

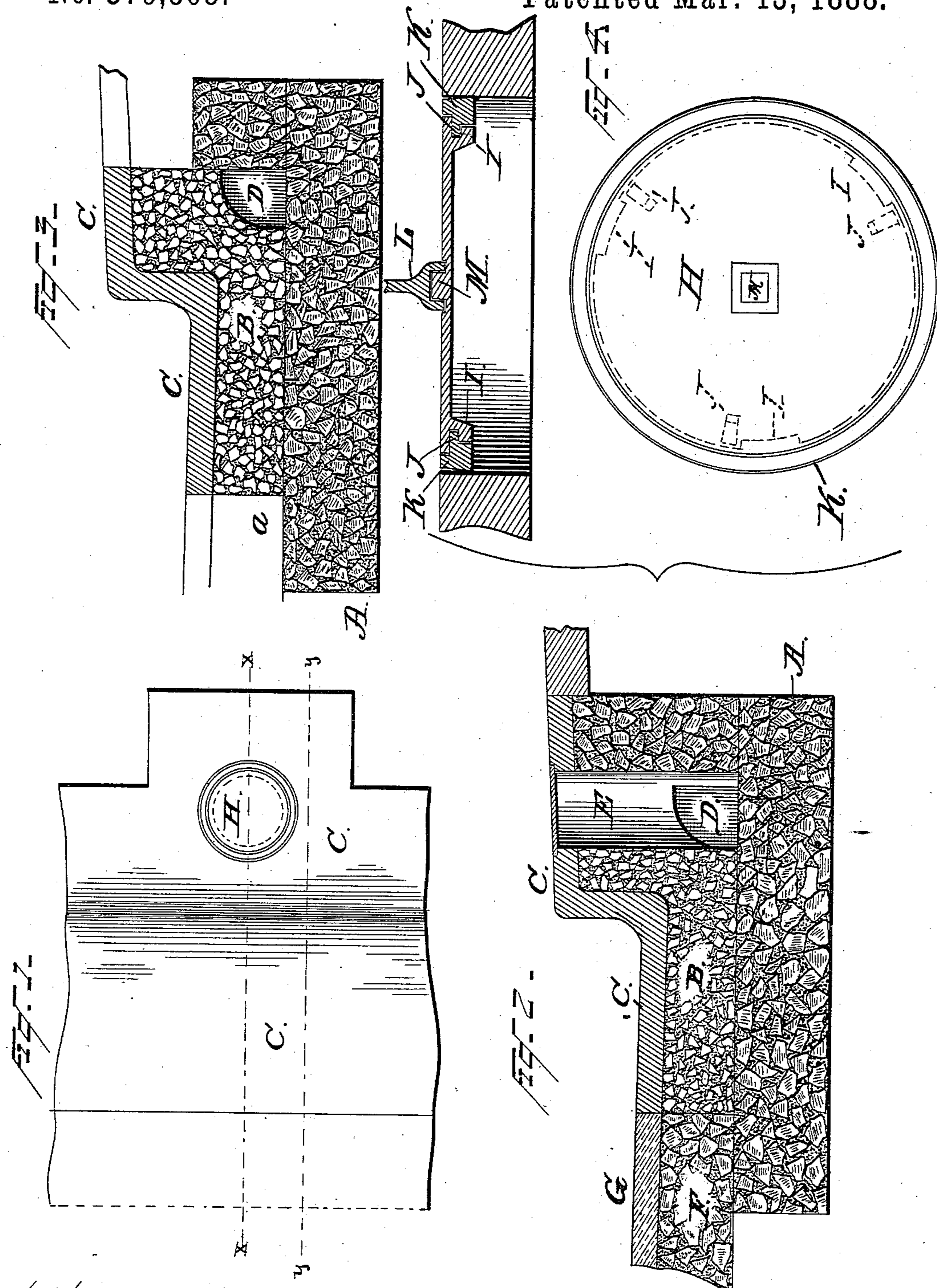
(No Model.)

2 Sheets—Sheet 1.

H. L. CRANFORD.  
COMBINED GUTTER AND CONDUIT.

No. 379,505.

Patented Mar. 13, 1888.



WITNESSES.

Norris A. Clark.

E. Everett Ellis

INVENTOR.

Henry L. Cranford.

