(No Model.) 3 Sheets—Sheet 1.

# H. S. ALBRECHT.

## PULVERIZER.

No. 604,283. Patented May 17, 1898.

Fig. I.

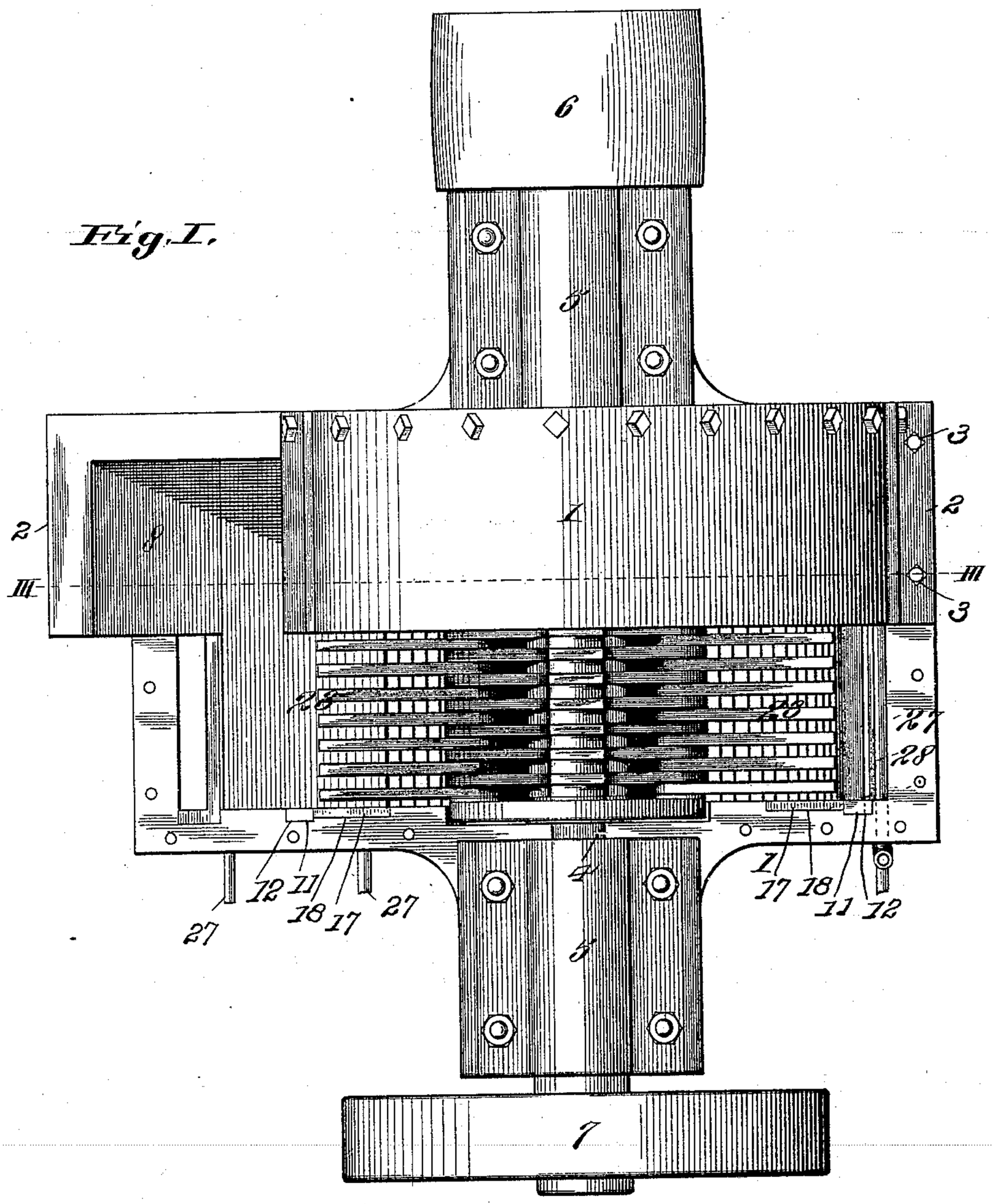
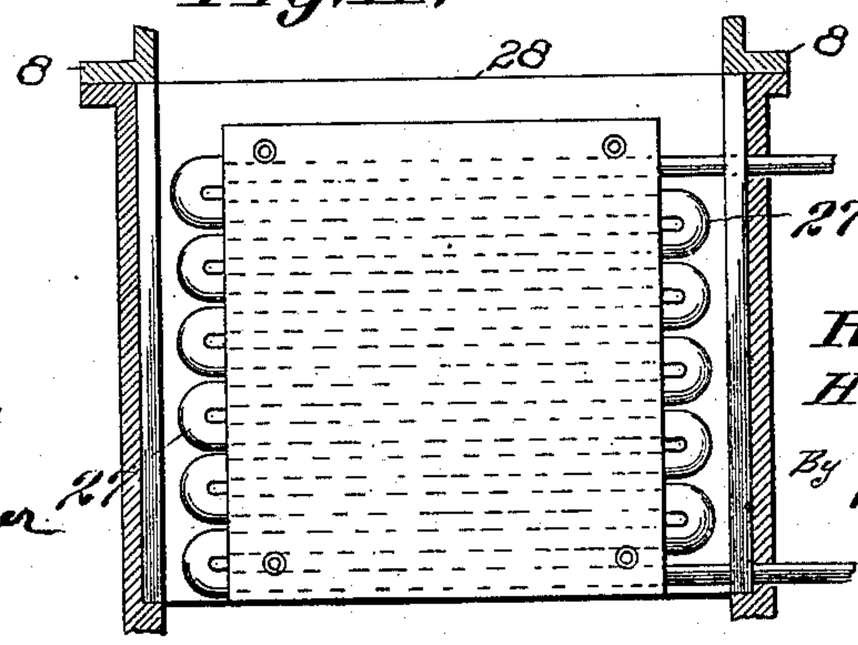



