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REFLECTING AND FOCUSING APPARATUS WITH PIVOTALLY
ADJUSTABLE SPACED APART REFLECTING MEMBERS
FOR HEAT AND LIGHT RAYS

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2 Sheets-Sheet 1

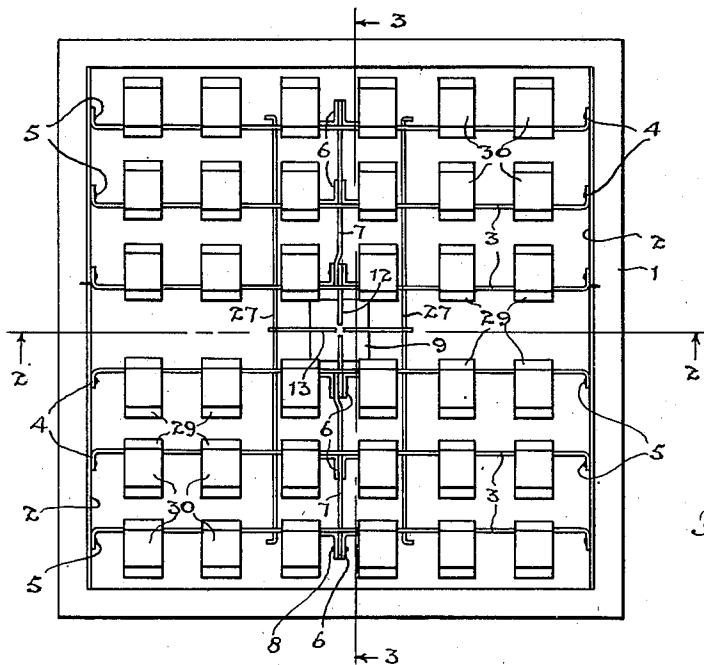


Fig. 1.

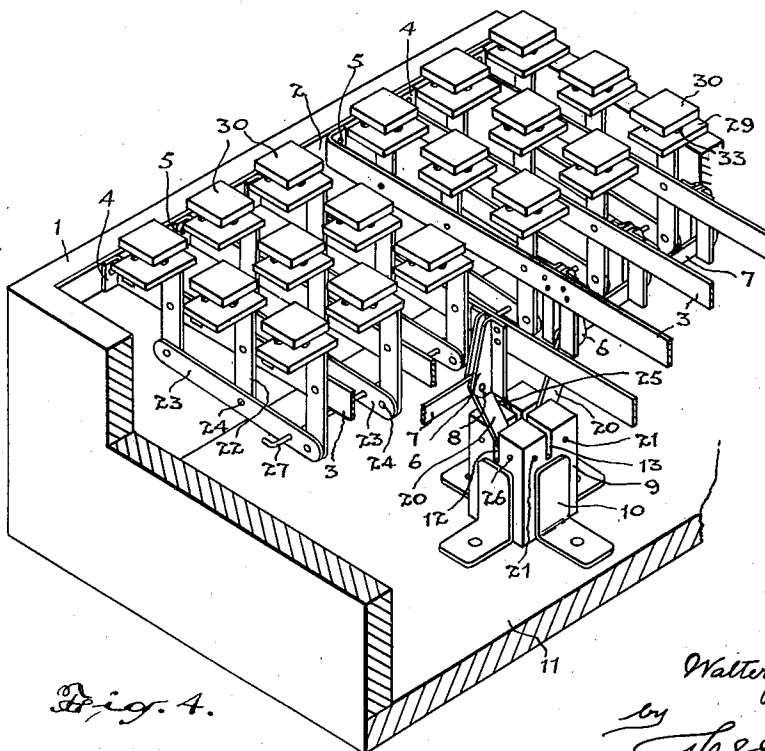


Fig. 4.

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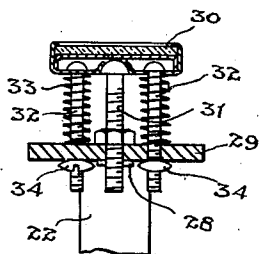
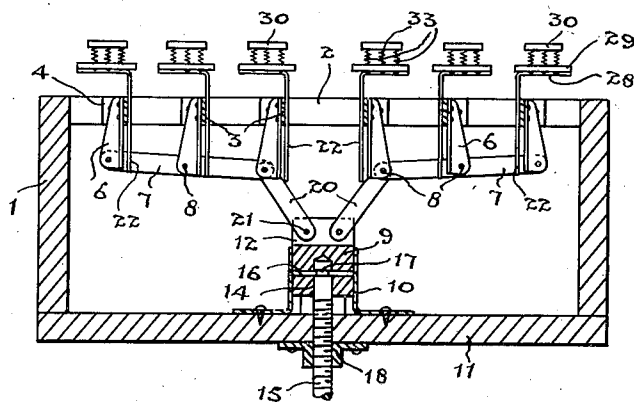
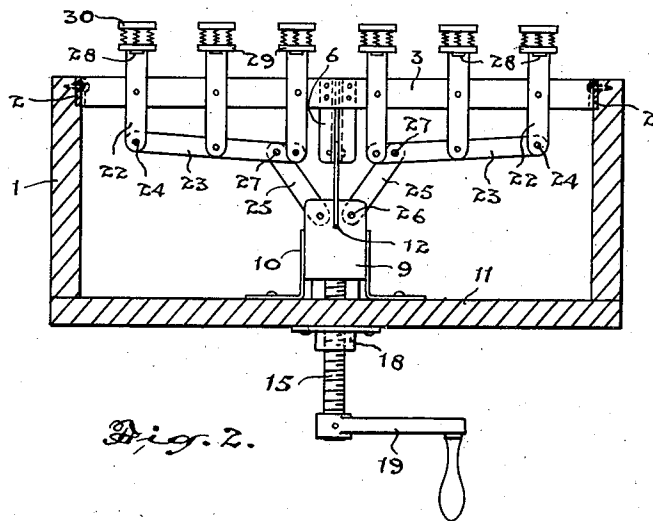
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UNITED STATES PATENT OFFICE