By atty J. M. Crutcher

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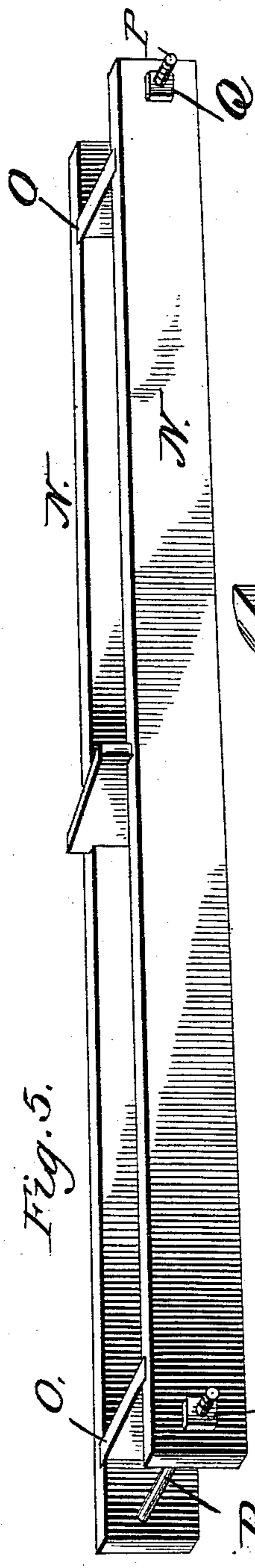


Fig. 5.

