

S. BENTZ.  
Smut Machine.

No. 2,193.

Patented July 23, 1841.

Fig: 2.

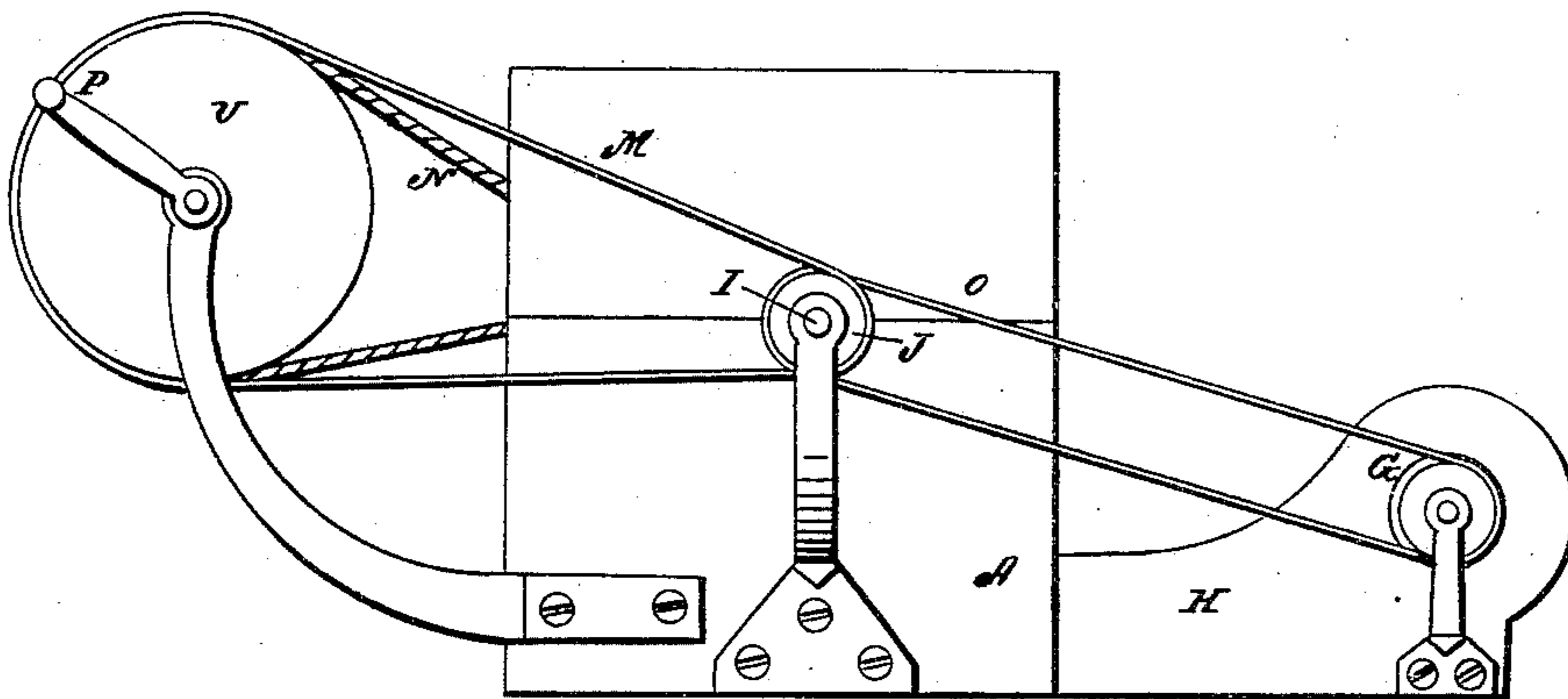


Fig: 1.