Fig. II.




Attest:
E. C. Knight
Stanley Stoner

Inventor:
H. S. Albrecht
By Knight Bros
Atty's

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# H. S. ALBRECHT.

## PULVERIZER.

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Fig. III.

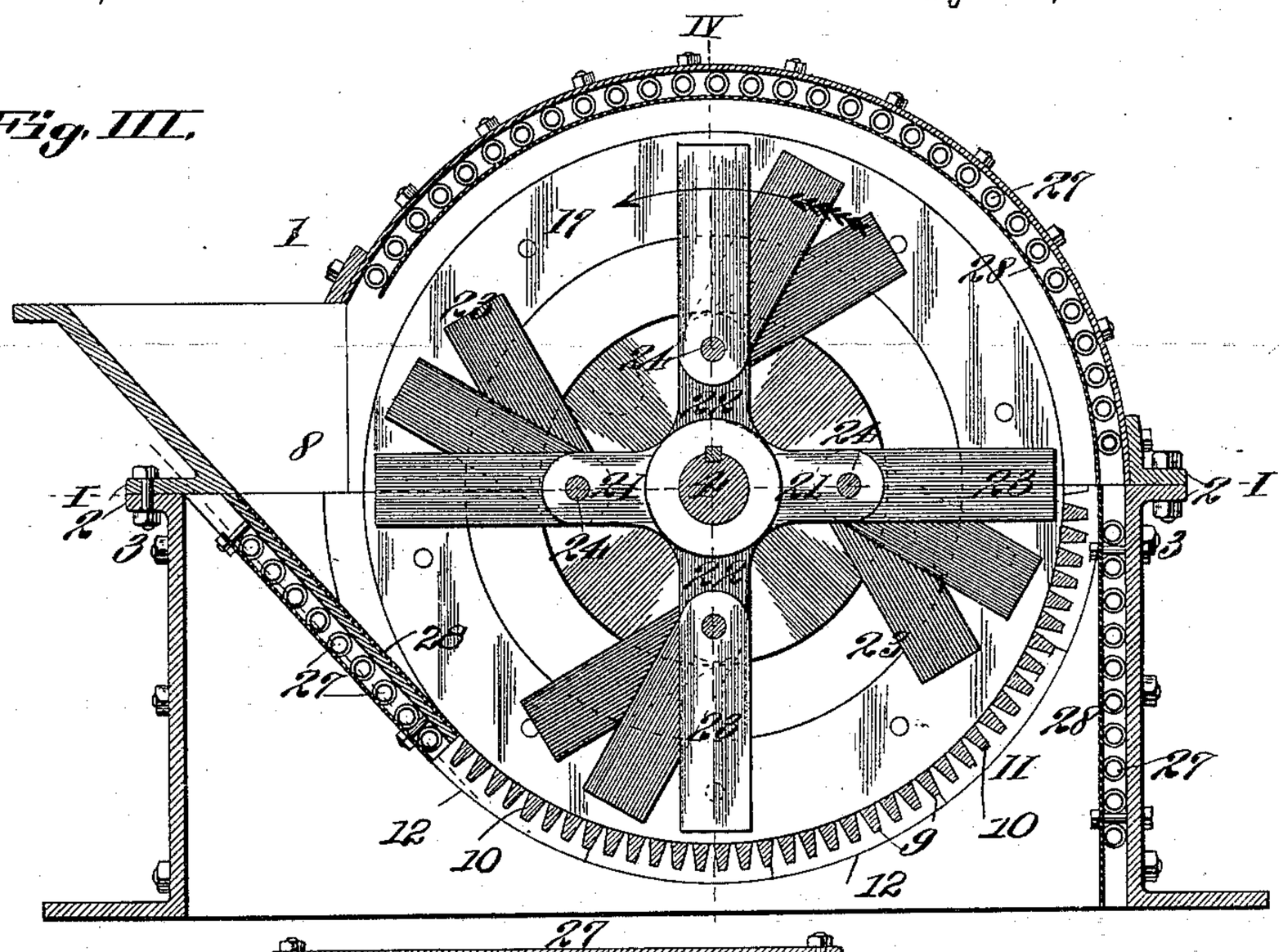



Fig. IV.

