W. BORRMAN.

PIPE ELBOWS.

No. 190,273. Patented May 1, 1877.

FIG. 1.

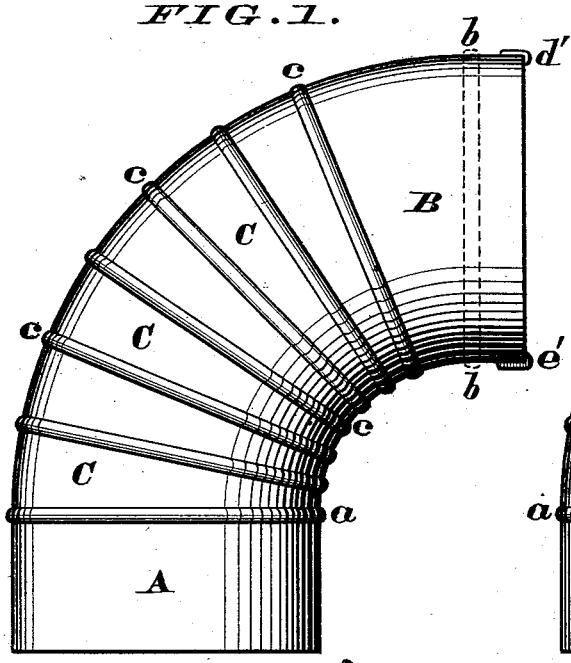
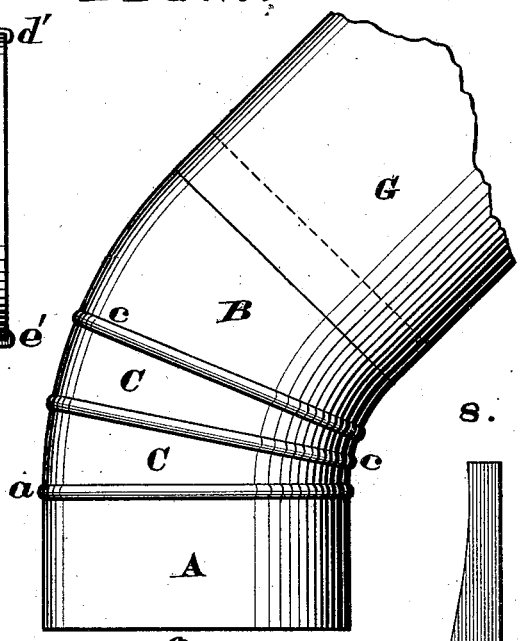


FIG. 2.



8.

FIG. 5.

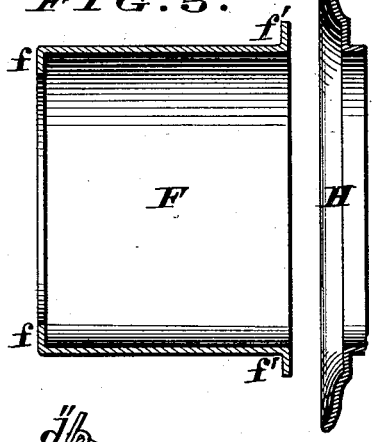


FIG. 6.

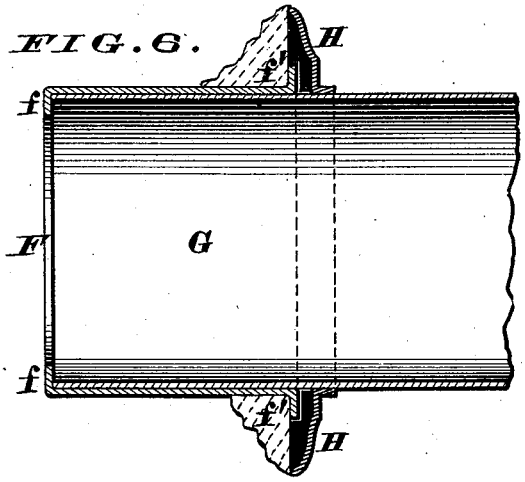


FIG. 3.

