E. M., J. S. & W. H. Gordon.

Starch Mach.

No. 5,940. Patented Nov. 28, 1848.

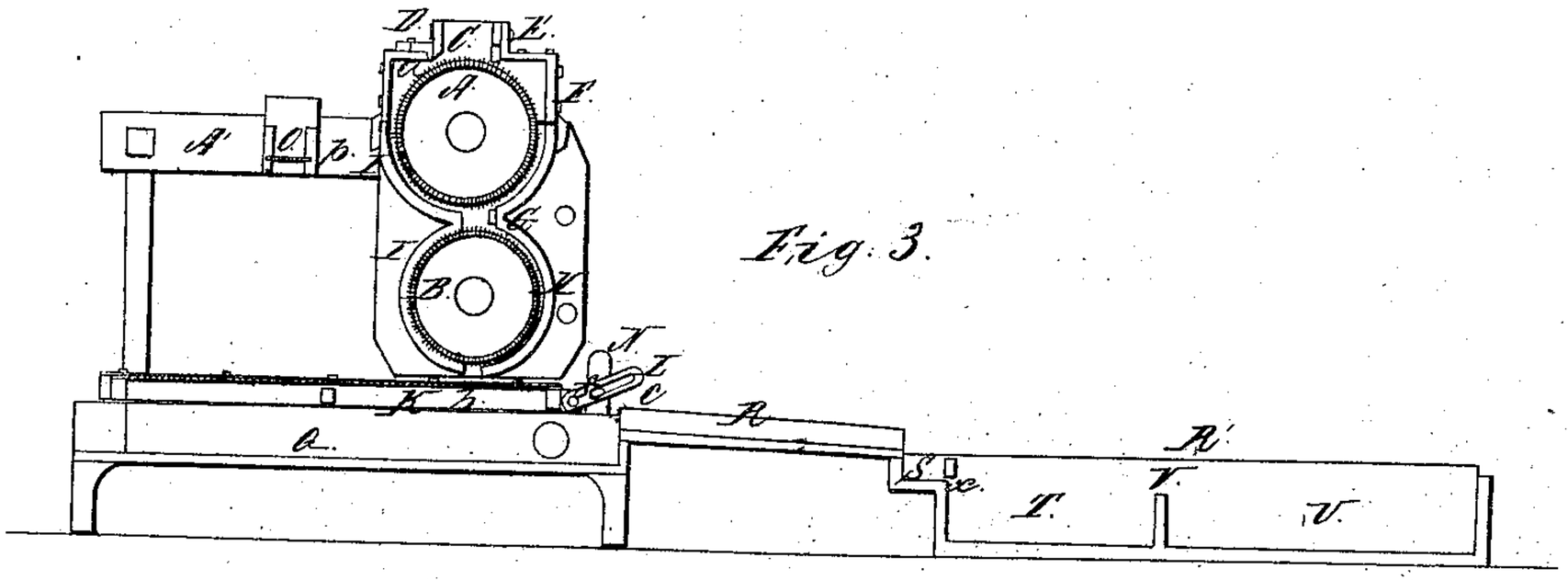
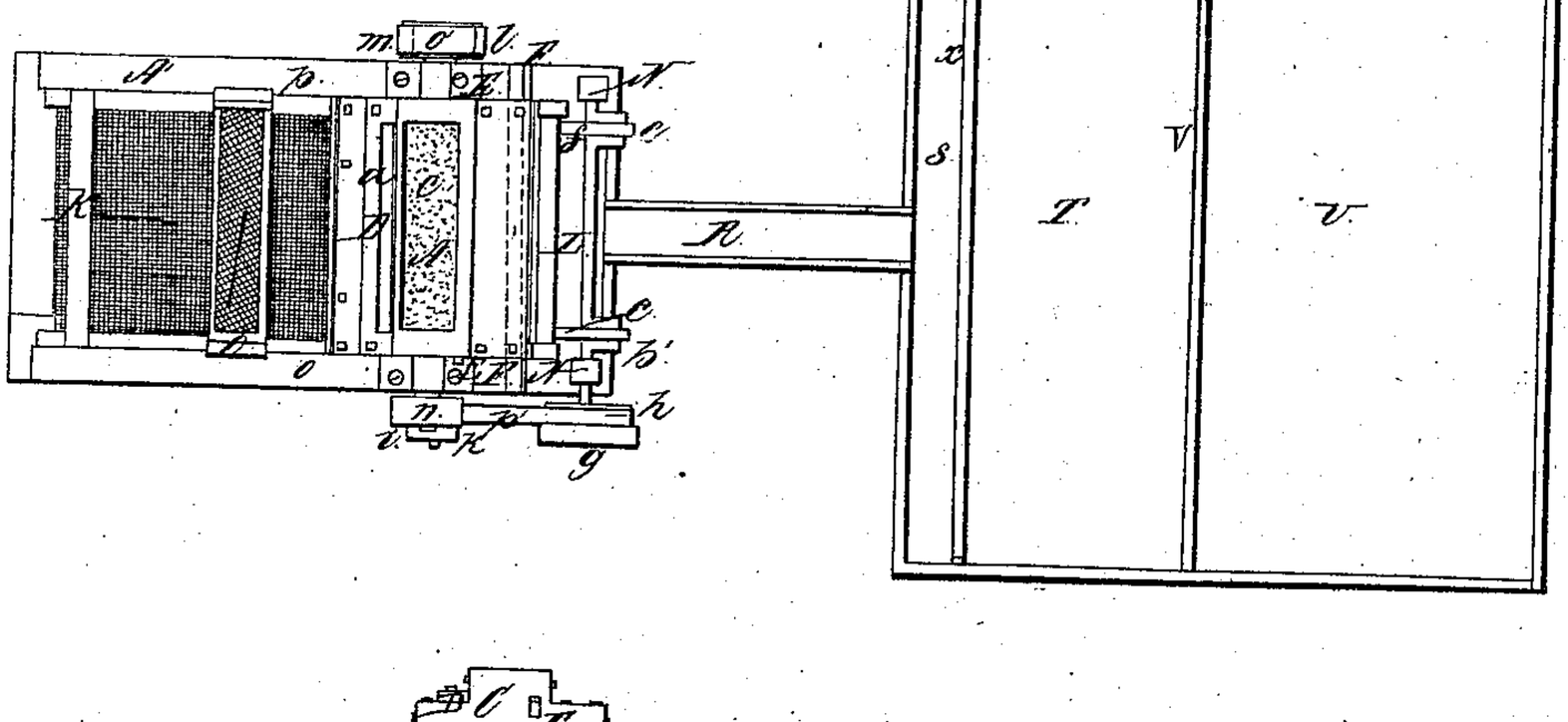