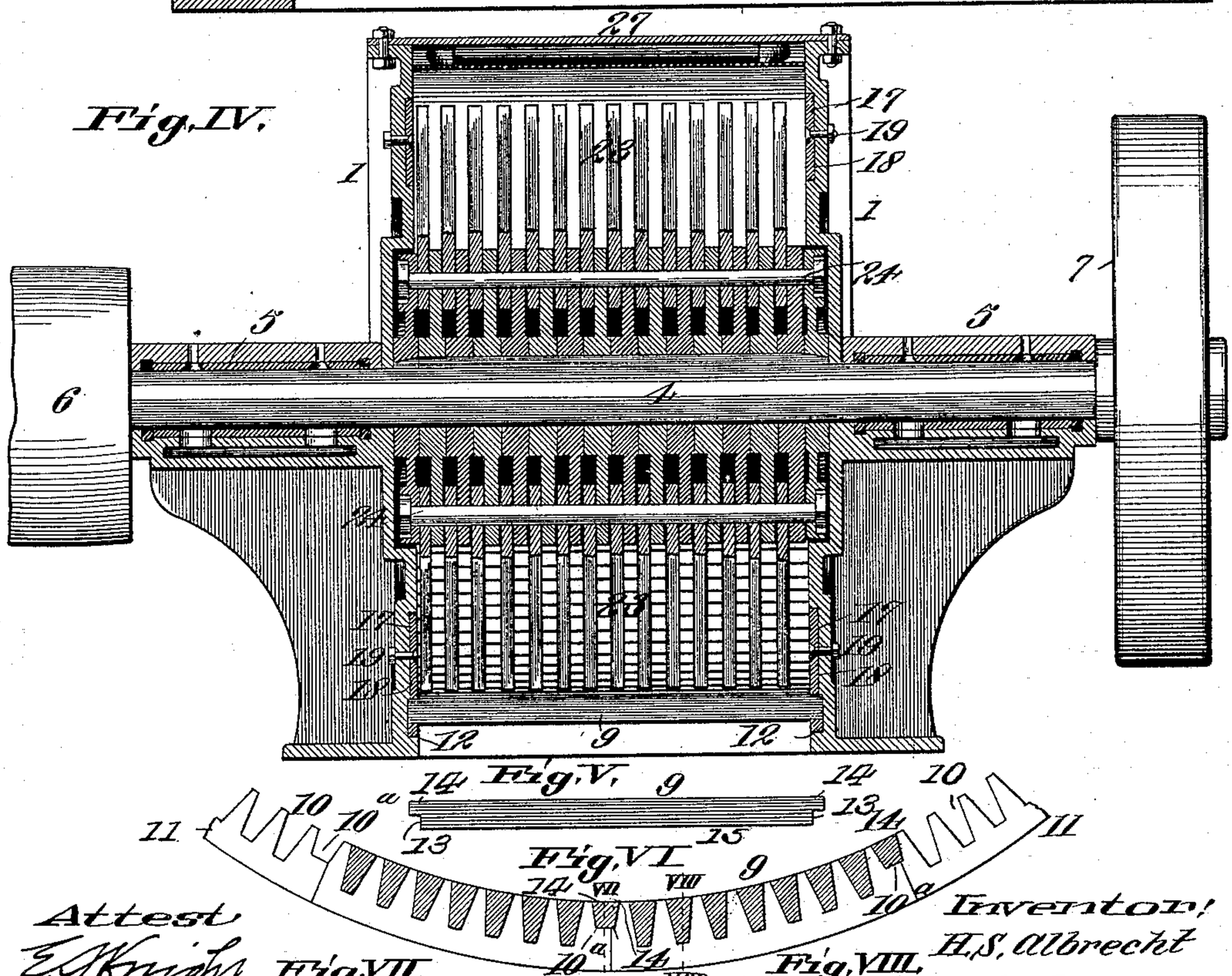



Fig. V.



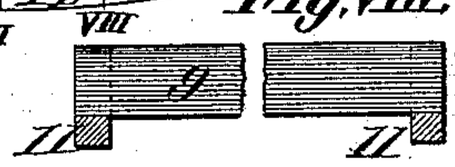

Fig. VI.




Attest
E. C. Knight
S. Stoner.

Fig. VII.


Fig. VIII.




Inventor:
H. S. Albrecht
By Knight Bros
atty's

(No Model.) 3 Sheets—Sheet 3.

# H. S. ALBRECHT.

## PULVERIZER.

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Fig. IX.