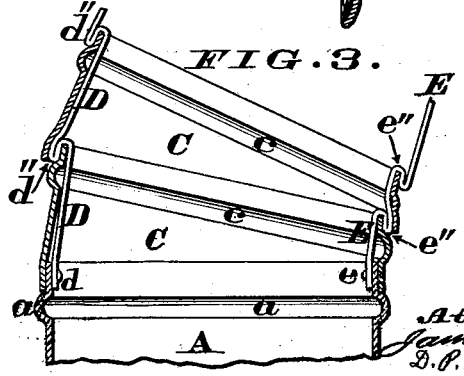
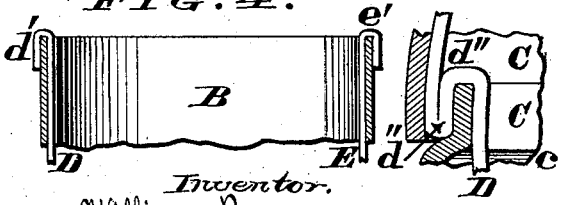


FIG. 4.



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WILLIAM BORRMAN, OF CINCINNATI, OHIO.

IMPROVEMENT IN PIPE-ELBOWS.

Specification forming part of Letters Patent No. **190,273**, dated May 1, 1877; application filed February 21, 1877.

To all whom it may concern:

Be it known that I, WILLIAM BORRMAN, of Cincinnati, Hamilton county, Ohio, have invented certain new and useful Improvements in Pipe-Elbows, of which the following is a specification:

This invention relates to that class of elbows which are composed of a series of sheet-metal rings or sections; and my improvements consist in uniting the various rings together in such a secure manner as to insure a perfectly rigid and unyielding elbow, while at the same time one or more sections can be readily detached whenever it is desired to change the angle of the discharging end of the smoke-pipe.

The ordinary sectional elbows are generally made with a quarter-bent, and the various rings or segments are riveted to each other, thus rendering it necessary to call in the assistance of an experienced artisan when it is desired to change the angle or pitch of the discharging end of the pipe, and even then the elbow is sprung and bent by the violent treatment it is subjected to in removing the rivets.

My sections, however, are not riveted together, but are maintained in their proper relative positions by one or more bands, or straps, or wires, or other suitable binders, located on the inside of the elbow, and disposed longitudinally of the same.

These binders are riveted at their lower ends to the lower end section of the elbow, while the other extremities of said bands or binders are clinched or bent down firmly against the upper end section, thus locking all the component members of the elbow securely together. In order to afford a still more secure lock to the elbow, these binders are crimped into the laps or joints of the sections, said crimps being located at every joint, or at alternate joints, or other appropriate intervals.

Now, it is evident that by simply bending back the clinched extremities of said binders the upper end section can be readily disengaged from the ring to which it was applied, and then any number of said rings can be removed until the proper pitch or inclination is obtained.

This act having been accomplished, the upper end section is again applied to the elbow and securely attached thereto by forming new clinches in the binders' free ends.

In the annexed drawings, Figure 1 is a side elevation of my complete elbow, having the customary quarter-bend. Fig. 2 is another elevation, but showing the elbow shortened to impart an upward pitch or inclination to the discharging end of the stove-pipe. Fig. 3 is an enlarged axial section through the lower sections of the elbow. Fig. 4 is a similar section through the upper joint of the same. Fig. 5 is an axial section through the thimble and collar of the elbow, the thimble and collar being separated from each other. Fig. 6 is a similar section, but showing the collar, thimble, and stove-pipe united together. Diagram 7 represents, on an enlarged scale, the method of locking or crimping one of the binders at the lap or joint of two contiguous sections of my elbow; and Diagram 8 represents one of the blanks previous to being formed into a ring, and riveted so as to constitute one of the smaller or intermediate sections of the elbow.

