

P. JOCHUM & T. EHRHARDT.

APPARATUS FOR MANUFACTURING ARTIFICIAL STONE.

No. 387,721.

Patented Aug. 14, 1888.

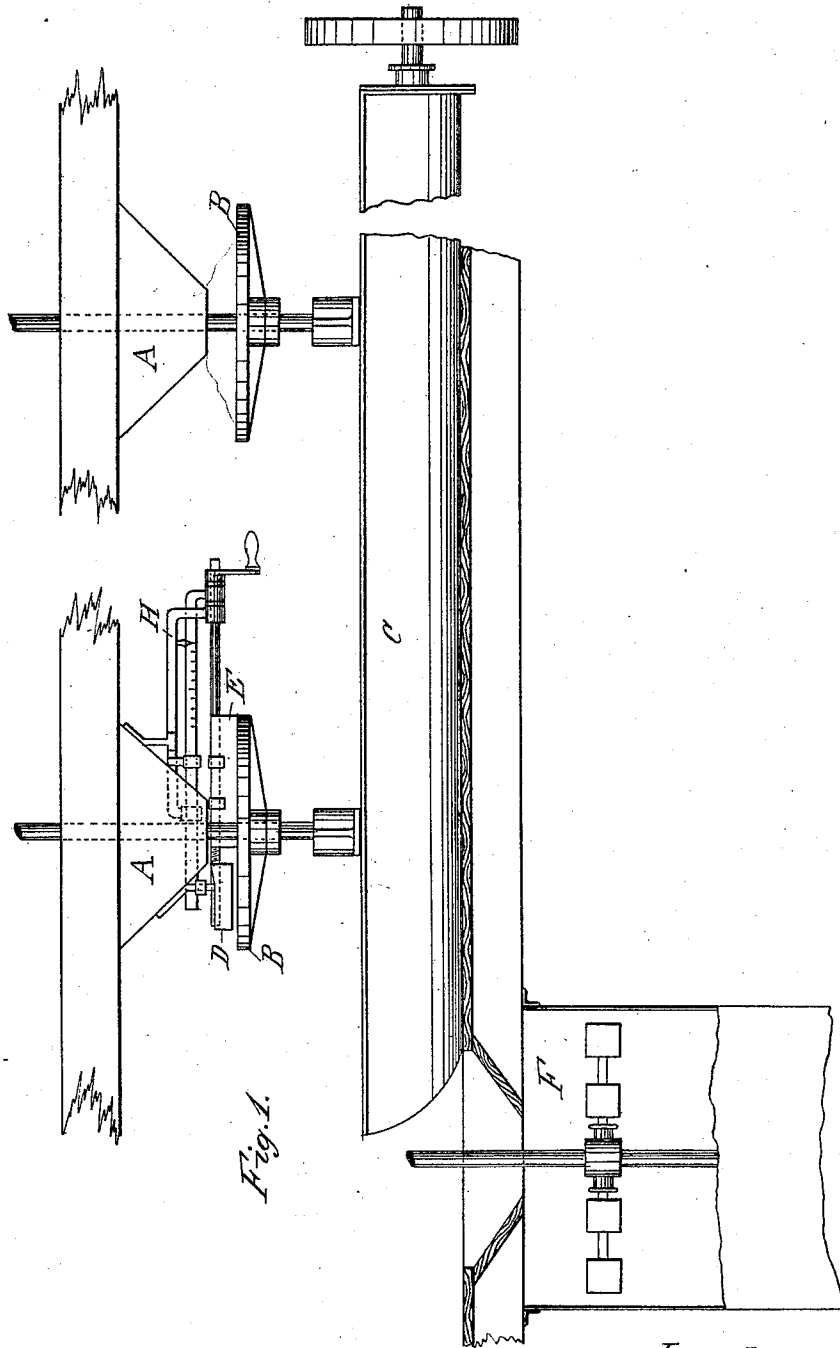


Fig. 1.

Witnesses:
 William D. Conner.
 David S. Williams.