Fig. 3.

Fig. 1.



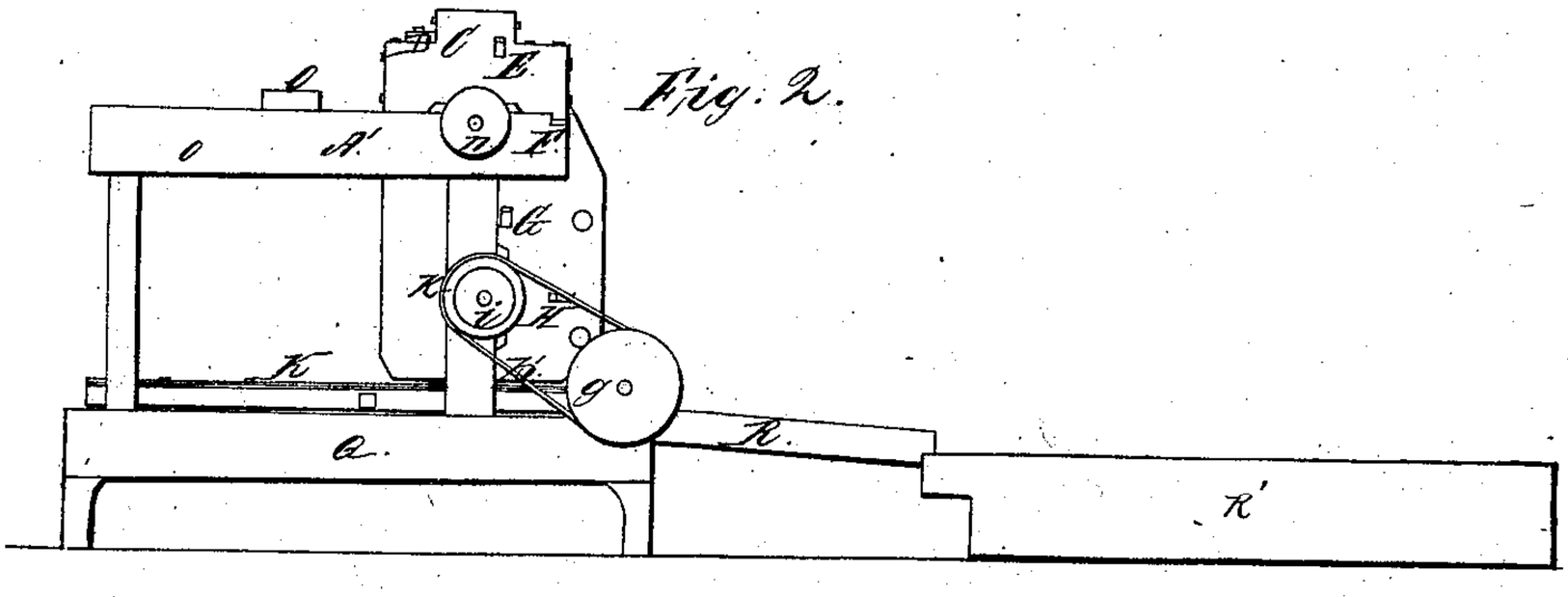


Fig. 2.

UNITED STATES PATENT OFFICE.

E. M. GORDON, JONA. S. GORDON, AND W. H. GORDON, OF WOODSTOCK, NEW HAMPSHIRE.

IMPROVEMENT IN THE MANUFACTURE OF POTATO-STARCH.

Specification forming part of Letters Patent No. **5,940**, dated November 28, 1848.

To all whom it may concern:

Be it known that we, ENOCH M. GORDON, JONATHAN S. GORDON, and WILLIAM H. GORDON, of Woodstock, in the county of Grafton and State of New Hampshire, have invented certain new and useful Improvements in Machinery for Making Potato-Starch; and we do hereby declare that the same are fully described and represented in the following specification and accompanying drawings, letters, figures, and references thereof.

Of said drawings, Figure 1 represents a top view of our improved starch apparatus. Fig. 2 is a side elevation of it. Fig. 3 is a central longitudinal and vertical section of it.

In said drawings, A′ denotes the main framework, constructed in any proper manner so as to sustain the operative parts of the machine to be described.

A and B are two rasping-cylinders, each of which consists of a wooden drum covered on its curved surface with sheet metal made rough by punch-holes so made through it as to leave their burrs projecting from its external curved surface. Above the first or upper rasping-cylinder, A, is a hopper, C, and a supplying water-fountain or reservoir, D, through the bottom of which reservoir is a long slit or suitable aperture, *a*, for the purpose of allowing water to pass in a thin sheet or moderate stream into the hopper in order to prevent the surfaces of the rasping-cylinders from getting foul with fibrous matter. In front of the upper rasping-cylinder are two gage-bars, E F, which are disposed as seen in the drawings. Each of them should have wedges or other suitable contrivances adapted to it, so as to enable it to be advanced toward the rasping-surface of the cylinder as near as it may be necessary. The lower cylinder, B, also has two such gage-bars G H, which are similarly applied to it, and are arranged as seen in Figs. 2, 3. A shrouding or case, I, is made to surround the two rasping-cylinders. It has a long slit or opening, *b*, made through the bottom or lower part of it, the same being to allow the pulp to pass out of the case and fall upon a sieve, K, arranged underneath it, and vibrated horizontally with a quick reciprocating motion by means of a crank-shaft, L, which is supported in bearings in the tops of standards N N, and has two bell-cranks, *b′ c*, and two connecting-rods, *e f*, respectively jointed to the cranks and the frame of the sieve. On one end of said shaft are two pulleys, *g h*. There are also two pulleys, *i k*, on the near end of the shaft of the lower rasping-cylinder. There is also another pulley, *l*, on its opposite end, and pulleys *m* and *n* on the two ends of the shaft of the upper rasping-cylinder. The driving-power is applied to the pulley *n*. An endless belt, *o′*, passes around the two pulleys *m* and *l* and communicates motion to the lower cylinder and its shaft, which also, by means of another endless belt, *p′*, made to pass around both of the pulleys *g* and *i* or *h* and *k*, puts the crank-shaft in motion, so as to operate the sieve.