My elbow consists, essentially, of a lower end piece, A, an upper end piece, B, and any suitable number of intermediate sections or segments, C, all of these component members being made of sheet-iron or other appropriate metallic plates, and so coupled together by means of an internal binder or binders as to be readily detached one section from the other without injuring the elbow, or necessitating the use of tools or implements of any kind.

The section A is almost a perfect cylinder, being but slightly diminished in diameter at its upper end, in order that it may readily slip into the adjacent section C, the length of the lap or joint between these two members A C being determined by the location of bead *a* of said lower section of the elbow.

The upper end section B may be furnished with a precisely-similar bead, as indicated by dotted lines *b* in Fig. 1, so as to regulate the lap between said end section and that joint of the stove-pipe which is applied thereto; but this bead *b* may be omitted, if desired.

The various intermediate sections, rings, or segments C are formed out of blanks having the shape shown in Diagram 8, the beads *c*

being rolled in parallel with the straight edge of said blank, and after the latter has been bent into the proper tubular form and riveted. These beads *c* serve to gage the lap of the various intermediate sections or segments C.

D represents a metallic strap, band, or wire, having its lower end riveted to section A at *d*, said rivet being preferably located above the bead *a*, so as to be concealed by the lower lap of the elbow, as represented in Fig. 3. This binder D is long enough to extend the whole distance of the extrados of the elbow, the other extremity of said binder being bent down and clinched tightly against the outer end of section B at *d'*. (See Figs. 1 and 4.) This clinch or bend *d'* unites the end sections A B and intermediate segments C securely together; but in order to afford a more positive method of locking the component members of the elbow to each other, I prefer crimping the binder D at suitable intervals in the following manner: At each lap of the sections C said strap is crimped at *d''*, which crimps are concealed by the overlapping section, as more clearly shown in Diagram 7. Instead, however, of crimping this binder at every joint of the elbow, such locking-bends may be formed at any convenient intervals.

The intrados of my elbow may be furnished with a similar binder, E, riveted to the lower section at *e*, clinched to the upper section at *e'*, and crimped at suitable intervals *e''*. (See Figs. 3 and 4.)

The thimble which I prefer coupling to my elbow is constructed as follows: F is a sheet-metal or other light cylinder, having at one end an inwardly-projecting flange, *f*, and at the other end an outwardly-projecting flange, *f'*, although a series of pins or lugs may be substituted for these oppositely-projecting flanges.

This thimble is fitted in the chimney-pier, so as to bring the flange *f'* in contact with the plastered surface of said pier, and the end section B of the elbow or the terminal joint G of the stove-pipe is then inserted in said thimble, the collar H having been previously applied either to the member B or G.

Pipe G is then shoved in as far as flange *f* will permit, after which collar H is forced tightly against the plastered surface of the chimney-pier, as seen in Fig. 6. By referring to this illustration it will be seen that said collar conceals the flange *f'*, while the inner flange *f* limits the entrance of pipe B or G, and, therefore, there is no danger of said pipe being shoved in so far as to encroach upon the flue-space of the chimney.

In constructing my elbow the pipe ends A *a* B and intermediate sections C *c* are first bent into the proper shape, and each member of the elbow is then securely riveted, thus forming eight separate and distinct rings or segments, although the device may be composed of a greater or less number of individual parts, if desired. The two binders, D and E, are then riveted to the lower pipe end A, at *d* and *e* respectively, after which act the first of the intermediate sections C is shoved onto the diminished or upper end of said member A, and forced down upon the same as far as the bead *a* will permit. The binders D E are then crimped over the upper end of section C, as at *d''* and *e''*, and the second intermediate section C is fitted to the first one, and these acts are repeated until a sufficient number of segments have been united to impart a quarter bend to the elbow, terminating with the upper pipe end B.