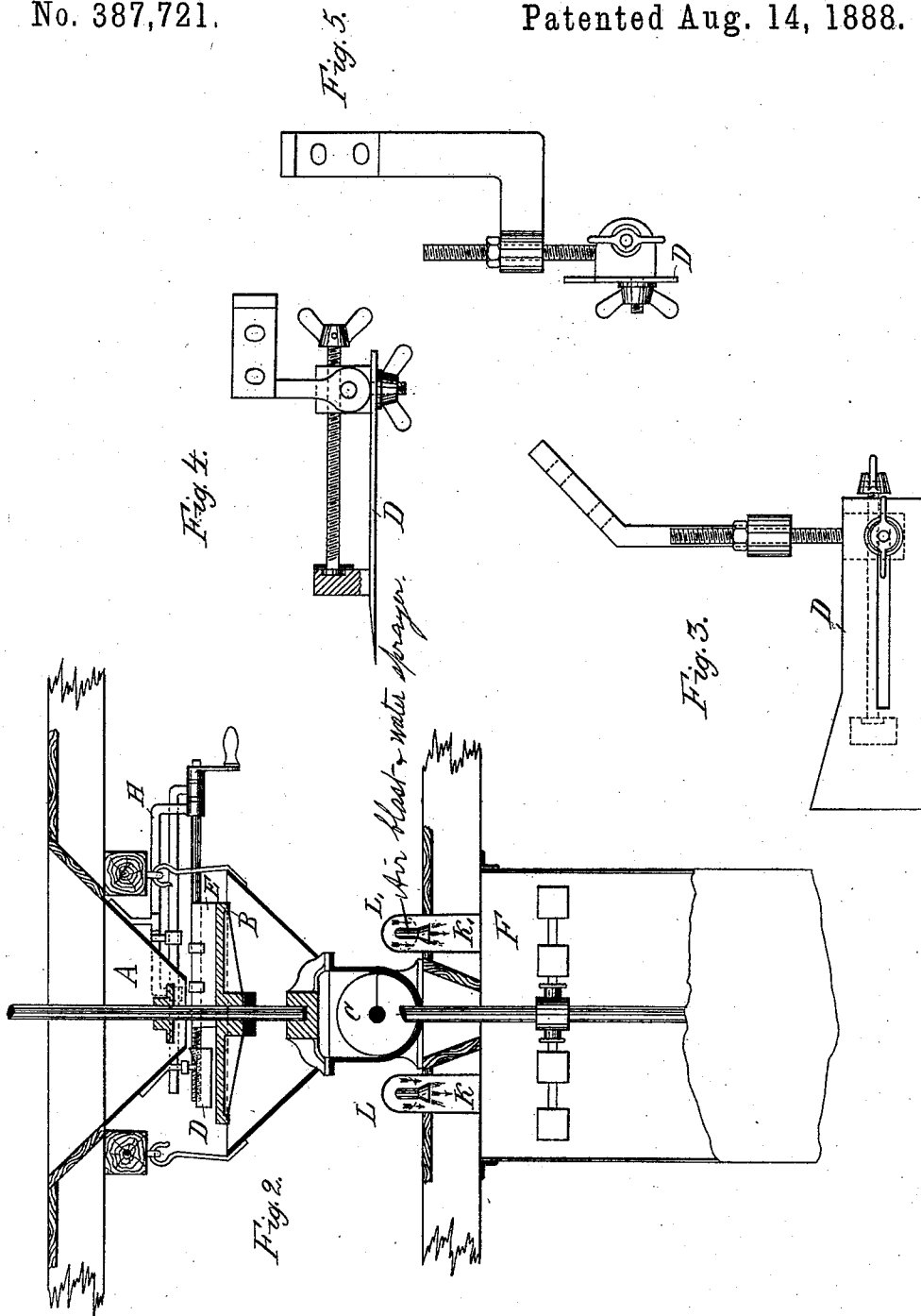
Inventors:
 Paul Jochum &
 Theodor Ehrhardt.
 by their Attorneys.
 Howson & Sons.

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Fig. 6.

