

M. LACHENMAIER.

Iron Fence.

No. 10,845.

Patented May 2, 1854.

Fig. 1.

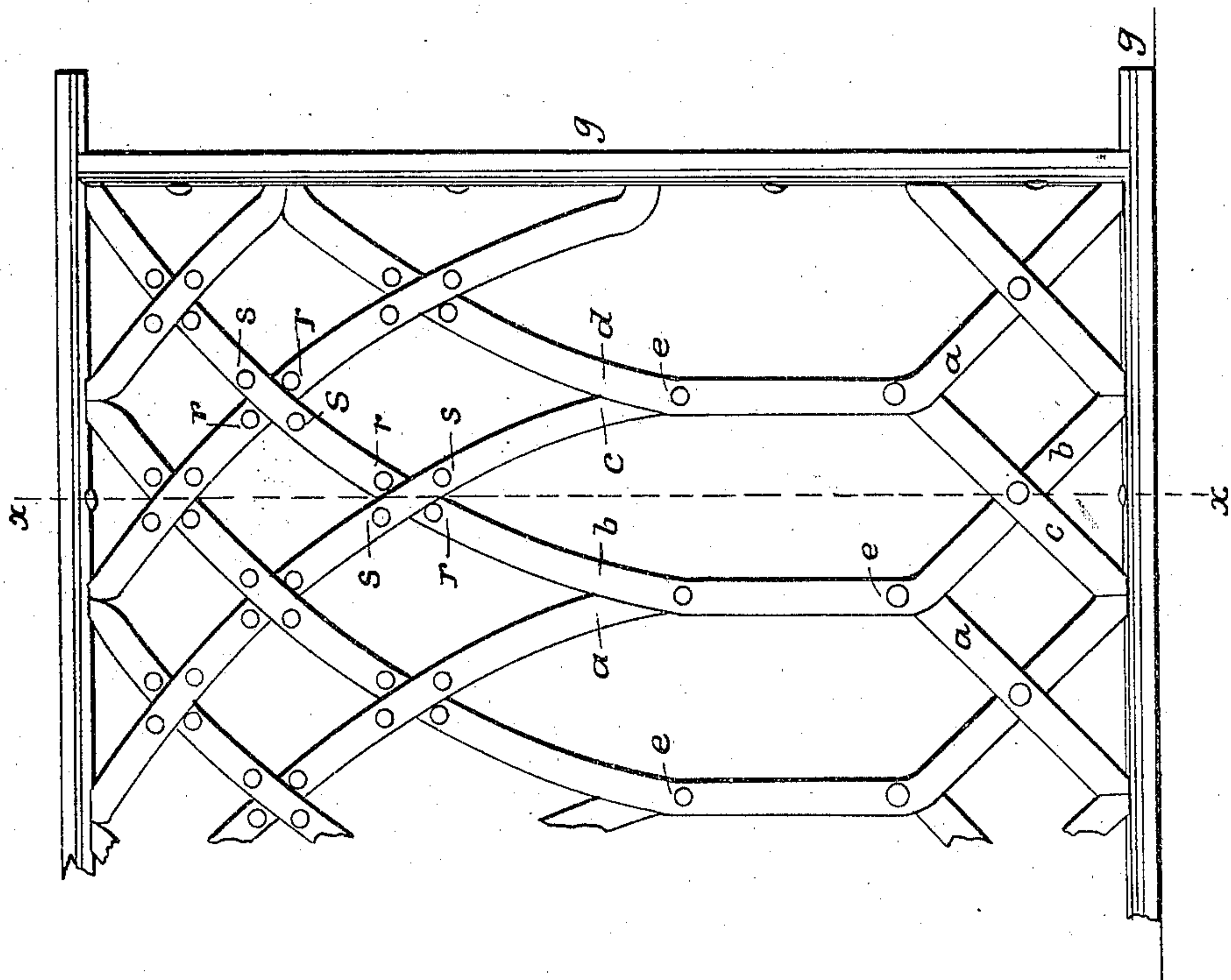
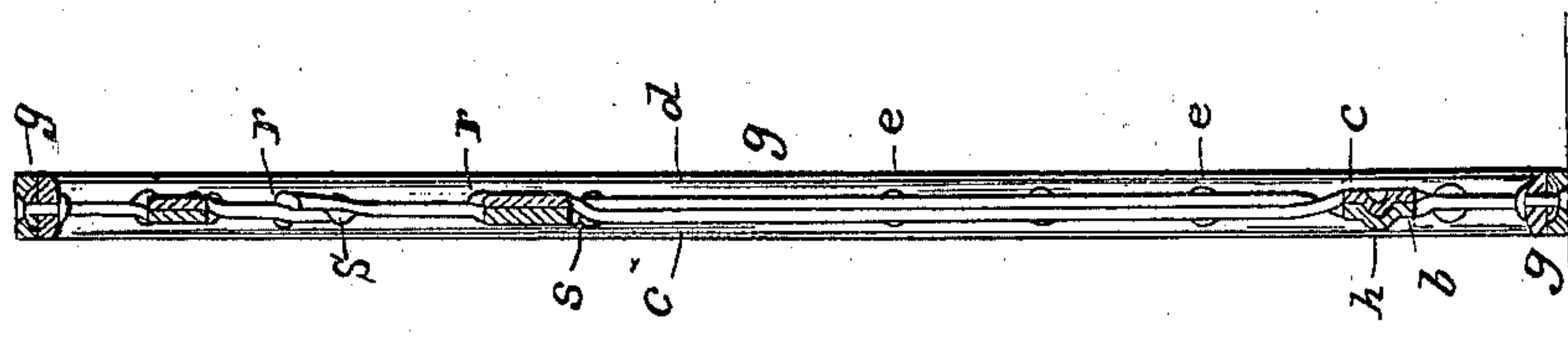


