(No Model.)

F. W. GATES.

SECTIONAL LADDER.

No. 336,227. Patented Feb. 16, 1886.

Fig. 1.

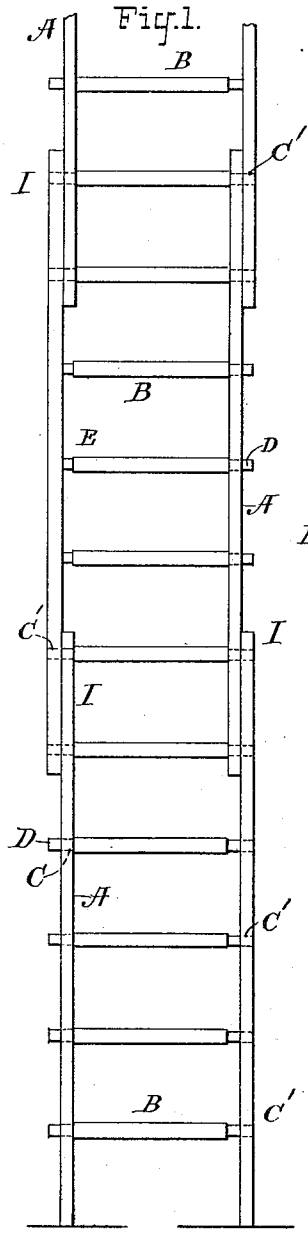
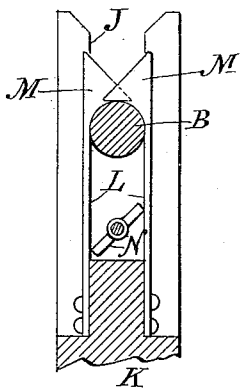


Fig. 2.



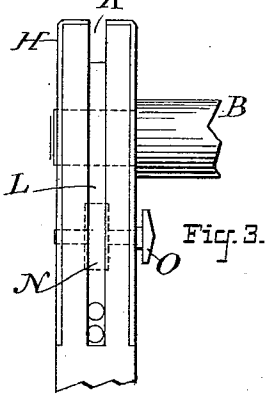


Fig. 3.

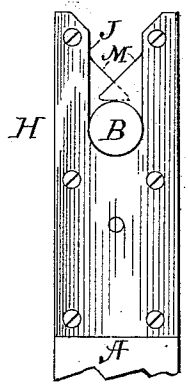
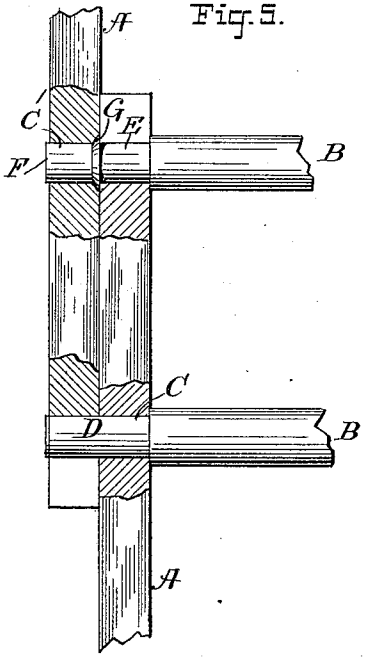


Fig. 4.

Fig. 5.



WITNESSES:

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UNITED STATES PATENT OFFICE.

FRANK W. GATES, OF NEW YORK, N. Y., ASSIGNOR TO THE EMERY-GATES SECTIONAL LADDER AND MANUFACTURING COMPANY OF NEW YORK.

SECTIONAL LADDER.

SPECIFICATION forming part of Letters Patent No. 336,227, dated February 16, 1886.

Application filed December 12, 1885. Serial No. 185,429. (No model.)

To all whom it may concern:

Be it known that I, FRANK W. GATES, a citizen of the United States, and a resident of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Sectional Ladders, of which the following is a specification.

The invention includes valuable and patentable features having reference to certain important improvements in the form, combination, and disposition of the several elements composing the invention and necessary to its operation.

The invention includes also all the uses and applications to which it may be applied; but all such uses are not enumerated, as it is evident that the party controlling the patent may devote the invention to any purpose now or hereafter proposed.

My invention relates to a simplified form of sections for sectional ladders, to the location of projections and notches upon said sections, and to a fastening device for retaining in a rigid condition the several sections, so as to form a long ladder, a platform, or an ordinary step-ladder.

The object of my invention is to provide a ladder which is adapted to be built up of sections, each having parallel sides and all of the same width. In order to effect this result, I have met many difficulties until the idea arose of making projections upon the outer side of one side rail and notches upon the rungs adjacent to the inner side of the opposite side rail. By this very simple construction sections of equal width and having parallel sides can be built into all the forms of ladders imaginable.