O is a trough, which is supported by and made movable on the top rails, *o p*, of the frame A′ of the machine. Said trough has a great number of small holes made through its bottom, in order to allow water poured into the trough to descend in a shower or spray upon the sieve beneath it. Said trough should be sustained upon the rails *o p* in such manner as to be capable of being moved toward or from the upper cylinder in order to cause the shower of water proceeding from it (the trough) to be equally distributed upon the whole surface of the sieve should the same be necessary. Under the sieve is a shallow reservoir or vat, Q, which, by means of a spout, R, communicates with a transverse distributing-trough, S, raised above a large and shallow cistern or vat, R′, as seen in the drawings. The said vat R′ is divided into two or more compartments, T U, by one or more cross-partitions, as seen at V. It should be about sixteen or eighteen feet square and a foot deep for a stream that flows into it at the rate of twenty gallons per minute. The said partition or partitions V may be an inch or two higher than that side of the vat over which the liquid is to flow in a thin sheet. This, however, will create a stronger current, one more apt to disturb the starch, than would be made when the partitions are made lower than the said side.

The operation of the afore-described machinery is as follows: The rasping-cylinders being put in revolution and the hopper filled with potatoes, the said potatoes will be rasped or reduced to a pulp by the action of the two cylin-

ders and their gage-bars. The said pulp after passing out of the case or shrouding of the cylinders is received upon the sieve beneath them, the motion of which causes the pulp to be distributed over its surface. The shower of water which falls on the pulp separates the starch from the mass and carries it through the sieve into the vat below it. From the said vat the combined liquor and starch flow into the distributing-trough S of the settling-vat R′. The starchy liquid spreads out through the trough and passes in a thin sheet over the side of the same, (which may be properly formed or cut down so as to admit of the same,) or through a long slot, *x*, made through the said side. It is received into the adjacent compartment T of the settling-vat, which it will fill to the level of the top of the partition V, and will then flow over said partition and into the next compartment until it is also filled. The liquor will next rise upward and flow over the side or end *a′* of the vat; or, in other words, the water will rise up and flow over the said side, while the starch or feculous matter will subside or be deposited on the bottom of the vat.

The common practice is to use very deep vats—that is to say, vats of four or six feet in depth—and to fill the same with the starchy solution, and allow the said solution to stand still six or eight hours, or until it has deposited its starch. When this is effected, the water is drawn or pumped off or removed and the starch afterward taken out.

The difference between our mode of operating and that heretofore in use will be readily seen. By our apparatus we are able to maintain a constant or continued operation, whereas by the use of a deep vat in the manner as heretofore practiced the water must be suffered to remain quiet for some length of time before it can be drawn off and the starch removed.

In our apparatus, as our vat is shallow or about one foot in depth, we can readily gain access to the deposited starch so as to remove it as fast as it may be necessary.

By using the aforesaid combination of two rasping-cylinders and their gages or gage-bars we are enabled to produce much better pulp than can be made by the old single rasping-machines.

We therefore claim—

1. The distributing-trough S, as combined with the subsiding-vat R′, and vat Q, and used in the manner and for the purpose substantially as specified.

2. Our improvement of using a shallow subsiding-vat in the manner and for the purpose substantially as described, instead of using a deep one as heretofore employed.

In testimony whereof we have hereto set our signatures this 6th day of December, A. D. 1847.

E. M. GORDON.
J. S. GORDON.
W. H. GORDON.

Witnesses:
JACOB B. DEMERITT,
ENOCH GORDON.