Fig. 2.





# UNITED STATES PATENT OFFICE.

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## DEVICE IN CONSTRUCTING STRAP-IRON RAILING.

Specification of Letters Patent No. 10,845, dated May 2, 1854.

*To all whom it may concern:*

Be it known that I, MATTHIAS LACHENMAIER, of the city and county of Philadelphia, in the State of Pennsylvania, have invented a certain new and useful Improvement in Railing Suitable for Fences, Gates, and other Purposes, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing, which forms part of this specification, and in which—

Figure 1 represents a face elevation of a portion of my improved railing and Fig. 2 a transverse section through the line  $x x$  in Fig. 1.

My improvement is applicable to what is called crimped wrought metal railing, that is railing in which the bars cross or lap alternately behind and in front of each other—that is, the bars forming the center or intermediate tie work—and are crimped or bent so as to fit one within the other, where they lap or cross, for the purpose of dividing strain or pressure, on any one bar over the several bars, without the cost, trouble and inconvenience of riveting or bolting the bars together at those points as is necessary to insure strength in railing having straight or flat bars running one behind the other, while a neater and more symmetrical aspect is given to crimped railing by reason of all the bars being in the same plane or level excepting at their crossing points where they are crimped. In a general way however the mere crimping of the bars does not form a sufficient tie either to prevent separate shake of the bars, nor unites them so that they will resist collectively upward downward or lateral strain or pressure applied to the railing, by reason of the curve form of the crimped surfaces, where the bars take their seats one upon or within the other, inducing them to slip out of gear with each other, so that it becomes necessary or is advisable to rivet the crimped portions of the bars together, though round wire crimped fencing is frequently used in which the crimps or bends alone are made to form the tie at the crossing points, but the curvature of the crimps is much deeper than could well be given to or would look well with flat bar railing which in a general way

is preferable to the wire form on account of its being bolder or more prominent especially when the railing is designed to be viewed at an extreme distance or height.

The railing represented in the accompanying drawing is formed of flat bars ( $a, b, c, d,$ ). These bars may be arranged to run in any suitable direction according to the design or pattern of the railing. As represented in the drawing, the bars are arranged to cross one another on the upper part or half of the face in curvilinear directions so as to give the aspect of a succession of Gothic arches projecting from vertical stems which are riveted together by rivets ( $e$ ) and cross diagonally at their feet the adjoining bars. The bars where they lap or cross one another alternately run behind and in front, they being crimped where they lap, but only slightly so, as the tie of the bars one to the other to withstand strain or pressure applied to them in direction of the plane or face of the railing is not dependent upon the bends or crimps, but is effected in a more reliable and stable manner, by means of projections and indentations made on and in them as follows. At those parts of the curved portions of the bars, giving the Gothic arched appearance referred to, where the bars lap or cross one another, and at distances apart corresponding with the width and distances apart of the bars, indentations are made so as to form studs or projections ( $r r$  and  $s s$ ) which jut in pairs alternately from opposite sides for either crimp or lap of the bars within or over each other, the one pair of studs ( $r r$ ) projecting in front by indentations formed in the back of the one bar while the other pair of studs ( $s s$ ) jut backwardly by indenting the bar from the front or face, the indentations being made in each instance at or about the extremities of the crimps or bends forming the lap and being made in an opposite direction to the bend or hollow of the crimp, so that, when the bars are fitted in their places and crimped to overlap, the studs formed by the indentations act as stops to restrain the bars from springing away from one another by strain or pressure applied in any direction of the plane or face of the railing, and in this respect act much more securely



and stably than if the tie of the bars were dependent alone upon the crimps or bends, the tie of the bars to resist such strain or pressure not being necessarily dependent in the least upon the crimps or bends and the said crimps or bends being no deeper than is necessary to cause the bars to overlap, so that the crimping is more easily effected and may, if preferred, be done when fitting the bars together in their places and uniting them, in any suitable manner, with the top, bottom and end single or compound rails (*g*) of the railing. The studs thus arranged acting as stops to the bars at their several edges of the lap will serve to divide strain or pressure between them and convey the effect of a shock more immediately over the several bars without crooking the crimp or bend or subjecting it to injurious strain.

