

(No Model.)

J. F. WEITZEL.
CONSTRUCTION OF SHEET METAL PIPES.

No. 592,459.

Patented Oct. 26, 1897.

Fig. 1.

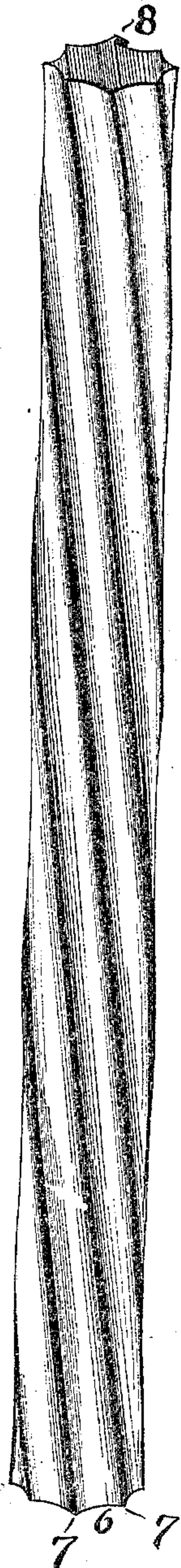


Fig. 2.

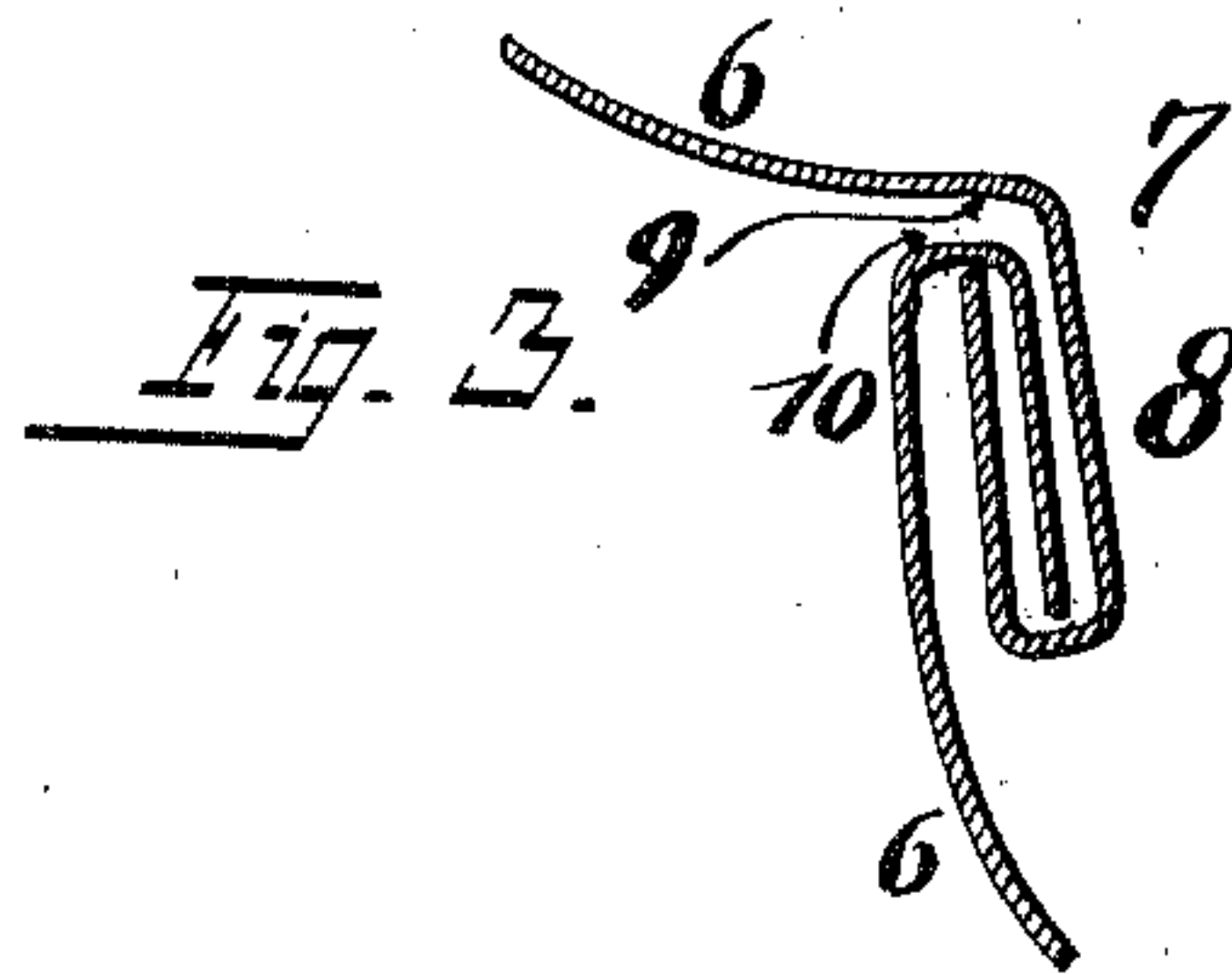
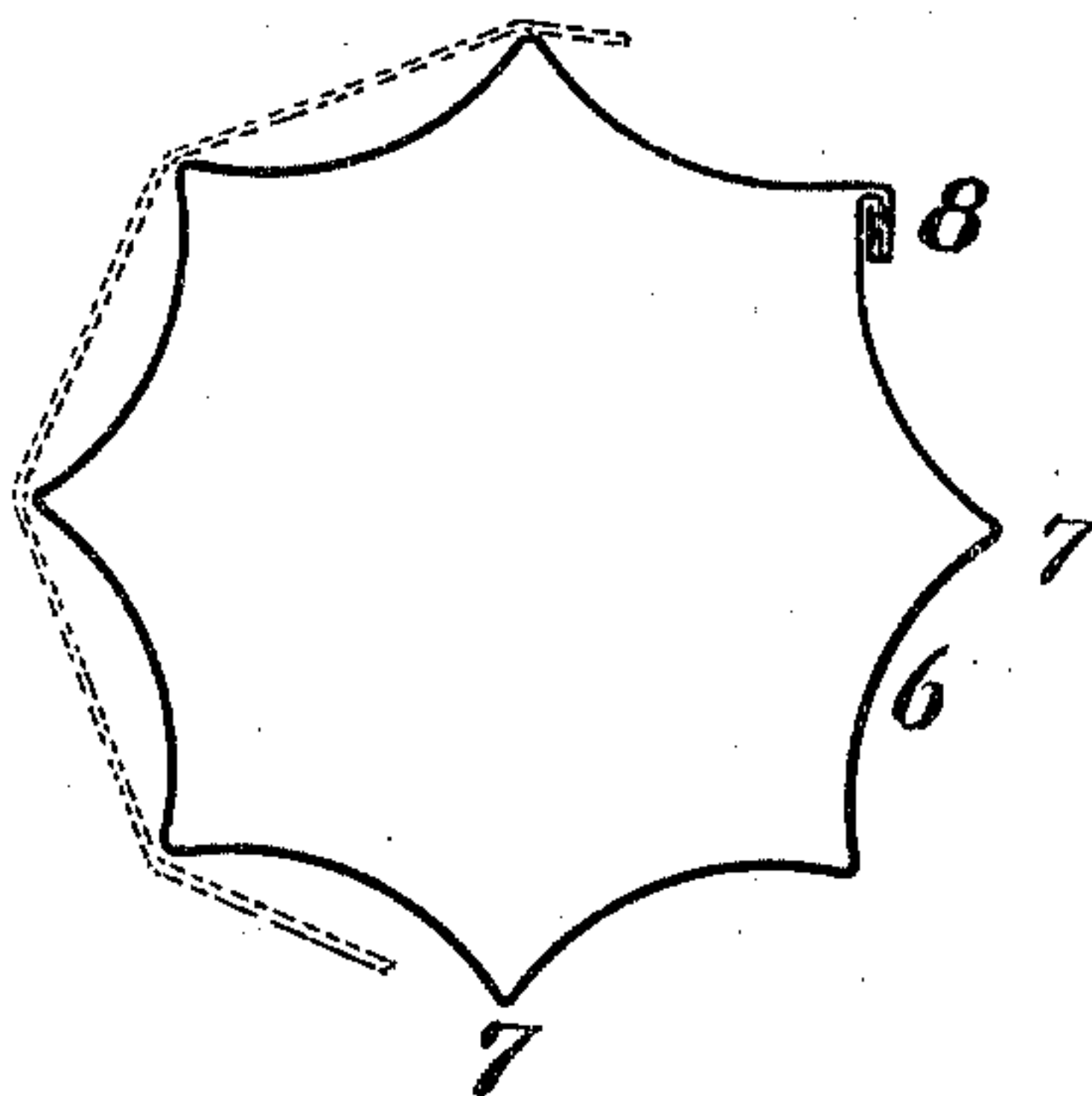
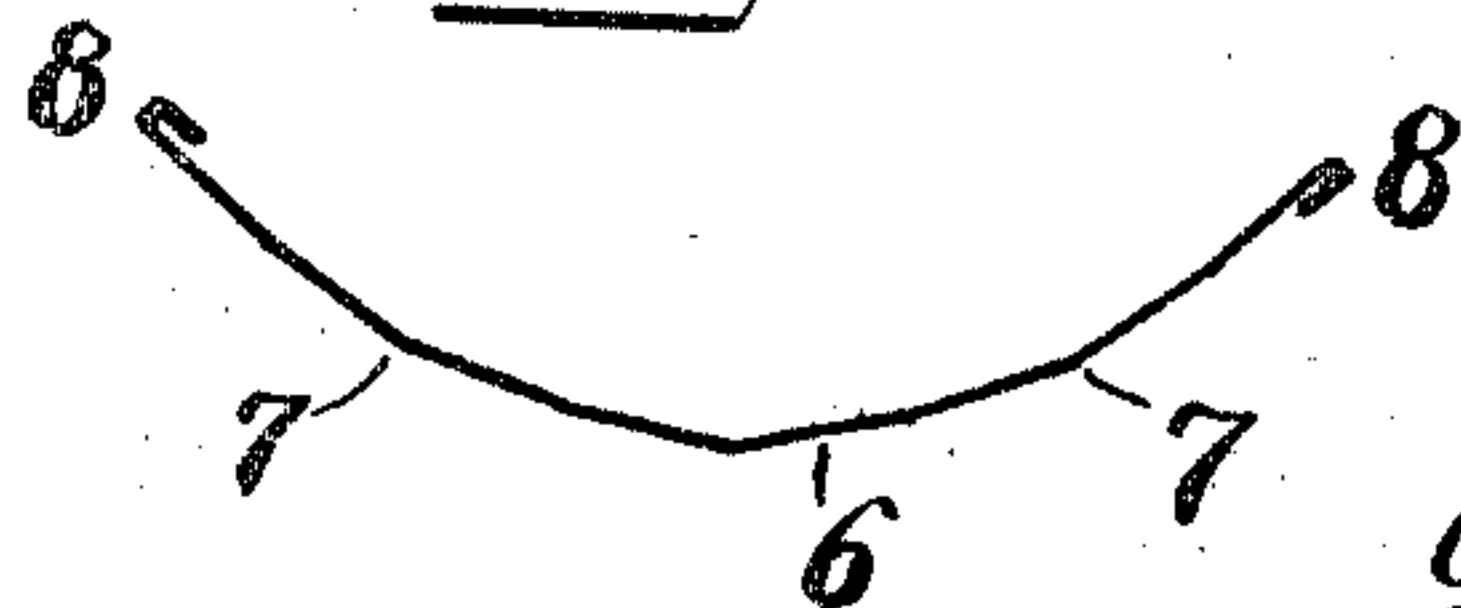