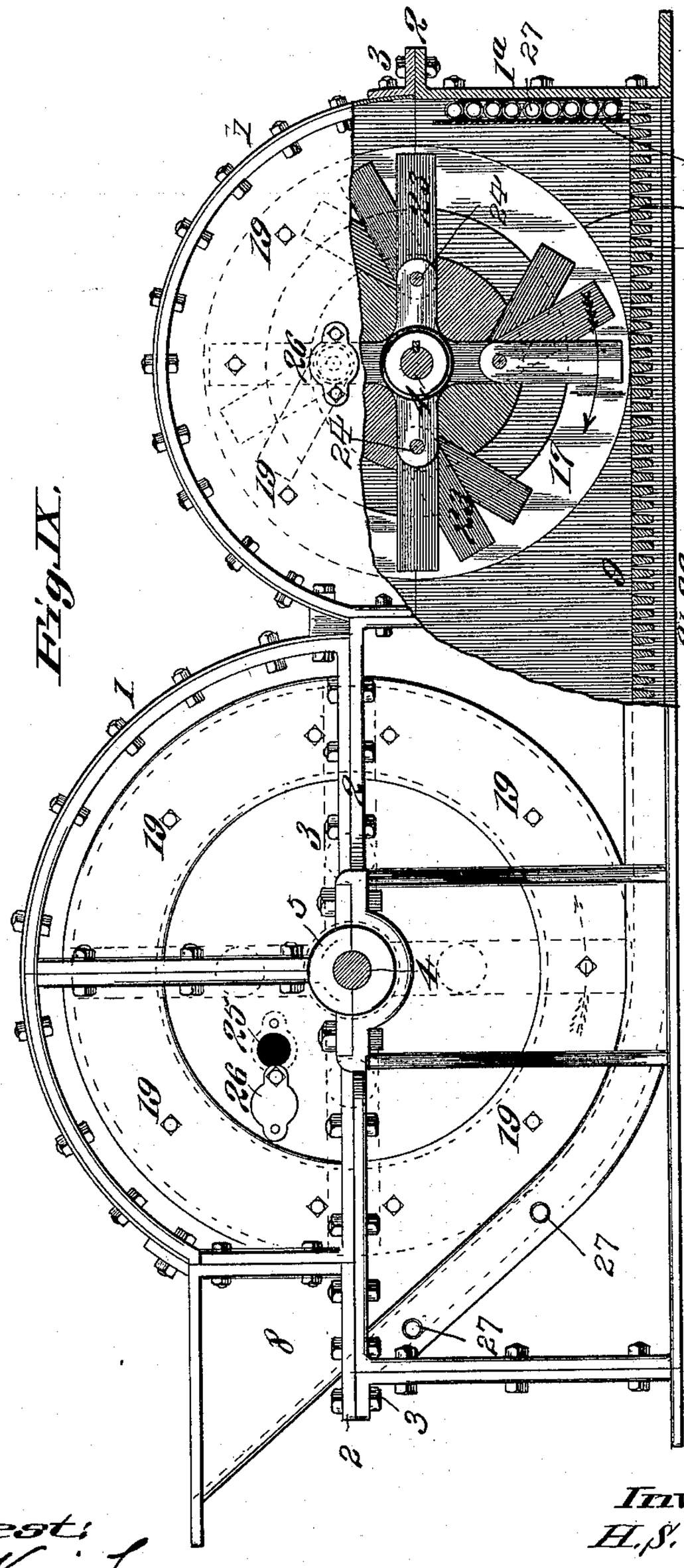



Fig. XI.

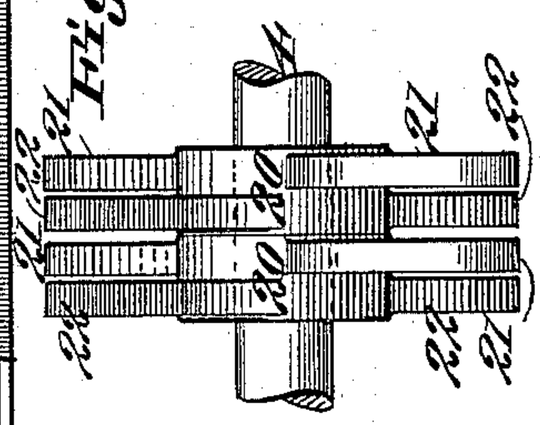
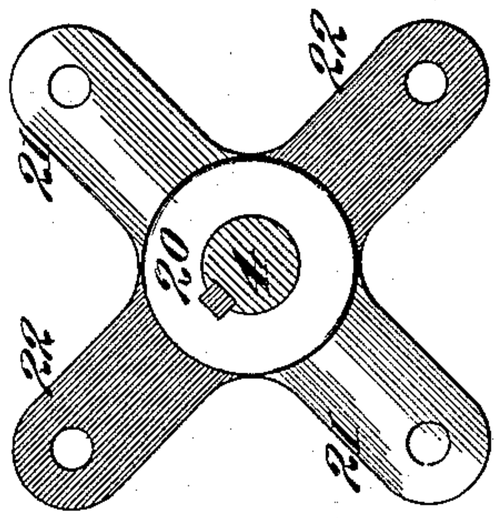



Fig. X.