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REFLECTING AND FOCUSING APPARATUS
WITH PIVOTALLY ADJUSTABLE SPACED
APART REFLECTING MEMBERS FOR HEAT
AND LIGHT RAYS

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4 Claims. (Cl. 88—25)

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This invention relates to improvements in apparatus for the concentration of light and other rays for various purposes and particularly to concentrate such rays to transmit their energy to be applied directly for commercial and scientific uses where heat and power are required and the principal object of the invention consists in the utilization of the maximum amount of rays from a given area in the concentration of such rays to a focal area point to produce reactions of great intensity.

The principal feature of the invention consists in the novel manner of pivotally supporting a plurality of bars at their opposite ends within a frame and tilting the bars of opposing groups inwardly in unison and pivotally mounting upon the individual bars spaced-apart members and connecting such spaced-apart members to be tilted inwardly in opposing groups simultaneously with the inward tilting of their supporting bars, each of said individual pivotal members carrying a ray reflecting member

In the accompanying drawings Figure 1 is a plan view of a unit of a multiplicity of reflectors mounted to be operated in accordance with this invention.

Figure 2 is a vertical transverse section of my device taken through the line 2—2 of Figure 1.

Figure 3 is a vertical transverse section taken through the line 3—3 of Figure 1.

Figure 4 is a partial broken perspective view showing one half of the unit shown in Figure 1 with the central operating member.

Figure 5 is an enlarged vertical sectional view of one of the reflector members with its supporting elements.

The device as herein shown comprises an open box or casing 1 of rectangular form having metal bars 2 secured along the upper inside edges of two opposite walls.

A plurality of flat metal bars 3 substantially equally spaced apart and parallelly arranged extend across the casing and have their opposite ends turned laterally forming end lugs 4.

Each of the end lugs 4 are mounted to swing on pivot pins 5 secured in the side bars 2. Each bar 3 is provided centrally of its length with a pair of bracket lugs 6 which are spaced apart and extend below the lower edge of each bar 2.

Flat bar links 7 extend between the paired bracket lugs 6 and are pivotally connected thereto by pins 8.

A squared block 9 is vertically slidably mounted in a squared socket 10 mounted centrally on the bottom 11 of the casing 1 and the top of this block is formed with right angularly centrally crossing slots 12 and 13.

The block 9 is formed with a central cylindrical orifice 14 extending upwardly from the bottom

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and a spindle 15 extending upwardly through the bottom 11 is rotatably secured in said block by a cross pin 16 engaging a circumferential groove 17 in the upper end of said spindle.

The spindle 15 is threaded and is mounted in a threaded hole in a nut 18 arranged in the bottom of the socket 10 and when said spindle is rotated by the crank 19 attached thereto the spindle is caused to rise or fall.

Links 20 are pivotally mounted in the slots 12 on pins 21 extending across said slots in the block 9. These links extend angularly upwardly and outwardly and their upper ends are pivoted in the brackets 6 of the bars which are arranged adjacent to the block 9.

It will be understood that as the spindle 15 is rotated, the bars 3 on one side of the block 9 will, by reason of being connected together by the bars 7 and the brackets 6, be swung on their end pivots in one direction, while the bars 3 on the opposite side of the block will be swung in the reverse direction.

A plurality of short upright bars 22 are pivotally mounted intermediate of their length on the bars 2 and they are preferably equally spaced and form groups on either side of the centre line extending transverse to the bars 3.

The lower ends of the separate groups of bars 22 are connected together by bars 23 which are pivotally mounted on pins 24.

Links 25 pivotally connected to the connecting bars 23 each side of the centre block 9 extend angularly inward and downward and are pivotally mounted in the slots 13 in the block 9 on pins 26.

Rods 27 which form the pivotal connection of the upper ends of the links 25 to the bars 23 extend through the bars 23 connecting the upright members 22 mounted on each of the pivotal cross bars 3.

It will be readily understood that as the threaded spindle 15 is rotated, in addition to swinging the two groups of cross bars simultaneously in opposite directions on their end pivots the movement of the link members 25 and bars 23 will, through being connected by the rods 27, swing the two groups of upright members in opposing directions on their pivots on the bars 3.