In order to illustrate the practical manner of carrying out the invention, and to enable others skilled in the art to which the invention appertains to make and use the same, drawings are hereunto annexed and described, in which similar letters represent corresponding elements, and in which each part referred to is designated by a single character. Those parts not mentioned are not claimed in this the present application. The materials of construction employed, the exact forms of design, and the proportional dimensions are not alluded to in every instance, as they are best determined upon by engineers in the art.

Figure 1 shows a ladder built up of sections; Figs. 2, 3, and 4, the fastening device for holding the sections together, and Fig. 5 a cross-sectional view of one of the details of construction.

The construction, as exhibited in Fig. 1, consists of the combination of duplicate sections having parallel side rails, A, projections D of rungs B along the outer side of one of said side rails, and notches E in the rungs adjacent to the inner surface of the other side rail.

Some of the details embodying my invention are as follows: The joints I between the sections each consist of a side rail; a slot, J, in the end of said side rail; a rung, B, fitting into said slot; a second slot, K, at right angles to the first-named and containing springs L, adapted to be sprung back into said second slot, said springs having hooks M, which spring over said rung, and a rotatable lever, N, between said springs and adapted to be pressed against the same, so as to push their upper ends having the hooks M into the second-named slot, K.

In Fig. 5 the construction consists of the combination of the side rails, A, rungs B therefor, and holes C and C′ in said side rails, each rung having upon one end a smaller portion, D, fitting into the holes in one side rail and projecting beyond the same, and having upon the other end two smaller portions—an inner, E, and an outer, F—separated by a beveled collar, G, said outer smaller portion and said collar fitting into the holes C′ in the other side rail. A plate of metal, H, is bent over the end of each side rail and secured thereto by screws. When any two sections are put end to end and pushed together, the springs L are pushed apart by the rung B entering the slot. The hooks M retain the sections in position and prevent their being pulled asunder until the lever N is rotated by means of the button O, when the hooks M recede from the rung B into the slot K and permit the removal of the rung B, and therefore the taking of the ladder apart.

The invention is not limited to the precise

construction hereinbefore described, as it is evident that many modifications may be made therein without departing from the spirit of the invention. For example, one of the hooks M may be omitted. The lever N may be replaced by any mechanism which will serve to liberate the hooks M from holding the rung B. The collar G need not have such a steep slope, but may slope gradually to the outer end of the smaller portion, F.

Heretofore ladder-sections adapted for building long straight ladders have been of almost any shape, except that which has herein been described. In some the side rails have tapered toward each other; in others the side rails of each section have been parallel, but alternate sections were of different widths; in others the side rails have been parallel at and near both ends, but curved or tapered at and near their centers; in others the sections have each been smaller toward the top of the ladder until the ladder terminates in a point.

Having now stated the title, object, and relation of the said invention, having described its practical realization by reference to the accompanying drawings, having particularly ascertained the manner in which the same operates to accomplish the said object, and, further, stating that it is not necessary to state all the uses to which the invention may be applied, what I consider to be novel and original, and therefore claim as my invention, secured to me by the hereinbefore-in-part-recited Letters Patent of the United States, is—

1. A sectional ladder formed of the combination of duplicate sections having parallel side rails, rungs projecting beyond one of the side rails of each section, grooves upon the opposite ends of the said rungs and adjacent to the other of the side rails of each section, and slots in the ends of said side rails, the said rungs fitting into the said slots.

2. In a sectional ladder, the combination of duplicate sections having parallel side rails, projections along the outer side of one of said side rails, notched pieces along the inner side of the other of said side rails, and slots in the ends of said rails and fitting over said projections and upon said notched pieces, substantially as described.

3. In sectional ladders, a section consisting of the combination of side rails, holes in said side rails, and rungs to said ladder, each rung having upon one end a smaller portion fitting into the holes in one side rail and projecting beyond the same, and having upon the outer end two smaller portions—an inner and an outer—separated by a beveled collar, said outer smaller portion and said collar fitting into the holes in the other side rail, substantially as described.

4. In sectional ladders, the combination of side rails, slots in the ends of said side rails, projections upon one side of said side rails, said rungs and their projections fitting into said slots, and an automatic locking device in said slots, substantially as described.

5. In sectional ladders, a joint consisting of side rails, slots in said side rails, rungs fitting into said slots, hooked springs sprung over said rungs, and an operating device consisting of a rotatable lever between said springs, substantially as described.

In testimony whereof I hereunto subscribe my name, in the presence of two subscribing witnesses, this 8th day of December, A. D. 1885.

FRANK W. GATES.

Witnesses:
DAVID W. PRICE,
JOSEPH PARKER, Jr.