The ends *d'* and *e'* are then clinched or bent over the outer edge of joint B, which act completes the manufacture of an elbow, and when thus securely united none of the various sections can be separated by any ordinary wear and tear.

As the clinches *d'* and *e'* are located at the diminished end of joint B, the contiguous section G of the stove-pipe is readily slipped over said retaining devices *d' e'*, thereby concealing them.

When a quarter bend is made in the elbow, as seen in Fig. 1, it is evident the pipe applied to joint B will be horizontal or at right angles to the pipe inserted in joint A; but if it should be desired to pitch the discharging end of the pipe up at any angle, it can be accomplished in a few minutes by observing the following instructions: The clinchers *d'* and *e'* are first straightened out and the pipe end B detached from the last one of the intermediate sections C, after which as many of the latter are removed as may be needed to insure the proper pitch of joint B when said joint is again applied to the elbow.

This end piece or joint B is then secured by clinching the free ends *d'* and *e'* of the binders, the projecting portions of said binders being either cut off or else allowed to enter the section G.

Such an inclined position of the section G of the stove-pipe is seen in Fig. 2.

From the above description it will be apparent that my elbow, although perfectly unyielding while the clinches *d' e'* perform their duty is nevertheless capable of being readily taken apart by any person after said clinches have been disengaged from section B, and on this account the device can be regulated to pitch the discharging end of the smoke-pipe at any desired angle, and without calling in the assistance of a tinner or other artisan.

The elbow will be secure enough for ordinary purposes if constructed with but a single binder, although the use of two such straps or bands is preferred.

As some stop must be employed to regulate the lap of the joints, I have preferably made use of the beads *a* and *c*; but the same results can be obtained by rolling a series of outwardly-projecting bosses or other protuberances in the various sections of the elbow.

As the leading feature of my invention consists of a sectional pipe-elbow whose compo-

nent members are united together with one or more internal binders, I reserve the right of modifying the details of construction, providing this leading feature is not departed from—as, for example, in some cases both ends of the bands D and E may be clinched to the end pieces A B, thus dispensing with the rivets *d* and *e*.

I reserve also the right of making the within-described thimble and adjustable collar the subject of a future application for patent. I am aware of the fact that internal binders have been employed with pipe-elbows whose angles are capable of being changed at will by the rotation of one or more of their constituent rings. Therefore my claim to the internal binder or binders is limited to use of such retaining devices with pipe-elbows whose angles are capable of being changed by the bodily detachment of one or more of the separable sections thereof, as herein described.

I claim as my invention—

1. A sheet-metal pipe-elbow consisting of two end pieces A *a* B and a series of readily-detachable intermediate sections, C *c*, which end pieces and sections are connected by means of slip-joints, and are united together with one or more internal binders, said binder or binders being locked to one or more of the slip-joints of the elbow, substantially as herein described, and for the purpose set forth.

2. A sheet-metal pipe-elbow consisting of two end pieces, A *a* B, and a series of intermediate detachable sections, C *c*, which end pieces and sections are united together by an internal binder, D, riveted to end piece A *a* at *d*, and clinched to end piece B at *d'*, substantially as herein described, and for the purpose set forth.

3. A sheet-metal pipe-elbow consisting of two end pieces, A *a* B, and a series of intermediate detachable sections, C *c*, which end pieces and sections are united together by an internal binder, D *d d'*, having crimps *d''*, located at one or more joints or laps of said elbow, substantially as herein described, and for the purpose set forth.

4. A sheet-metal pipe-elbow consisting of two end pieces, A *a* B, and a series of intermediate detachable sections, C *c*, which end pieces and sections are united together by one internal binder, D *d d' d''*, extending along the extrados of the curve, and another internal binder E *e e' e''*, extending along the intrados of said curve, substantially as herein described, and for the purpose set forth.

In testimony of which invention I hereunto set my hand.

WILLIAM BORRMAN.

Witnesses:

JAMES H. LAYMAN,

D. P. KENNEDY.