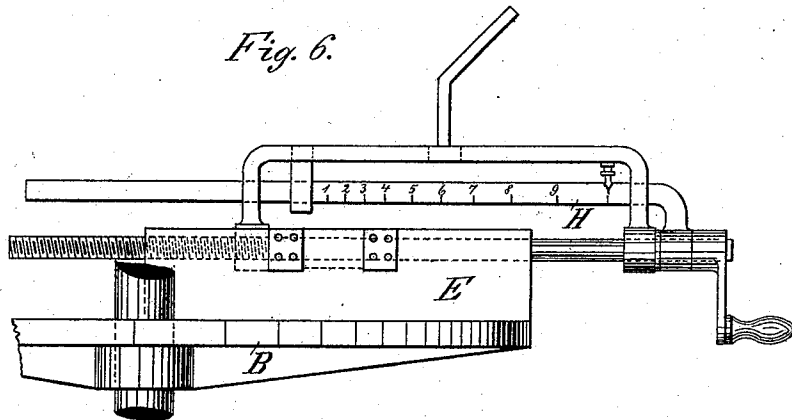
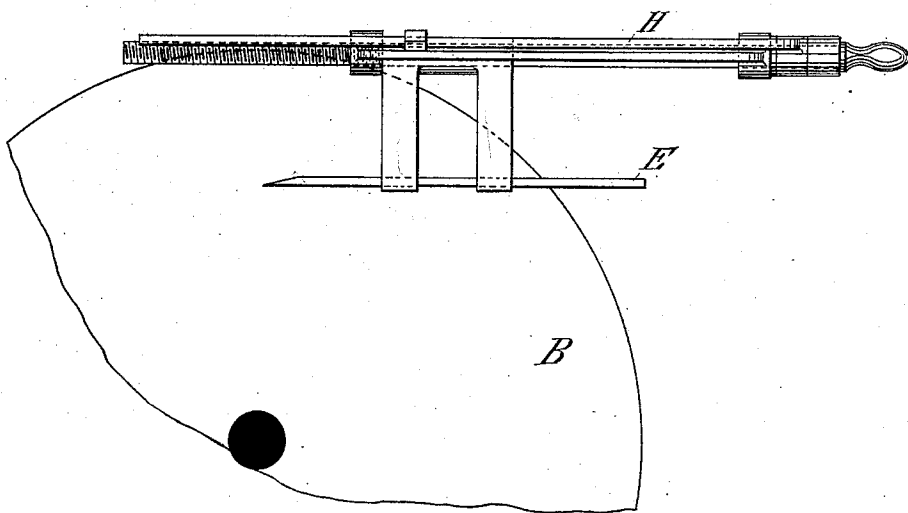


Fig. 7.



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(No Model.)

4 Sheets—Sheet 4.

P. JOCHUM & T. EHRHARDT.

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Fig. 8.

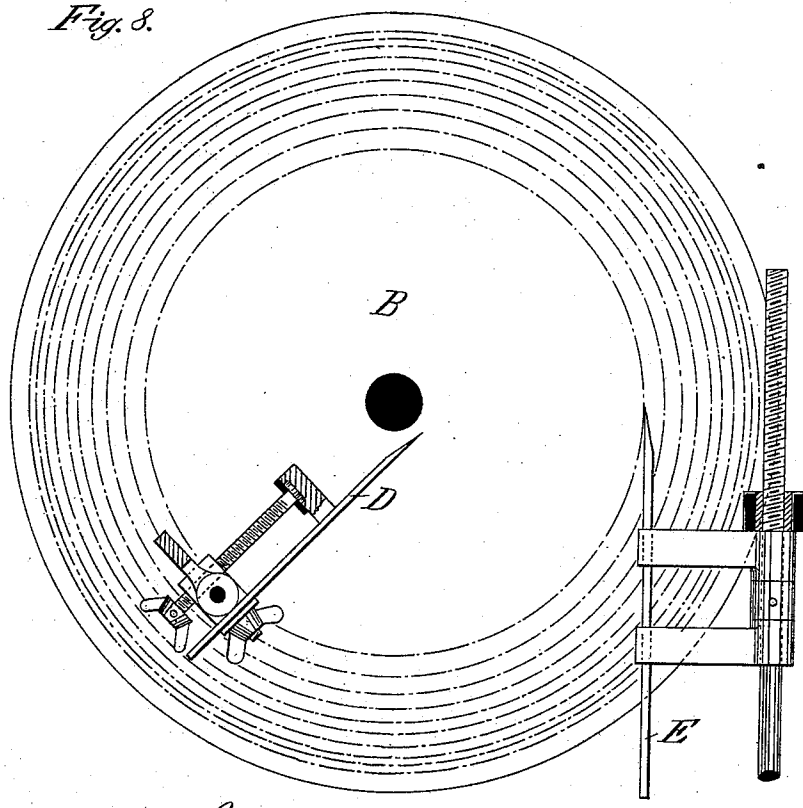


Fig. 9.