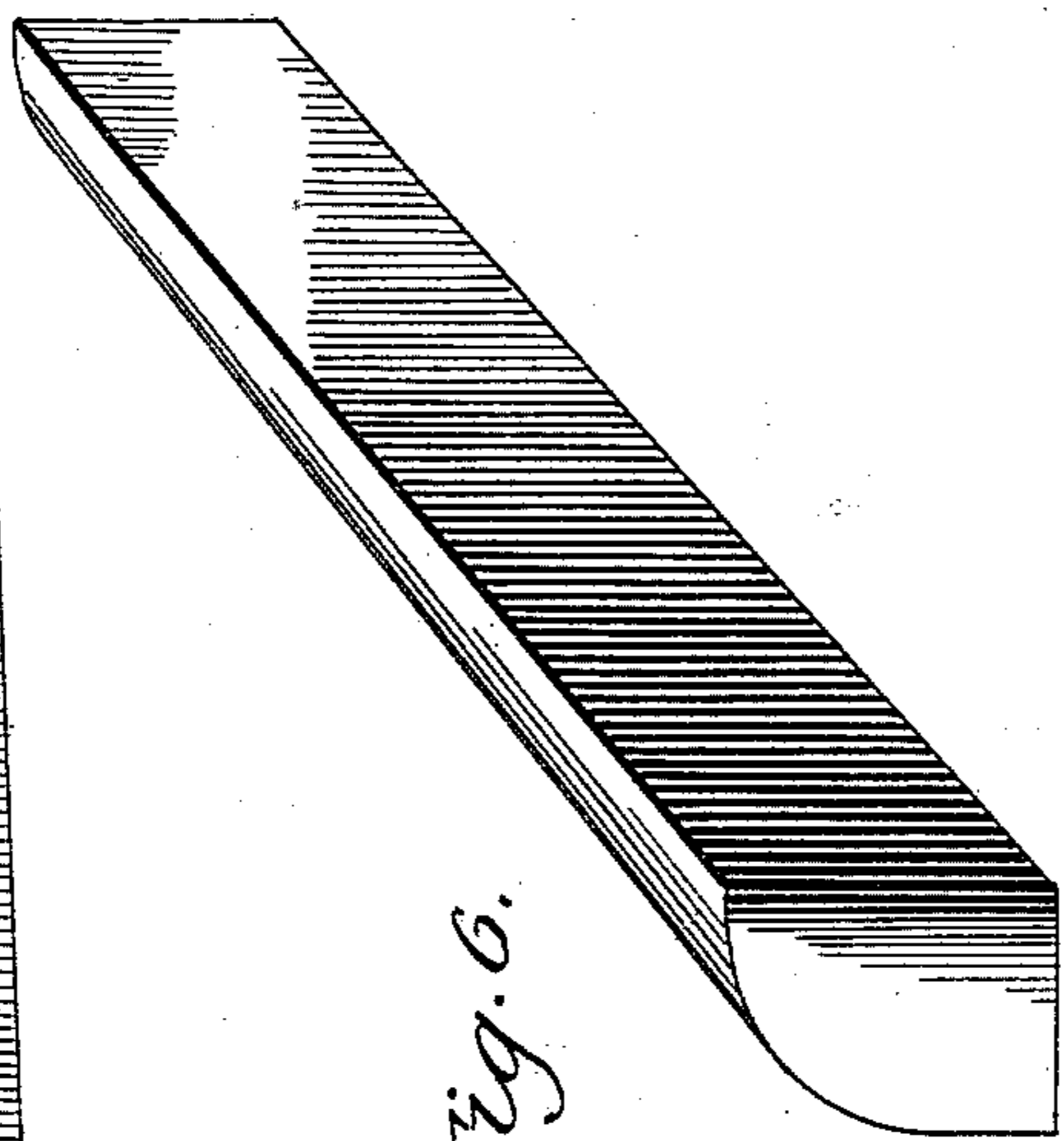


Fig. 6.

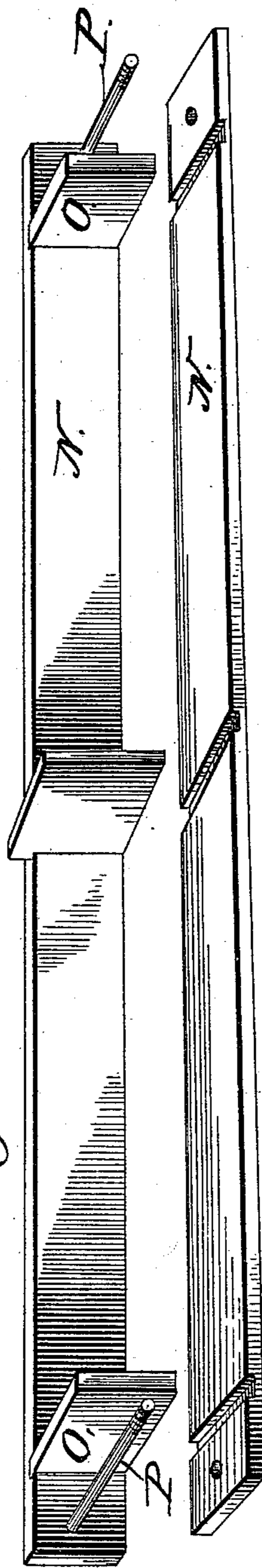


Fig. 7.

WITNESSES.

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Henry L. Cranford.  
By atty, Jm. C. S. Intire

# UNITED STATES PATENT OFFICE.

HENRY L. CRANFORD, OF WASHINGTON, DISTRICT OF COLUMBIA.

## COMBINED GUTTER AND CONDUIT.

SPECIFICATION forming part of Letters Patent No. 379,505, dated March 13, 1888.

Application filed July 22, 1887. Serial No. 244,988. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY L. CRANFORD, a citizen of the United States, residing at Washington, in the District of Columbia, have  
5 invented new and useful Improvements in a Combined Gutter and Conduit and Method of Laying Same, of which the following is a specification.

My invention relates to certain new and  
10 useful improvements in the construction of composite curb and gutter for streets.

In the construction of the ordinary composite pavement the curb is composed of ordinary granite or other stone cut in suitable or  
15 convenient lengths, and after being placed properly in line the composite pavement is made upon the road-bed and joined with the curb either directly or to a block-stone gutter arranged next to the curb.

20 From experience with this class of pavements and curbs I have found that the joints between the sections of curb frequently become distorted by the irregular settling of the sections, and thus produce projections which act  
25 as dams to catch debris and seriously retard the flow of water to the sewers. I have also found that it being almost impossible to make or retain a close joint between the gutter and curb or between the pavement and gutter, the  
30 surface-water gravitates below the surface of the street and in many instances tends to rot or disintegrate the pavement.

The object of my invention is to guard against the disadvantages named and to provide a continuous curb and gutter in connection with a composite pavement, which shall  
35 at the same time present a neat and uniform appearance and be substantial and durable. And my invention further has for its object  
40 to provide a safe and reliable conduit for electrical wires—such as telephone and telegraph—which shall at the same time be readily accessible for repairs, &c.; and with these ends in view my invention consists of a combined curb and  
45 gutter having the peculiarities of construction best understood from the detailed description, and specific claims hereinafter set forth.

In the accompanying drawings, Figure 1 is a plan view of a portion of sidewalk, gutter,  
50 curb, and street-pavement. Fig. 2 is a cross-section taken at the line *x x* of Fig. 1. Fig. 3

is a similar section taken at the line *yy* of Fig. 1, and Fig. 4 is a plan and cross-section showing the cover for man-hole and means for securing the same in position, and on Sheet 2  
55 Figs. 5, 6, and 7 illustrate the molds employed for forming my improved curb and gutter.