Attest:
E. L. Knight
Stanley Stoner

Inventor:
H. S. Albrecht.
By Knight Bros. atty's

# UNITED STATES PATENT OFFICE.

HERMAN S. ALBRECHT, OF ST. LOUIS, MISSOURI.

## PULVERIZER.

SPECIFICATION forming part of Letters Patent No. 604,283, dated May 17, 1898.

Application filed May 3, 1897. Serial No. 634,894. (No model.)

*To all whom it may concern:*

Be it known that I, HERMAN S. ALBRECHT, a citizen of the United States, residing in the city of St. Louis, in the State of Missouri, have invented a certain new and useful Improvement in Pulverizers, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My present invention relates to certain improvements in the class of machine set forth in my Patent No. 571,588, issued November 17, 1896, and is designed for pulverizing or breaking ore, stone, clay, shale, and the like and for mixing paints and other substances.

My present invention consists in features of novelty hereinafter fully described, and pointed out in the claims.

Figure I is a top or plan view of my improved machine with part of the casing or housing removed. Fig. II is a detail bottom view of the throat or mouth part of the machine. Fig. III is a vertical section taken on line III III, Fig. I. Fig. IV is a vertical section taken on line IV IV, Fig. III. Fig. V is a side view of one of the bars that form the screen of the machine. Fig. VI is an enlarged detail view of one of the bar-supporting plates, showing the bars in section. Fig. VII is a section taken on line VII VII, Fig. VI. Fig. VIII is a section taken on line VIII VIII, Fig. VI. Fig. IX is a side elevation showing my invention in the form of a double machine. Fig. X is an enlarged detail view showing the shaft and one of the spiders secured thereto. Fig. XI is a detail side view of the shaft with two of the spiders in place.

Referring to the drawings, 1 represents a case or housing, preferably made of two parts provided with meeting flanges 2, secured together by bolts 3.

4 represents a shaft journaled in the housing by means of boxes 5. This shaft is provided with a driving-pulley 6 and a fly-wheel 7. The housing is provided with an opening or mouth 8, through which the material to be acted upon is introduced, and in the lower part of the housing there is a screen composed of a number of bars 9, fitting in notches 10, formed in plates 11, that are preferably made in sections, as shown in Figs. III and VI. There is a plate 11 on each side of the machine. These plates fit in grooves 12, formed in the inner faces of the sides of the housing, as shown in Fig. IV, and when they are inserted they are held in position by the bars 9, a sufficient number of the bars having notches 13, the ends 14 of these bars fitting in notches $10^a$, which are of less depth than the other notches in the plates, thereby permitting a portion 15 (see Fig. VII) of these bars to extend down and bear against the sides of the plates, thus holding the plates in position in a cheap and effective manner. By taking off the top half of the housing and removing the bars the plates 11 may be taken out by moving them in the grooves 12, and thus the plates and bars may readily be renewed when necessary.

17 represents hardened-metal rings fitting in grooves 18, made in the inner face of the sides of the housing inside of the grooves 12 and of less width than the grooves 12. The function of these rings is to act as wear-plates to protect the housing from wear at the points of greatest abrasion between the material being acted upon and the housing. These rings may readily be renewed as they become worn out, and experience has demonstrated that their use adds materially to the life of the machine, as the frame or housing in the absence of these rings is rapidly worn away by the material being acted upon, and when worn away the machine becomes useless. By making the grooves 12 of greater depth than the grooves 18 the bars 9 will be retained in place even should the rings 17 become worn out as a whole or in places before they are renewed. The rings 17 may be held in place by bolts 19 or by other suitable means.

