

C. Mettman.

Iron Shutter.

N^o 12,281.

Patented Jan. 23, 1865.

Fig. 1.

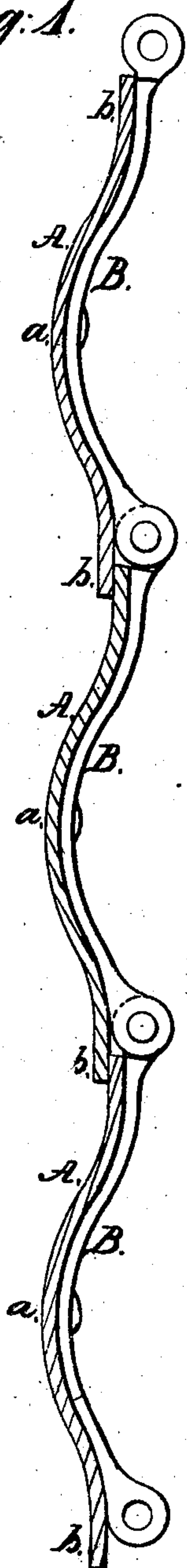


Fig. 2.



UNITED STATES PATENT OFFICE.

CHARLES METTAM, OF NEW YORK, N. Y.

ROLLING IRON SHUTTERS.

Specification of Letters Patent No. 12,281, dated January 23, 1855.

To all whom it may concern:

Be it known that I, CHARLES METTAM, of the city, county, and State of New York, have invented a new and useful Improvement in Rolling Iron Shutters; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1, is a section of part of a shutter constructed according to my invention. Fig. 2, is a section of one of the slats, and Fig. 3, is a section of a slightly modified plat.

Similar letters of reference indicate corresponding parts in the several figures.

My improvement has reference to that class of metal shutters formed of a continuity of slats, usually flat or straight, hinged or otherwise equivalently united together in such a manner that the whole sheet of slats composing the shutter may be rolled upon and unrolled off a drum or roller arranged in any suitable position for that purpose; and my invention consists in giving to the slats of such shutters a peculiar configuration whereby certain new and useful results or improvements in that form of shutter are effected as will hereinafter appear.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and effect.

A, A, are the slats which are made of plate iron swaged or rolled out or otherwise wrought to give the central part from end to end, the form of an arch, *a*, of which the convexity is on the exterior surface. The arch may be united with the flat parts *b*, *b*, which form the lap and are both in the same plane, by a gradual curve as shown in Fig. 2, or by an angle, as shown in Fig. 3, either of which forms may be employed with nearly the same advantage. The hinges or links B, B, have the same form as the slats, in order that they may fit closely thereto, but otherwise are substantially similar to the chain hinges or links employed with the flat slats of the rolling iron shutter now in common use.

In the employment of iron shutters of this description with slats of the common flat form, great difficulty is experienced in the want of proper stiffness to resist pressure on the outer side, and in many instances windows have been broken by such pressure. The only method heretofore suggested, of

remedying this disadvantage, has been to increase the thickness of the slats which would make the entire weight of the shutter too great to be rolled up or raised conveniently. It has been long considered desirable to make rolling iron shutters which would roll horizontally upon a vertical roller, but the attempts to accomplish that have been practically unsuccessful, owing to the want of stiffness in the flat slats usually employed. Slats of other form have been employed, partly with a view to remedying the above disadvantages; as for instance, they have been hinged together with a curl on the edge of each slat, but a shutter composed of such slats is not capable of rolling into the same small compass as one made of flat slats with chain hinges, and when unrolled, though stiffer lengthwise of the slats, has not as great a stiffness transversely to the slats.

In a rolling shutter, which as before observed is the kind of shutter my invention is limited to, my improved form of slat possesses the following peculiarities and advantages. Deflection of the slat will be effectually restrained and the necessary stiffness insured to admit of the shutter being rolled up horizontally on a vertical roller, and, from the well known superiority of the arch, as a form, in resisting strain or pressure, it is obvious that, not only may the slats be made of less thickness of metal—thereby reducing cost—than the flat or straight form of build, to possess equal or greater strength, and thus the weight of the shutter be diminished and the labor of rolling the shutter up—which is an important consideration—be proportionally lessened; or if made of the same thickness and weight of metal as the ordinary flat slat build, the capability of the shutter to resist outward strain or pressure be largely increased; but, by the arrangement of the protruding arch in the center of the slat, the strongest portion of the form will be at or about the middle of the slat, where, irrespective of the shape, the slat naturally is weakest, and strain or pressure, applied externally to the shutter across the slats, will be borne or met by the crowns of the arches (*a*) midway or nearly so between the points of rest or bearing of the slats where they lap on and are hinged to each other at their flattened edges (*b*), and thus the strain be equally divided over the entire width of the slat between the joints, hinges or points of rest, which would not be

the case were the slats of "ogee" (S), or double curved form, as has been proposed or adopted for blinds in which the slats were made vibratory, being each of them separately hung on a central stationary axis, and which slats when closed exposed a protruding arch for the one half of their width at one side and a hollow or reverse form of arch for the other half, thereby subjecting the slat to an unequal division of the strain across its entire face or surface on outward pressure being applied to the blind, and which ogee form of slat, also, does not present the same broad lap or bearing surface, the one slat upon the other, to exclude dust, rain, dirt et cetera, as my improved form of slat, on its flattened edges (*b b*) and as the ordinary flat or straight slat in use does; nor would such a double curved form (S) of slat be convenient for a rolling shutter (for which it never was designed), as such a form of slat would occupy too much space in rolling up, by reason of the reverse form of either half of the slat preventing the slats from lying snugly over, on, into or against each other; whereas, with my improved form of slat, every facility for rolling up in a small compass is afforded, as the slats will fit, for a large portion of their breadth, snugly into each other on the roll, and on this account and owing to their diminished thickness by reason of their form, they may be made to roll up in a smaller compass than the flat or straight slat which, as the roll increases in size, "break joint" with the under slats so as to cause the outer slat in its rest on the under ones to take but a moderate bearing and leave large open spaces, subjecting the slat to injurious strain as the other slats roll on it. Thus it will be seen that, by the peculiar central arched form (*a*) with flattened edges (*b*) I give the slat, the facility for rolling up the shutter in a small compass is in-

creased; it has the same advantage, as regards lap, in excluding dust, dirt et cetera, as the flat slat, and by increasing the strength of the shutter renders it less liable to injury also better protects the window from being broken by outside pressure applied to the shutter, likewise, by admitting of the slats being made lighter, reduces cost and, what is of more importance, greatly reduces the labor of rolling up the shutter.

I do not claim as new, or irrespective of the relative position of the protruding arch and the description of shutter to which the described form of slat refers, giving a slat a curved or arched form to increase strength, as a different disposition of the protruding arch and combination of curves have before been used in blinds otherwise arranged than to roll up. Nor yet do I claim as new, in itself, causing the edges of the slats in rolling shutters to have a broad flat bearing or lap, the one over or upon the other to exclude dust et cetera, as the ordinary flat slat rolling shutter possesses that feature: but

I do claim, as a new and useful improvement in the rolling metal shutter, operating as described,

Making the slats of the form substantially as herein specified; that is to say, with an exterior protruding arch (*a*) at their center combined with flat laps or bearings (*b*) at their edges, the slats being arranged in relation to each other and united together essentially as set forth; by which configuration, the shutter may be rolled up in a less compass, the labor of rolling up reduced and the many other advantages herein set forth obtained.

CHAS. METTAM.

Witnesses:

O. D. MUNN,
I. G. MASON.