Fig. 3.

Fig. 4.



Attest.

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UNITED STATES PATENT OFFICE.

JACOB F. WEITZEL, OF LUDLOW, KENTUCKY.

CONSTRUCTION OF SHEET-METAL PIPES.

SPECIFICATION forming part of Letters Patent No. 592,459, dated October 26, 1897.

Application filed January 11, 1897. Serial No. 618,758. (No model.)

To all whom it may concern:

Be it known that I, JACOB F. WEITZEL, a citizen of the United States, and a resident of Ludlow, Kenton county, State of Kentucky, have invented certain new and useful Improvements in the Construction of Sheet-Metal Pipes; and I do declare the following to be a clear, full, 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, attention being called to the accompanying drawings, with the reference-numerals marked thereon, which form a part of this specification.

This invention relates to improvements in the construction of sheet-metal pipes for all purposes, such as pipes for conductors, down-spouts, exhaust-pipes, and for heating, ventilating, or dust-collecting systems. It relates particularly to improvements in the construction of pipes, as shown in my former patent, No. 525,061, issued August 28, 1894. In that patent the object was to strengthen a sheet-metal pipe by twisting the sides and corners of the same to a spiral shape. Since then practical manufacture has developed certain defects and imperfections during construction, and the improvements which have been devised to overcome these defects and imperfections form the subject of this invention. This latter is fully described in the following specification and pointed out in the claims at the end thereof, the construction being also illustrated in the accompanying drawings, in which—

Figure 1 shows in a perspective elevation a length of such pipe constructed in accordance with my improved construction. Fig. 2 is an enlarged end view of the same. Fig. 3 is a sectional detail view of the locking-seam, and Fig. 4 shows end of sheet before its edges are connected to form the pipe.