Secured to the shaft 4 are a number of spiders, each spider consisting of a hub 20, having a pair of radial arms 21 in line in one vertical plane and a pair of radial arms 22 in line in another vertical plane and arranged at right angles to the other arms. (See Figs. X and XI.)

23 represents hammers in the form of flat strips of metal, these hammers being secured to the arms of the spiders by means of bolts 24, that extend entirely through the arms of the spiders, as shown in Fig. IV, the spiders being adjusted on the shaft so that their respective arms will register, thus allowing one

bolt to be employed for connecting all of the hammers of each set of the arms to said arms. The arms 21 of each spider are in line and the arms 22 of the same spider are in line; but the arms 21 are out of line with the arms 22, as shown in Fig. XI, the object of this construction being to permit the hammers of each pair of arms of each spider being set out of line with the other pair of hammers of each spider, thus spreading the entire hammer-surface of all the spiders of the machine entirely across the cylinder instead of having spaces between the hammers of the different spiders, as would be the case if all of the arms of each spider were formed in line.

Each side of the housing or casing is formed with a hole 25, that may be closed by a cover 26. (See Fig. IX.) These holes are located the proper distance from the shaft 4 to bring them opposite the bolts 24 when the cylinder (consisting of the spiders and hammers) is turned to the proper position, and then when it is necessary to renew the hammers the bolts may be withdrawn through the holes 25 and the hammers thus renewed by introducing new hammers through the opening or mouth 8 of the housing without taking the casing of the machine apart. When the upper half of the casing is formed in sections, as shown at the left of Fig. IX, the holes 25 would preferably be formed to one side of a vertical line through the shaft 4; but when the upper half of the housing or casing is formed in a single piece, as shown to the right of Fig. IX, the holes 25 would preferably be formed on a vertical line with the shaft 4.

27 represents steam-coils arranged within the housing at suitable points, these being protected by linings 28. The object of these coils is to dry or heat the material being treated when such drying or heating is necessary.

In Fig. IX, I have shown the machine of double form, as in my patent referred to, no further description of this, either as to the construction or operation of the machine, being here necessary, except to state that when the machine is made double the screen-surface would be arranged in a horizontal manner, as shown in Fig. IX, instead of in a circular manner, as shown in Fig. III. The plates 11 may be taken out in this form of the machine by removing the rear section $1^a$ of the housing.

I claim as my invention—

1. A pulverizer comprising a housing having grooves in the inner faces of the side walls thereof, a revolving cylinder, sectional removable side plates having notches and fitting in the grooves, and the bars having their ends fitting in the notches of the side plates and providing a screen; substantially as described.

2. A pulverizer comprising a housing having grooves in the inner faces of the side walls thereof, a revolving cylinder, sectional removable side plates having notches of different depths and fitting in the grooves, the bars fitting in the deepest notches, and the bars having notched ends fitting in the notches of less depth to hold the side plates in position independent of other fastenings; substantially as described.

3. A pulverizer comprising a housing having inner and outer grooves in the inner faces of the side walls thereof, a revolving cylinder, sectional removable side plates having notches and fitting in the outer grooves, the bars having their ends fitting in the notches of the side plates, and providing a screen, and the wear-plates fitting in the inner grooves; substantially as described.

4. A pulverizer comprising a housing having side walls formed with an outer groove, and an inner groove of less depth than the outer groove, a revolving cylinder, sectional removable side plates having notches and fitting in the outer grooves, the bars having their ends fitting in the notches of the side plates and providing a screen, and the wear-plates fitting in the inner grooves; substantially as described.

5. A pulverizer consisting of a housing, a revolving cylinder, and a screen; said cylinder being composed of a shaft, a number of spiders each having two pairs of arms, and hammers pivoted to the arms of the spiders; one pair of arms of each spider being located to one side of the other pair of arms of said spider, substantially as set forth.

HERMAN S. ALBRECHT.

In presence of—
E. S. KNIGHT,
STANLEY STONER.