

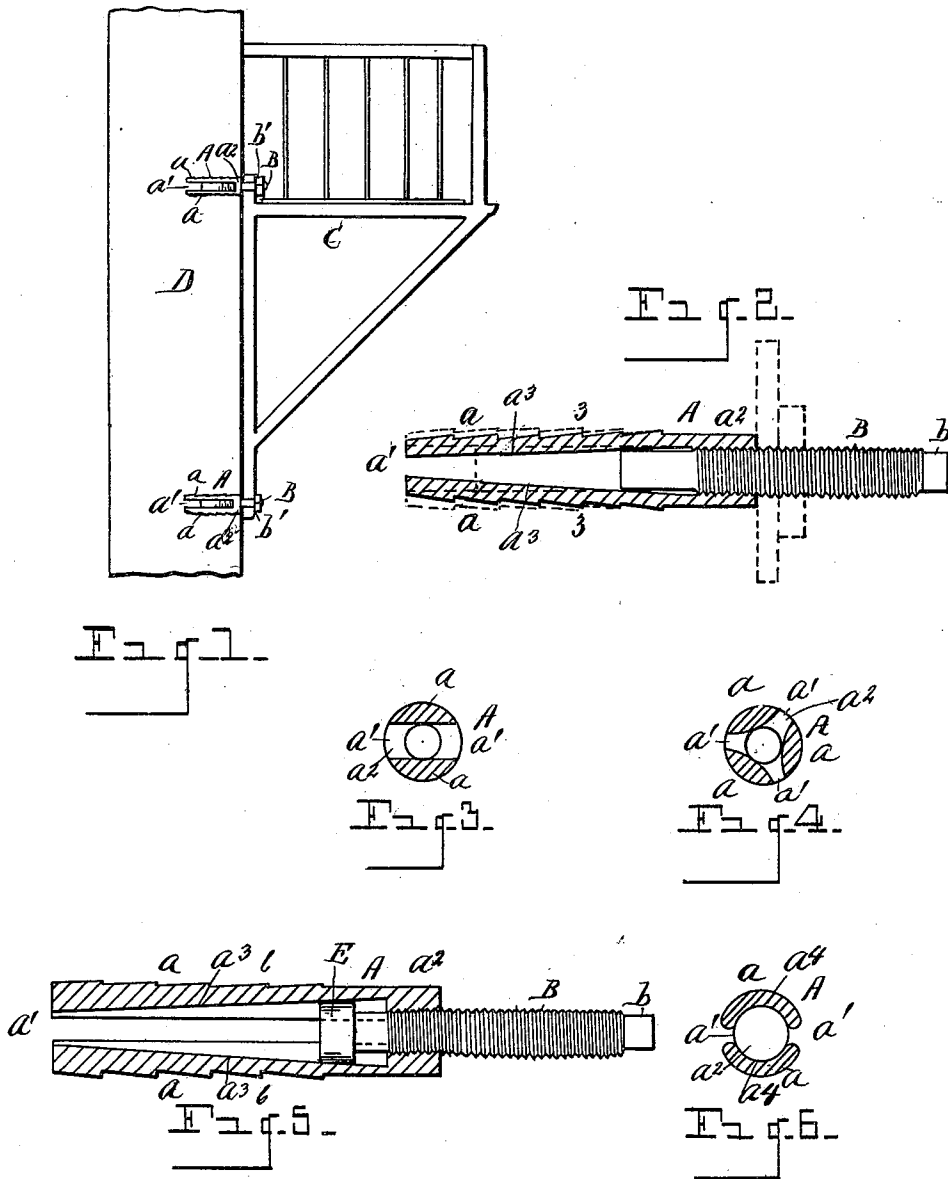
No. 623,809.

K. & V. McCREERY.
EXPANSION BOLT.

Patented Apr. 25, 1899.

(Application filed May 5, 1898.)

(No Model.)



WITNESSES.