The profile or cross-section of this pipe should be such as to contain a number of sides and corners and is therefore polygonal. In the drawings an octagonal shape has been selected, of which 6 are the sides and 7 the corners, the latter formed where such sides join. The edges of the sheet which forms the pipe are connected by an ordinary lock-seam 8. Formerly the pipe-sections were then twisted

longitudinally, whereby the sides and corners assumed the spiral shape shown.

In the former patent the seam was located between two of the corners 7 7, which location seemed to be a very ill-chosen one, inasmuch as during the twisting operation the seam had a constant tendency to open. This tendency was caused by the fact that no provision had been made to take care of any surplus metal, such surplus arising from a narrowing which the sides would experience during the twisting of the pipe. This difficulty has been overcome by having the sides formed concave by running the pipes through suitable forming devices, and which form, by breaking the resistance of the straight sides, permitted them to continue to yield farther in the same direction during the twisting operation. The opening of the seam was thereby prevented, and I further improve and strengthen the latter by locating it at one of the corners, where by reason of the formation of such corner the metal has more stability and stiffness. The seam is further secured against opening by the concave sides, whereby an abutment is formed on the inside, as shown at 9 in Fig. 3, by one of the parts which come together when forming the seam and against which the extreme outer edge 10 of this other part bears, and the interacting contact of which two parts at this point prevents them from slipping away from each other. This curved form of the sides has, however, other important advantages which make its application highly desirable. It affords the pipe a possibility to expand to prevent it from bursting where such may occur—as, for instance, when such pipes are used to carry water, as is the case in down-spouts, which are liable to freeze up in winter.

Another result produced by this construction is the artistic effect due to the contrast of light and shadow between the projecting edges 7 and the hollow sides 6 between them. This is of no mean importance where such pipes are used on buildings, particularly on the outside thereof, as water-conductors and down-spouts, for instance, when they, instead of interfering with the architectural appearance of the building, aid and improve the same by their artistic effect.

In the practical manufacture of these pipes, straight sections only being contemplated, a sheet of the required size is first bent or angled by being passed through a break, forming it as shown in Fig. 4, to determine the size—that is, width of the sides 6—and the location of the corners. The two parts of the seam are also formed by crimping the edges of the sheet, after which they are brought together, forming a pipe of a profile as indicated in dotted lines in Fig. 2. The pipe is then passed lengthwise through suitable forming devices, whereby the inwardly-curved form of the sides is obtained and the seam closed and compressed. According to the degree of concavity, it may be necessary to repeat this operation until the desired depth is obtained. After this the pipe is twisted to obtain the spiral shape of the sides and corners, which is done by rotating more or less the ends of a section in opposite directions. This twisting operation decreases slightly the width of sides 6, giving corners 7 a tendency to approach each other, which, until overcome, resists such twisting operation and makes it accordingly more difficult. By having sides 6, however, concave they are rendered less stiff than if straight, whereby the resistance to this tendency is lessened and the twisting operation made more easy. Without these concave sides it is practically impossible to properly construct a pipe with twisted sides, as I have shown. I am aware of pipes having spiral corrugations produced by pressure and stamping, the sides of pipe and seam being straight. In my case the spiral shape is produced by twisting the otherwise complete pipe, whereby all parts of the latter—that is, sides, corners, and seam—participate in the twisting operation and assume a shape accordingly.

Having described my invention, I claim as new—

1. As a new article of manufacture, a straight-sheet-metal pipe-section of polygonal profile, having all its parts, that is corners 7 and sides 6 between them twisted to a spiral shape and the sides 6 concaved between the projecting corners 7, the whole being constructed of one sheet of metal which contains all the sides and the edges of which are connected by a lock-seam 8, such edges being coincident with the edges of the sides 6, so that when they are joined, the completed seam forms one of the corners 7 and is also spirally twisted.

2. A straight section of sheet-metal pipe having a polygonal profile, and its corners 7 and sides 6 between them twisted to a spiral shape, the whole being constructed of one sheet of metal which contains all the sides and the edges of which are crimped to form the component parts of a lock-seam by which they are connected to form the pipe, such edges being coincident with the edges of the sides 6, so that when they are joined the completed seam 8 forms one of the corners 7 and is also spirally twisted, the sides 6 between the corners being concaved, whereby angles are produced of which the one at the seam forms an internal abutment 9 as to one of the component parts of the seam which interlock here and against which abutment 9 the extreme outer edge 10 of the other connecting part rests, whereby the joining parts of the seam are prevented from slipping apart.

In testimony whereof I hereunto affix my signature in presence of two witnesses.

JACOB F. WEITZEL.

Witnesses:

C. SPENGEL,
ARTHUR KLINE.