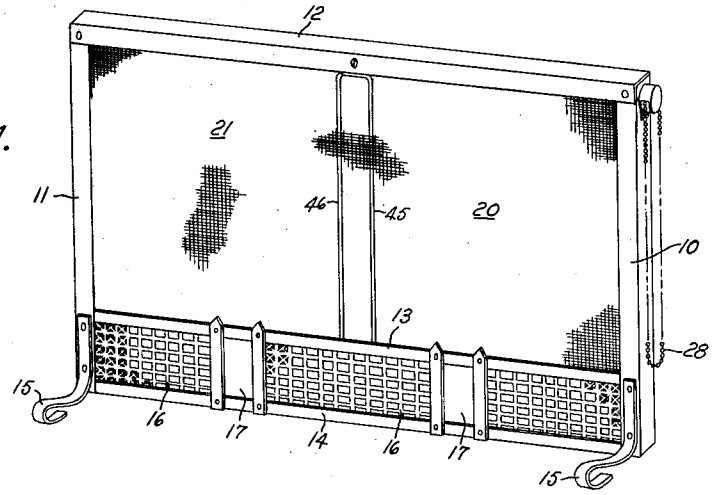
Nov. 4, 1952 H. B. ECKLES 2,616,499

FIREPLACE SCREEN

Filed April 8, 1949

FIG. 1.



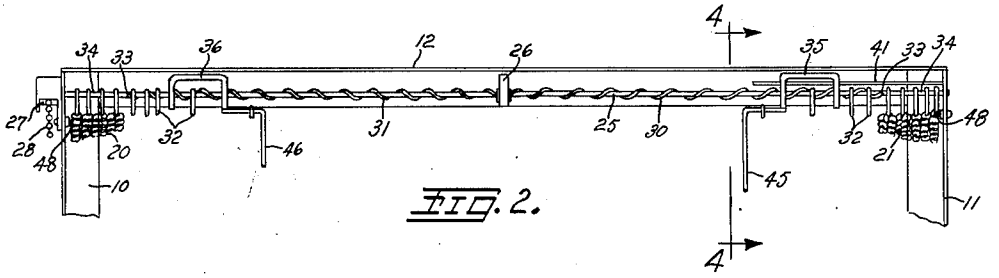


FIG. 2.

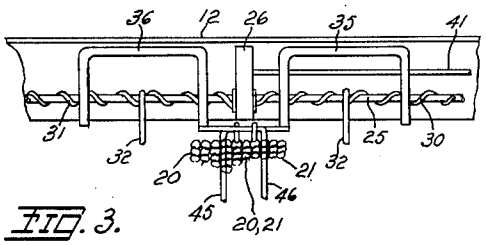


FIG. 3.

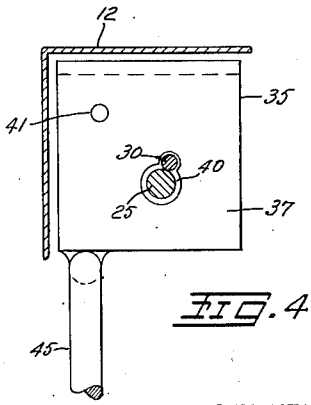


FIG. 4.

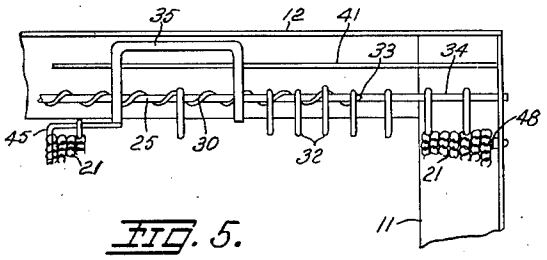


FIG. 5.

INVENTOR.
Harley B. Eckles

BY
Cook and Eckermorhorn
ATTORNEYS

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FIREPLACE SCREEN

Harley B. Eckles, Portland, Oreg.

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4 Claims. (Cl. 160—126)

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This invention relates to an improved fireplace screen of the type having curtains that may be drawn together in front of the fireplace opening.

The general object of the invention is to provide an improved curtain type screen having a novel mechanism for opening and closing the curtains. Other objects are to provide a novel type of suspension for fireplace curtains, to provide an improved form of worm shaft for opening and closing the curtains, to provide a novel positive feed device for drawing the edges of the curtains together and for overlapping the curtains, and to provide means for insuring the proper hanging and closing of the curtains from top to bottom along their meeting edges.

The present screen is embodied in a vertical rectangular frame having a horizontal shaft extending along its upper edge to support and control the movements of two flexible wire mesh curtains. One half the length of the shaft is provided with a relatively high pitch left hand worm or thread, and the other half the shaft is provided with a similar right hand worm. The two curtains are suspended from a series of rings which hang loosely on the shaft and may be propelled back and forth therealong by rotation of the shaft to move the curtains together and apart. The shaft is rotated by an endless chain on a sprocket wheel at one end of the frame. A nut having a positive feed on the worm is provided for the leading edge of each curtain, but the rings supporting the other parts of the curtains are loose enough to jump the worm thread, when necessary, to distribute the curtains along the rod as the leading edges are advanced toward closed position. Each nut carries a vertical curtain rod to hold the leading edge of its curtain stiffly in a vertical position to overlap the two curtains a short distance when they are drawn together. Thus, by simple manual manipulation of the pull chain in one direction, the two curtains may be drawn together to close the screen, and, by pulling the chain in the opposite direction, the curtains may be drawn apart for access to the fireplace.