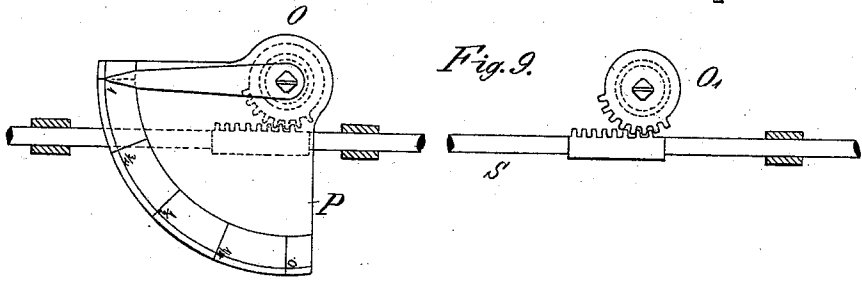
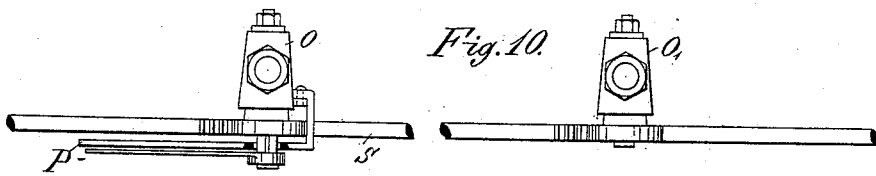


Fig. 10.



Witnesses:
 William D. Conner,
 David S. Williams.

Inventors,
 Paul Jochum &
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UNITED STATES PATENT OFFICE.

PAUL JOCHUM AND THEODOR EHRHARDT, OF OTTWEILER, PRUSSIA,
GERMANY.

APPARATUS FOR MANUFACTURING ARTIFICIAL STONE.

SPECIFICATION forming part of Letters Patent No. 387,721, dated August 14, 1898.

Application filed May 13, 1887. Serial No. 238,100. (No model.) Patented in Germany November 12, 1886, No. 40,546; in England February 18, 1887, No. 2,573; in France February 28, 1887, No. 181,850, and in Belgium February 28, 1887, No. 76,523.

To all whom it may concern:

Be it known that we, PAUL JOCHUM, doctor of philosophy, a subject of the King of Prussia, and THEODOR EHRHARDT, a subject of the King of Bavaria, residing both at Ottweiler, in the Kingdom of Prussia, Germany, have invented new and useful Improvements in the Manufacture of Artificial Stone, (for which we have obtained German patent, No. 40,546, dated November 12, 1886; British patent, No. 2,573, dated February 18, 1887; French patent, No. 181,850, dated February 28, 1887, and Belgian patent, No. 76,523, dated February 28, 1887,) of which the following is a specification.

Two or more clays of different degrees of fatness and of great binding power are ground fine by edge runners and are mixed in proportions that depend upon the quantity of clay in the particular strata employed, the proportions being so regulated as to produce a uniform degree of shrinkage of the mass during manufacture. Both clays must have as large a percentage of iron oxide as possible. The dry mixture of the clays, which, generally speaking, should be in the proportions of from 1:2 to 1:3, is passed through a mixing or pug-mill and is moistened with an emulsion, composed, as will be presently described, until a plastic mass is produced. The emulsion employed is composed of a saturated solution of sulphate of iron or other metallic sulphate, to which is added finely-ground iron ore, as rich in iron as possible, using by preference *caput mortuum* in the proportion of about one-twentieth of the weight of the sulphate employed, the two ingredients being thoroughly incorporated by stirring. The solution should not exceed 38° Baumé.

The clay compound prepared as above described is cut up into blocks of a leather-like consistency, which are then subjected to pressure, after which they are dried and are then first burned for forty-eight hours in a furnace giving an oxidizing-flame, and then for twenty-four hours in a furnace giving a reducing-flame. When cold the blocks produced have the appearance, hardness, and sound of cast-iron, and are practically indestructible, and they are

more particularly applicable with advantage for road-paving and other paving of all kinds.