In the several figures illustrating the pavements and curb and gutter, A represents a concrete foundation upon which the curb and  
60 gutter are expected to rest. This foundation is composed of the same materials and is laid in the same manner as usually prescribed for concrete foundations for asphalt pavements, and is extended laterally toward the center of  
65 the street a short distance beyond the outside line of the gutter, forming a step, as most clearly shown at *a*, Fig. 3, in order that the street-pavement when laid shall overlap the curb-foundation, as clearly shown at Fig. 2. 70

The curb and gutter are made of body or sub-stratum B, and are composed of one part cement, two parts sharp sand, and three parts clean broken stone, preferably not more than  
75 one inch in their largest dimensions, upon which is laid an exposed surface, C, one and a half inch thick, consisting of three parts granulated granite, (the fragments being of such size as to pass through a quarter-inch  
80 screen,) free from all dust, and two parts of cement. The upper surface of the curb is flat, with sufficient inclination to turn water, and its point of juncture with the vertical line is beveled or rounded, as clearly shown, and  
85 the point of juncture between the curb and gutter portions is formed with a reverse curve, the object of the latter being to throw the wheels of vehicles away from the side of the curb when traveling parallel with said curb.

The curb and gutter, composed of the materials named, are preferably formed on the  
90 ground in shifting or sliding molds, such as illustrated on Sheet 2 of the drawings, and during the process of forming a quadrant or other suitably-shaped core is employed to produce a longitudinal channel, D, at the inside  
95 lower portion of the curb, which is designed to form a conduit for electric wires. This core is drawn and advanced as the curb and gutter are built or molded, and at suitable distances  
100 vertical man-holes E are formed (by the employment of a suitable core) to intersect and

communicate with the wire conduit or channel D.

F G represent the street-pavement, F being the foundation and G the top surface, arranged  
5 and formed upon the projection or step of the curb and gutter foundation.

The man-holes E are preferably closed with cast-iron caps or covers H, provided with two or more lips, I, adapted to engage a similar  
10 number of lugs, J, projecting from a ring, K, secured in any suitable manner to the curb, a key, L, grasping a short stem, M, being employed for turning the cover to lock the same in position or release it.

15 I have found it desirable to make my improved curb and gutter in sections of about eight feet in length to permit the usual expansion and contraction; but to facilitate the manufacture I employ molds of about sixteen feet in  
20 length, with a vertically-removable plate or partition, about one-eighth of an inch in thickness, arranged at the center of the mold. The gutter portion of my combined curb and gutter may be made without the use of any mold other  
25 than a guard-board at the outside edge, and the curb portion alone formed within a mold, such as shown, arranged upon the top of the gutter portion while the latter is in condition to concrete and cement with the molded portion.  
30

It will be observed that the concrete foundation of the curb and gutter extends upward behind the channel D sufficiently high to completely inclose the same.

35 The mold employed, and as shown at Sheet 2 of the drawings, consists of two side pieces, N N, and two end pieces, O O, secured, in proper relation to form a box, by screw-bolts P and nuts Q, so that as each section of curb

is completed the removal of the bolts will enable the mold to be taken apart and again re-constructed at the point where it is designed to continue the formation of the curb and gutter. 40

While my improved curb and gutter are designed to be used in connection with concrete street-pavements, it will of course be understood that they may be employed to advantage with other well-known forms of pavements, and I do not therefore wish to be confined in  
50 this respect.

What I claim as new, and desire to secure by Letters Patent, is—

1. A combined curb and gutter composed of a concrete body of cement, clean sharp sand, and broken stone surfaced or covered with a stratum of cement and granulated granite in about the proportions set forth, and having a conduit or channel, D, and man-hole E, substantially as and for the purposes set forth. 55 60

2. A combined curb and gutter composed of a concrete body of cement, clean sharp sand, and broken stone B, surfaced or covered with a stratum of cement and granulated granite C, said curb and gutter having conduit D and man-holes E, the whole supported upon a concrete foundation, A, one end of which extends upwardly, as shown, to form the boundary of the conduit D, substantially as hereinbefore set forth. 65 70

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

HENRY L. CRANFORD.

Witnesses:

E. EVERETT ELLIS,  
M. A. BALLINGER.