These and other objects and advantages and features of the construction are described in detail in the following specification, having reference to a preferred embodiment of the invention shown in the accompanying drawing.

In the drawing:

Figure 1 is a perspective view showing the front side of a fireplace screen embodying the features of the invention;

Figure 2 is a rear elevation view of the upper part of the screen;

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Figure 3 is a fragmentary elevation view of the central part of the worm shaft showing the curtains in closed position;

Figure 4 is a fragmentary sectional view taken approximately on the line 4—4 of Figure 2; and

Figure 5 is an enlarged fragmentary view of the right end of the worm shaft shown in Figure 2.

In the illustrated embodiment, the fireplace curtains and their operating mechanism are carried by a vertical frame comprising a pair of uprights 10 and 11 and horizontal rail members 12, 13 and 14. The members 13 and 14 may comprise flat bar stock, but the members 10, 11 and 12 are preferably made of angle stock to stiffen the frame and furnish convenient support for the mechanism. The present screen is of the portable type, being equipped with feet 15 on the front side and other feet on the rear side, not shown, so that the frame will stand by itself on the floor or hearthstone. The lower part of the screen between the members 13 and 14 is preferably filled in with fixed ornamental screen panels 16 having openings 17 therebetween to allow the andirons to project through the screen.

It will be apparent, however, as the description proceeds, that the important features of the invention involve the mechanism for opening and closing a pair of wire mesh curtains 20 and 21 extending between the top member or rail 12 and the bottom screens 16, and that the invention is, therefore, equally applicable to other types of frames and also to screens which are mounted directly on the fireplace instead of on a portable base. It will be readily appreciated that the lower ends of the curtains 20 and 21 may extend down to the hearth and may be designed to sweep over the andirons, or in front of the andirons, so that substantially the only part of the frame necessary to the present invention is the top rail 12 which carries the curtain operating mechanism.

The important features of the invention, therefore, involve the rotatable shaft 25 at the top of the frame which supports and moves the curtains 20 and 21. Circular holes in the uprights 10 and 11 form bearings to support the ends of the shaft 25, and its center has bearing support in a block 26 mounted within the angle of the top member 12. One end of the shaft carries a sprocket wheel 27 on the outside of upright 10 for an endless chain 28 to rotate the shaft. The shaft has left and right hand worms 30 and 31 on opposite sides of its central bearing block 26, which worms may be easily formed by twisting smaller rods or tubing around the shaft 25 and

brazing or welding them thereto to make the parts integral.

The curtains 20 and 21 are suspended from a plurality of rings 32, and it is important to note that both worms 30 and 31 terminate at points 33 spaced a sufficient distance from the uprights 10 and 11 to provide parking spaces 34 beyond the ends of the worms for the rings when the curtains are drawn open. The curtain supporting rings 32 are adapted to feed along the shaft 25 by the action of the worms as the shaft rotates, but these rings are made large enough to jump the worm thread easily in order to distribute themselves properly and relieve any gathering of the curtain when lateral tension is applied to the curtains. The rings 32 in themselves, therefore, do not constitute a positive feed mechanism for the curtains which would insure the simultaneous meeting of the two curtains in the center of the frame.

A positive feed device is provided for the leading edge of each curtain comprising the respective nuts 35 and 36. These nuts may take various forms to fit the particular worm thread, but in the present embodiment they are formed of flat bar stock bent to inverted U shape and having square ends 37. The nuts travel within the angle of the top rail 12 whereby the latter constitutes a longitudinal guide to prevent the nuts from rotating, as shown in Figure 4. In view of the high pitch of worms 30 and 31, all that is necessary to form a thread in the nuts is an oval shaped opening 40 in each end 37, which opening may have a loose fit on the shaft and worm as shown. The nut 35 carries a stop rod 41 extending out from either end of the nut to limit the travel of the mechanism.

The nuts 35 and 36 are equipped with vertical curtain rods 45 and 46 attached to the leading edges of the curtains to hold these edges straight and stiff in vertical parallelism so that there will be no gaps between the curtains when the nuts are drawn together at the center of the frame. These vertical curtain rods are extended from the ends of the nuts to project under and past the center bearing block 26 as shown in Figure 3. Overlapping of the meeting edges of the curtains is provided for by attaching the rod 45 to the outer side of the nuts 35 as shown in Figure 4, and by attaching the rod 46 to the inner side of its nut 36 so that the offset positions of these rods will allow them to pass each other freely with their respective curtains. The end of the stop 41 which strikes the block 26 is made of such length that the curtains will overlap properly without allowing the nuts 35 and 36 to jam against this block, as shown in Figure 3.