For carrying out the above-described manufacture, apparatus is by preference employed which we will proceed to describe with reference to the accompanying drawings, in which—

Figure 1 shows a sectional elevation of the mixing apparatus; Fig. 2, a cross-section. Figs. 3, 4, and 5, enlarged details of the spreading apparatus D; Figs. 6 and 7, details of the discharging-scraper E; Fig. 8, a plan of the discharging-disk B and blades D E; and Figs. 9 and 10, plan and elevation of the regulating-cocks for the spraying apparatus.

The mixing apparatus consists of a number of charging-hoppers, A A, Figs. 1 and 2, below which are revolving discharging-disks B B. Each description of material employed is charged into a separate hopper, so that there are as many of these as there are separate ingredients. The finely-pulverized material falling from the hopper A onto the discharging-disk B forms thereon a conical heap having its apex in the axes of the disk, and having an inclination varying with the nature of the material. From these cones the different materials are discharged into a trough, C, by means of stationary adjustable scrapers, and from this trough they are conveyed in a more or less mixed condition by a revolving worm or conveyer into the mixing or pugging apparatus F, where they are thoroughly incorporated by means of revolving blades.

The arrangement of the scrapers for the above purpose is of special importance and constitutes the most essential feature of the apparatus.

In discharging apparatus heretofore employed ordinary scrapers were made to scrape away the material from the lower parts of the conic surface only, and in consequence of the varying form of such cone, as above stated, it was not possible to discharge from the different disks quantities having the required ratios to each other, and consequently no uniformly-constituted mixture of the ingredients was obtained. In order to obviate this disadvantage we employ the following arrangement.

Each disk B has two scrapers or blades—

namely, the actual discharging-scraper E and the preparatory blade D. The lower edge of D, which is provided with an adjusting contrivance, so that it may be arranged at a determined height above the disk, is situated a small adjustable distance above the surface of the disk, and it has for its object to spread the outer part of the cone into an even layer of uniform thickness on the disk, the scraper E being then made to act upon and remove a definite part of this layer only, such quantity being accurately regulated by adjusting the scraper E toward or away from the center of the disk, for which purpose there is provided an adjusting-screw carrying a scale, H, having divisions that correspond to definite quantities of material contained in concentric rings on the disk, as shown more clearly in Figs. 6, 7, and 8. With this arrangement it is possible to discharge either equal quantities from all the disks or to make the quantity discharged from one disk have any definite proportion to that discharged from the other or others.

In order to impart the requisite degree of moisture to the materials mixed in the desired proportions, the pugging or mixing apparatus F is provided with two nozzles, K K, having an annular orifice at their circumference only, and situated in the mouths of pipes L L', through which an air-blast is made to issue, such blast being caused to convert the issuing liquid into spray that is deposited among the entering pulverulent material. Cocks O O are provided, as shown in Figs. 9 and 10, for regulating the quantity of liquid delivered through the nozzles K K', such cocks being simultaneously actuated by means of a rod, S, having

rack-teeth gearing with teeth on the plugs of the cocks. On the one cock is fixed a quadrant-scale, P, the plug being provided with a pointer, so that by turning this into any desired position the quantity of the emulsion delivered may be accurately regulated.

Having now particularly described and ascertained the nature of this invention and in what manner the same is to be performed, we declare that what we claim is—

1. The herein-described apparatus for the manufacture of artificial stone, said apparatus comprising a series of feed-hoppers, and rotary discharging-disks below the hoppers, in combination with a preparing-blade, D, over the disk, an adjustable scraper, E, and a mixer into which the materials are fed, substantially as set forth.

2. The herein-described apparatus for the manufacture of artificial stone, said apparatus comprising a mixing or pugging apparatus and a feeding-trough, in combination with air-blast pipes, and valved water-spraying nozzles over the mixing apparatus, substantially as set forth.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

PAUL JOCHUM.
T. EHRHARDT.

Witnesses as to Paul Jochum:

GUSTAV HÜLSMANN,
B. ROL.

Witnesses as to T. Ehrhardt:

RUD. WYRLER,
J. SCOTT.