O. H. Berger
Mary Hickey

INVENTORS.

King McCreery
Vance McCreery
By Newell Wright
Attorney

UNITED STATES PATENT OFFICE.

KING MCCREERY AND VANCE MCCREERY, OF TOLEDO, OHIO.

EXPANSION-BOLT.

SPECIFICATION forming part of Letters Patent No. 623,809, dated April 25, 1899.

Application filed May 5, 1898. Serial No. 679,774. (No model.)

To all whom it may concern:

Be it known that we, KING MCCREERY and VANCE MCCREERY, citizens of the United States, residing at Toledo, county of Lucas, State of Ohio, have invented a certain new and useful Improvement in Expansion-Bolts; and we declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

Our invention has reference to an expansion-bolt of novel construction; and it consists of the devices described in the specification and illustrated in the accompanying drawings, in which—

Figure 1 is a view in side elevation and vertical section, showing our improved device in place. Fig. 2 is a view of the device in longitudinal section. Fig. 3 is a cross-section of Fig. 2 on the line 3 3. Fig. 4 is a cross-section illustrating a modification of the invention. Fig. 5 is a longitudinal section illustrating a modification of the invention; and Fig. 6 is a view in cross-section on the line 6 6, Fig. 5.

The utility and desirability of an efficient expansion-bolt are well understood. Our invention is designed to provide a device of this character of superior simplicity and utility.

We carry out our invention as follows:

A indicates a ferrule constructed with two or more expansion-jaws *a*, said ferrule being kerfed or longitudinally slotted between the adjacent edges of said jaws, as indicated at *a'*, said jaws, however, integrally uniting at their forward ends with an interiorly-threaded collar *a*², forming the forward end of said ferrule. B is a threaded device—as a bolt, for example—having a threaded engagement within said collar. The inner faces of the jaws *a* are normally made wedge-shaped and tapering from the collar toward the opposite ends of the jaws, as indicated at *a*³, the space therebetween normally narrowing toward the inner extremities of said jaws, so that when the threaded device or bolt B is forced within the ferrule the inner end of said bolt, forced against the angular or wedge-shaped faces of said jaws, will expand the inner ends of said jaws. The ferrule may be made of any suit-

able material—as of malleable iron or brass, for example—permitting said jaws to yield when the bolt is forced within the ferrule.

Expansion-bolts have been employed, for example, to attach various devices to brick-work. An example of the use of said bolts is shown in Fig. 1, where a fire-escape C is attached to a solid wall D. Difficulty has been found with expansion-bolts heretofore constructed, where the bolt is made to expand at the forward or outer end or uniformly throughout the whole length of the device engaged in the solid wall, for the reason that where the bolt is expanded throughout or at the forward or outer end it has been found very liable to become disengaged and to be pulled out of the wall. Our improved device is constructed and arranged, it will be seen, to expand only at the rear or inner end of the ferrule, said jaws being arranged to expand at their inner or rear ends, while the forward end of the ferrule is not made expandible. It will be evident that by forcing the threaded device B within the ferrule the jaws are expanded or forced outward at their rear or inner ends, while the forward end of the ferrule remains unexpanded.

In Figs. 2, 3, 5, and 6 the ferrule is shown constructed with two expandible jaws, while in Fig. 4 three expandible jaws are shown. We would have it understood that we contemplate constructing the ferrule with any desired number of expandible jaws. In Fig. 5 a modification is shown in which an expansion wedge or block E is employed, located within the expandible jaws and arranged to be forced rearward when the threaded device B is forced within the ferrule. In this case the inner surface of the jaws may be concaved, as indicated in Fig. 6 at *a*³, to assist in holding the block E in place. Our invention contemplates the employment of any suitable device in connection with the ferrule to expand the rear or inner ends of said jaws, while the outer or forward extremity of the ferrule remains unexpanded.