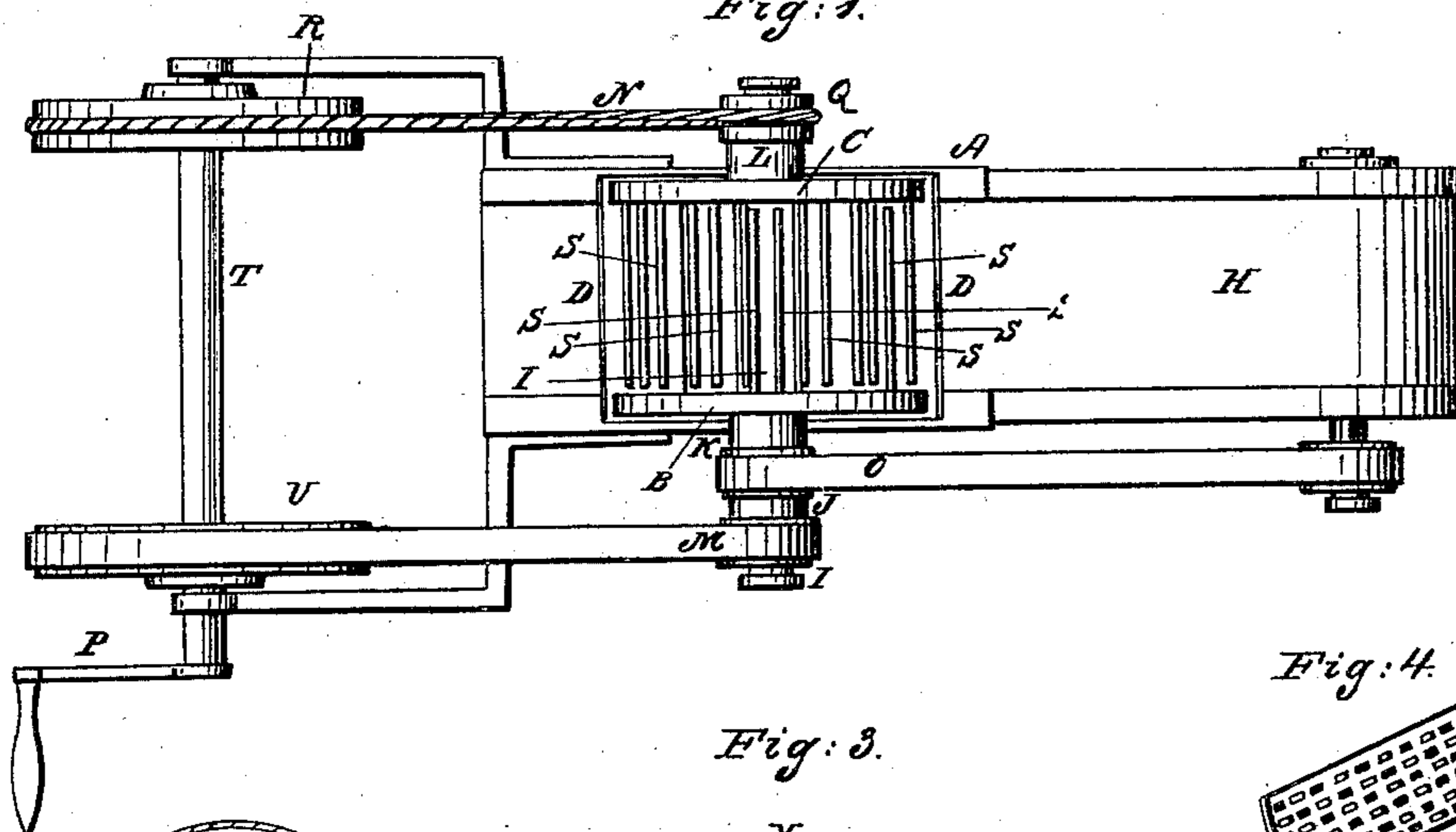


Fig: 3.