Each of the upright bars 22 is formed with a laterally turned upper end which forms a lug 28 on which a plate 29 is mounted.

Mounted on and spaced from each plate 29 is a reflector 30. These reflectors are each adjustably mounted to be tilted on a pin 31 threaded in the plate 29 and three threaded pins 32 are pivotally connected to the base of the reflectors and held against coil springs 33 by nuts 34.

The reflectors 30 may be adjusted for tilt to any desired degree in an inward direction from

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either side of the casing as may be desired and after such adjustment is made the device may be operated by turning the spindle 15.

When the spindle 15 is turned the link connections 20 swing the two opposite groups of bars 3 on their end pivots and consequently the reflectors carried thereby are tilted inwardly toward a cross centre line parallel with the bars 3 and simultaneously the links 25 swing the upright member groups either side of the centre line transverse to the bars 3 in unison relative to such centre line.

The result of this double pivotal movement is that the reflectors are all tilted in two directions to the crossing centre lines and the light rays striking the inclined reflectors may be focussed to a central area of varying dimensions from practically a point spot to an area of considerable dimensions.

The result of this convergence of rays to a focal point is to concentrate the energy therein so that a very intensely energized area is produced and this may be such as to heat water converting it to steam in a suitable boiler, or to operate a furnace for the reduction of metal and other substances or for other use of the reflected energy.

The device may also be used quite effectively by less concentration for therapeutic purposes.

What I claim as my invention is:

1. A ray concentration device comprising, a frame, a plurality of parallelly arranged bars mounted in opposite sides of said frame to rotate on end pivots, bracket members extending downwardly from each of said parallelly arranged bars, a pair of bars arranged in substantially longitudinal alignment and each pivotally connected to the depending brackets of a group of said parallelly arranged bars and extending transversely thereof, links pivotally connected to the adjacent ends of the longitudinally aligned bars connecting said brackets, a block arranged midway between the adjacent ends of said longitudinally aligned bars between and below said grouped parallelly arranged bars and movable upwardly and downwardly and pivotally connected to said links to swing the parallelly arranged bars of each group in unison with the bars of one group swinging in opposite direction to the bars of another group, upright bars pivotally mounted in groups on each of said parallelly arranged bars and adapted to swing in planes parallel thereto, bars pivotally connecting the lower ends of the groups of upright bars and extending parallel the parallelly arranged and pivoted bars either side of said block, links pivotally connecting the bars of the latter group connecting bars either side of said block with said block to swing the groups of upright bars on their pivots simultaneously with the swinging of the parallelly arranged bars with the upright bars of one group swinging in opposite direction to the upright bars of another group, and reflectors mounted on the upper ends of said upright bars.

2. A device as claimed in claim 1 in which the links connecting the bars joining the upright members in opposed groups are pivotally connected to opposite sides of said block, and the links connected to the bars connecting the upright members in groups and connected to said block are arranged in right angular relation to the other links, means being provided to reciprocate said block toward and from said groups.

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3. A ray concentration device comprising a frame, a plurality of parallelly arranged bars extending between opposite sides of said frame and arranged to rotate on end pivots, bars extending transversely of and pivotally connected with said parallelly arranged bars and forming a pair of coupled groups of parallelly arranged bars, vertically slidable means arranged centrally of said frame between said parallelly arranged bar groups, links connected between said slidable means and said bars connecting said parallelly arranged bars in groups to swing said groups of parallelly arranged bars simultaneously toward or away from each other, upright bars pivotally mounted on said parallelly arranged bars to swing in planes parallel thereto, reflectors mounted on the upper ends of the upright bars, bars extending parallel said parallelly arranged bars and pivotally connecting the lower ends of said upright bars in coupled groups on each side of said central slidable means, and means connecting said slidable means and said latter connecting bars to swing same together with coupled groups of said upright bars and the reflectors carried thereby simultaneously towards or away from each other concurrent with the swinging of the aforesaid coupled groups of parallelly arranged bars.

4. A ray concentration device comprising a rectangular frame, a block arranged centrally of said frame and movable upwardly and downwardly of said frame, a plurality of parallelly arranged bars extending across said frame and pivoted at the ends thereto, a pair of bars arranged in substantially longitudinal alignment extending transversely of and pivotally connected with the parallelly arranged bars and terminating adjacent said block to form two groups of parallelly arranged bars one on each side of said block, links connecting the adjacent ends of said pair of bars with said block whereby movement of said block effects movement of said pair of bars in opposite directions to swing said groups of parallelly arranged bars in opposite directions, upright bars pivoted to each of said parallelly arranged bars, reflectors mounted on the upper ends of said upright bars, link bars extending parallel said parallelly arranged bars and pivotally connecting the upright bars on each of said parallelly arranged bars on each side of said block, rod means connecting the last-mentioned link bars on each side of said block, and link means connecting said rod means with said block whereby movement of said block effects movement of said upright bars on opposite sides of said block in opposite directions simultaneously with the swinging of said groups of parallelly arranged bars.

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