Where the bars cross one another diagonally at the foot, the indentations are made in the centers of the crimps or bends, a single indentation for each crimp being sufficient and the indentations in the two bars crossing one another being made in the same direction so that the stud formed by the indentation of the outer bar fits into the cup or hollow of the indentation in the inner or back bar as seen more clearly at *h* in Fig. 2 of the drawing. This gearing of the studs one within the other serves to prevent the bars from slipping out of their crimps or bends and forms a center or starting point for fitting the bars together, room being afforded between the studs projecting from the curved portions of the bars to give the required exact shape or bend to the curved portions.

The straight portions or vertical stems of either two bars lying one against the other and uniting the upper curved portion of the railing with the diagonal bracing at the foot, instead of being secured together by rivets (*e*) as specified, may be united by studs formed by indentations and fitting one into the other as at the lap in the diagonal bracing; or where rosettes or similar ornaments are used to embellish the railing at the straight stem portion, both rivets and studs or indentations at that part may be dispensed with and the rosettes, fitting together in halves, be riveted through or on either side of each stem, as is now commonly done. A railing the bars of which are thus united or gear with each other by projecting studs formed by merely indenting the bars at suitable points will be sufficiently stiff and firm to withstand all ordinary strain or pressure, in whatever direction it be applied, without the aid of bolts or rivets tying the laps, and be much more expeditiously made than if rivets were used as the indentations in the bars forming the studs may be made by hand at a single blow by hammer and punch, or the bars

may be indented and crimped, also, if desired, bent, by any suitable arrangement of machinery for that purpose and this will be found the more expeditious way to make a large quantity of railing of one style or pattern, such machinery being made adaptable to other forms or patterns, that is, to give a different bend or bends to the bars and a larger or less number of indentations at different distances apart according to the widths of the bars and the spaces between them and the varied directions in which the bars require to be arranged to run to suit a particular pattern, my improvement being applicable to any style or pattern in which the bars are crimped and lap one another.

A railing thus constructed may not only be got up cheaply and expeditiously and a better tie to withstand strain or pressure be secured than where the crimps or bends of the laps alone form the bearing surfaces or supports of the one bar upon the other, but, in addition to the facility of construction afforded by the slight crimp or bend of the thin flat bar to establish the lap (and which may be done without subjecting the bars to any previous crimping process by merely slightly bending them in forming the lap when fitting the bars together) a much more level and symmetrical appearance is given to the railing than is the case in other railing having bold or permanent crimps, as, for instance, in the ordinary crimped wire fence which for a variety of purposes is of too airy or light a style to have the desired effect. The studs or indentations which, in my improved railing, from the supports for the bars one upon the other are scarcely visible at a distance and in no way serve to destroy the level or flat aspect the railing generally is made to present.

What I claim as new and useful, and desire to secure by Letters Patent, is—

The manner herein described of constructing and fitting together crimped wrought metal railing, by constructing the cross bars at the extremities of their crimps or bends with punched or pressed studs (*r r* and *s s*) projecting,—either successive pair in each bar,—in opposite directions alternately, to form supports or stops to the bars on either side or edge of their crimps and on both sides or faces of the railing, to prevent the bars from slipping out of their crimped bearings or from out of line with them, also to relieve the crimps from injurious strain and to divide strain, jerk or pressure, applied to the railing or to one or more bars, over the several bars; whereby time and labor are economized in fitting together the railing, a simple and strong double cross tie of the bars at their several crimps is obtained, and whereby a flatter crimp, without the usual adjuncts of bolts or rivets



for tying the bars together, may be used,  
as specified; the said cross bars at one of  
their crimps or bends either being made with  
or without a center stud fitting into a cor-  
5 responding indentation in the adjoining bar  
(as at *h*, Fig. 2) to serve as a starting point  
or center for fitting the bars together and  
to hold them in their crimps, substantially  
as specified.

In testimony whereof, I have hereunto  
subscribed my name.

M. LACHENMAIER.

Witnesses:

GEORGE ACKERMANN,  
JOSEPH STUBER,  
C. BRAZER.