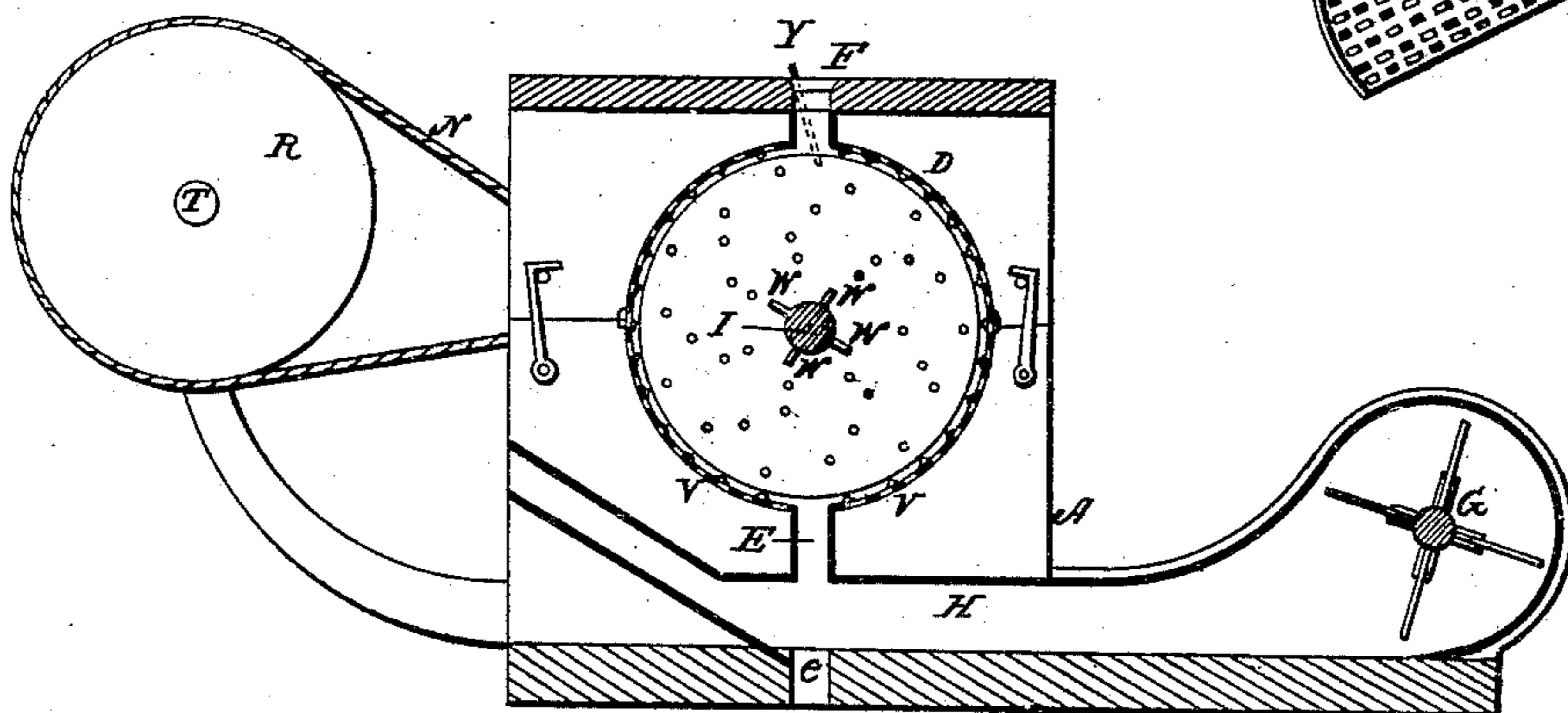
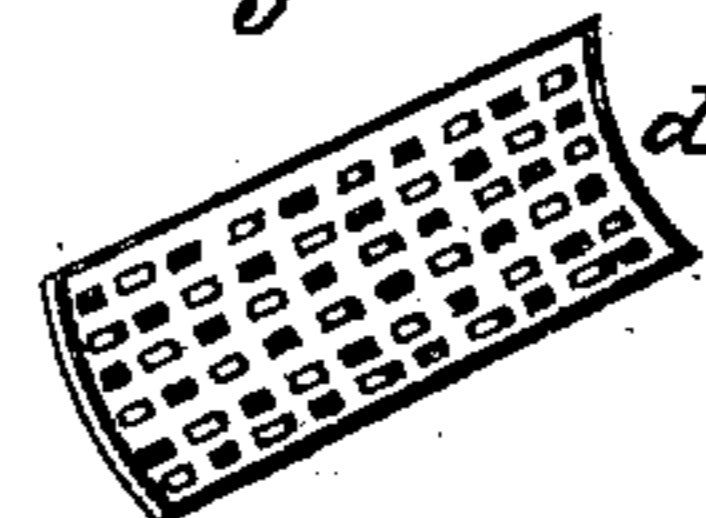