The threaded device or bolt B may be squared or otherwise constructed, as indicated at *b*, for the engagement of a wrench therewith to force the bolt within the expandible jaws, and may also be provided with a nut (indicated at *b'*) to hold the device in place.

The collar α^2 being in a single integral piece and integral with the jaws obviously cannot expand when the bolt is forced into it.

Figs. 2 and 5 of the drawings show the outer surfaces of the jaws corrugated; but we do not limit ourselves to any specific form of the outer surfaces thereof. The corrugations are employed to facilitate the device being held in place.

The drawings show the normal outer diameter of the jaws at their extremities opposite the collar not to exceed the diameter of the collar, and in Fig. 2 is shown a construction wherein the normal outer diameter of the jaws at their extremities opposite the collar is narrower than the collar, the outer surfaces of the jaws normally tapering from the collar toward the opposite ends thereof. The outer surfaces of the jaws are also shown corrugated on their exterior, the corrugated surfaces of said jaws being constructed and arranged to contact with an adjacent wall of a receiving-orifice when the jaws are expanded substantially the whole length of the jaws, so that an equal pressure will be exerted by the jaws against the walls of the receiving-orifice the whole length of said jaws. Having the outer surfaces of the jaws constructed to contact with the wall of an outside structure in which the jaws are engaged substantially the whole length of the jaws is an important feature, inasmuch as such a construction serves to prevent lateral vibration and to communicate the strain of the jaws upon said walls the whole length of said jaws. Moreover, by making the normal diameter of the jaws at their ends opposite the collar not to exceed the diameter of the collar we avoid any necessity of enlarging the inner end of the orifice in the structure to which our improved bolt is applied. By getting a strain of the arms against the walls the full length of the arms the outer material is prevented from chipping off, and the expansion device is also prevented from working loose in case of lateral strain of any kind. Thus our device can be used, for example, in engine foundations for the purpose of securing the engine so as to prevent vibration.

What we claim as our invention is—

1. An expansion-bolt having in combination a ferrule provided with expansible jaws integrally united at one end and made wedge-shaped on their inner faces, the inner faces of said jaws tapering from the integrally-united

ends thereof toward the opposite ends of the jaws, and means for expanding said jaws, the normal outer diameter of said jaws at their extremities opposite the collar not exceeding the diameter of said collar, substantially as set forth.

2. An expansion-bolt having in combination a ferrule provided with an internally-threaded collar at one end, expansible jaws integrally united to said collar and made wedge-shaped on their inner faces, and a threaded device engaged with said collar to project between said jaws to expand the jaws, the inner surfaces of said jaws tapering from the collar toward the opposite ends thereof, and the outer surfaces of said jaws normally tapering from the collar toward the opposite ends thereof, substantially as set forth.

3. An expansion-bolt having in combination a ferrule provided with an internally-threaded collar at one end, expansible jaws integrally united to said collar and made wedge-shaped on their inner faces, and a threaded device engaged with said collar to project between said jaws to expand the jaws, the outer surfaces of said jaws corrugated on their exterior, the corrugated surfaces of the jaws arranged to contact with the adjacent walls of a receiving-orifice, when expanded, substantially the whole length of the jaws, whereby an equal pressure will be exerted by the jaws the whole length thereof upon an outside structure with which the jaws are engaged, substantially as set forth.

4. An expansible bolt having in combination a ferrule provided with expansible jaws, an internally-threaded collar integrally uniting said jaws at one end thereof, a threaded device engaged with said collar, and a wedge or block between said jaws to be forced away from the collar by said threaded device to expand said jaws, said jaws made wedge-shaped on their inner faces, the inner faces of the jaws tapering from the collar toward the opposite ends thereof, the normal outer diameter of said jaws at their extremities opposite the collar not exceeding the diameter of said collar, substantially as set forth.

In testimony whereof we sign this specification in the presence of two witnesses.

KING MCCREERY.

VANCE MCCREERY.

Witnesses:

GEO. JENNINGS,

LYMAN W. WACHENHEIMER.