The other end of the stop rod 41 is made of such length as to allow the nuts to run almost to the points 33 at the ends of the worms, the limiting position being shown in Figures 2 and 5 when the end of the rod strikes the upright member 11 of the frame. It will be observed that most of the rings 32 are then parked in the space 34 beyond the end of the worm, where they would not be picked up unless they were drawn over to the point 33 by the movement of the curtain. The positive feed movement of the nuts 35 and 36 insures that the leading edges of the curtains will be drawn toward each other when the shaft 25 is rotated in the proper direction to close the curtains, causing the rings accumulated in each space 34 to be picked up one by one by the end of the worm as the shaft rotates. If several of the rings should bunch together on one turn of the worm, the tension in the curtain will later cause some of them to jump the worm and distribute themselves properly as the leading edge of the curtain approaches the center of the frame. The upper corners of the curtains adjacent the upright members 10 and 11 are attached thereto by bolts 48 to prevent the curtains from drawing away from the sides of the frame, and the lower parts of the curtain edges are also attached to the uprights.

Thus, the present invention provides a simple and inexpensive mechanism for opening and closing the curtains in unison by simply pulling on one side or the other of the endless chain 28. By making the worms 30 and 31 of relatively high pitch, the movement of the curtains will be smooth and rapid and will be accomplished easily without grasping a hot part of the structure directly in front of the fire. The main portions of each curtain are preferably made of a spiral wire mesh which is freely flexible horizontally to allow gathering of the curtain into a small space at each side of the frame. If flexibility is also required in a vertical direction to sweep over andirons or other obstructions on the hearth, the curtain may be readily modified as desired without departing from the spirit of the invention.

The various parts shown and described may take different forms and certain parts may be used without others to accomplish objects of the invention. Also, the mechanism may be elaborated in some respects while still retaining the more important features and advantages of the present construction.

Having now described my invention and in what manner the same may be used, what I claim as new and desire to protect by Letters Patent is:

1. In a fireplace screen having a pair of movable curtains, a horizontal worm shaft at the top of the screen having left and right hand worms, a pair of nuts on said shaft in positive feeding engagement with said worms and having extended bearing longitudinally along the shaft to prevent tilting of the nuts on the shaft, offset vertical curtain rods rigid with said nuts engaging and extending along meeting edges of the curtains to hold the meeting edges straight and perpendicular to said worm shaft, said curtain rods being adapted to pass each other at the center of the screen to overlap said meeting edges of the curtains, and rings supporting intermediate portions of said curtains on said worm shaft in non-positive feeding engagement therewith.

2. In a fireplace screen having a pair of movable curtains, a horizontal worm shaft at the top of the screen having left and right hand worms, a pair of nuts on said shaft in feeding engagement with said worms and having extended bearing longitudinally along the shaft to prevent tilting of the nuts on the shaft, flat lateral surfaces on said nuts, a frame member having a flat surface extending parallel with said shaft in cooperative relation with said flat surfaces on the nuts to prevent rotation of the nuts, offset vertical curtain rods rigid with said nuts engaging and extending along meeting edges of the curtains to hold the meeting edges straight and perpendicular to said worm shaft, said curtain rods being adapted to pass each other at the center of the screen to overlap said meeting edges of the curtains, rings supporting portions of said curtains on said worm shaft, said worms terminating short of the shaft ends to provide spaces at the ends of said shaft beyond the ends of said worms for supporting said rings in non-feeding engagement with said

shaft, and means to stop outward travel of said nuts approaching said ends of the worms.

3. In a fireplace screen having a pair of movable curtains, a horizontal worm shaft at the top of the screen having left and right hand worms, a pair of nuts on said shaft in positive feeding engagement with said worms and having extended bearing longitudinally along the shaft to prevent tilting of the nuts on the shaft, offset vertical curtain rods rigid with said nuts engaging and extending along meeting edges of the curtains to hold the meeting edges straight and perpendicular to said worm shaft, said curtain rods being adapted to pass each other at the center of the screen to overlap said meeting edges of the curtains, and rings supporting intermediate portions of said curtains on said worm shaft in non-positive feeding engagement therewith, said worms terminating short of the shaft ends to provide spaces at the ends of said shaft beyond the ends of said worms for supporting said rings in non-feeding engagement with said shaft.

4. In a fireplace screen having a pair of movable curtains, a horizontal worm shaft at the top of the screen having left and right hand worms, a pair of flat-sided nuts on said shaft in positive feeding engagement with said worms and having extended bearing longitudinally along the shaft to prevent tilting of the nuts on the shaft, a horizontal frame member for the screen extending along said shaft and having flat vertical front and horizontal top walls cooperating with said flat sides on said nuts to prevent rotation of the nuts, offset vertical curtain rods rigid with said nuts engaging and extending along the meeting edges of the curtains to hold the meeting edges straight and perpendicular to said worm shaft, said curtain rods being adapted to pass each other at the center of the screen to overlap said meeting edges of the curtains, and rings supporting intermediate portions of said curtains on said worm shaft in non-positive feeding engagement therewith, said worms terminating short of the shaft ends to provide spaces at the ends of said shaft beyond the ends of said worms for supporting said rings in non-feeding engagement with said shaft.

HARLEY B. ECKLES.

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