Fig: 4.



# UNITED STATES PATENT OFFICE.

SAMUEL BENTZ, OF BOONSBORO, MARYLAND.

MACHINE FOR CLEANING GRAIN, &c.

Specification of Letters Patent No. 2,193, dated July 23, 1841.

*To all whom it may concern:*

Be it known that I, SAMUEL BENTZ, of Boonsboro, in the county of Washington and State of Maryland, have invented a new and useful Machine for Cleaning Grain and for other Purposes, which is described as follows, reference being had to the annexed drawings of the same, making part of this specification.

Figure 1 is a top view of the machine with the cap removed so as to expose the revolving beaters. Fig. 2 is a side elevation with the cap in its proper place. Fig. 3 is a vertical transverse section through the center of the revolving beaters. Fig. 4 is one of the segments showing the form of the teeth and apertures in said segment.

Similar letters refer to corresponding parts.

A frame A of suitable size and strength to contain the several parts of the machine, hereafter described, is constructed of proper materials. In this frame are contained two revolving cylinders B, C, of beaters turning in opposite directions, the beaters of one cylinder revolving within those of the other; a perforated cylinder D in which the beaters revolve composed of two semicircular hollow segments armed with angular teeth, one of which segments forms the concave; in the bottom of which is a discharging spout E—the other segment forms the cap in the vertex of which is a feeding hopper, F; a revolving fan G at one end of the frame for creating a blast for cleaning the grain, the trunk H of which passes under the concave to the opposite side thereof and through which the grain falls vertically; and the gearing by which the several parts are put in motion.

The main shaft I of the revolving beater B is placed across the frame in the center of the case D in suitable boxes in the frame, its ends projecting a convenient distance beyond the sides thereof to receive the pulleys J, K, and mandrel L, around which are passed the bands M, N, O, leading from the driving power P and to the fan G, and also pulley Q of the hollow mandrel L for another band N, leading to a pulley R of the driving power. On this main shaft I is fixed one of the cylinders B carrying a set of beaters S and turning with said shaft. The beaters S are round, square, or other shaped bars of iron set parallel in a circle around the inner face of the cylinder pro-

jecting inward a sufficient distance so as to revolve close to the beaters of the other cylinder without touching them. The other or corresponding cylinder C is secured on the end of a hollow mandrel L which turns on a part of the main shaft I which is reduced in diameter and made perfectly round and smooth to allow it to turn freely thereon; the beaters S S of which cylinder project inward toward the other cylinder and revolving among its beaters S without touching them in a contrary direction, as before stated. The band N passing around the pulley of this cylinder (which is fixed to the mandrel) is crossed and leads around a larger pulley R on the end of the driving shaft T.

The band M which turns the cylinder B fixed on the main shaft I is passed around a small pulley J on its outer extremity and conducted to another large pulley U on the driving shaft T. The driving shaft T is turned by a crank P by manual or other power, or in any other required manner.

The hollow cylindrical case D surrounding the revolving cylinders is composed of cast iron segments—one of which is represented at d, Fig. 4, placed in circular grooves (of greater diameter than the diameter of the cylinders) made in the cast iron heads V held together by screw bolts, said segments being cast with tenons on their ends to fit into said grooves to keep them in their proper places, and with teeth or projections of an angular shape, against which the grain is thrown by the revolving beaters which, from their angular form, again throw the grain back toward the center of the cylinder to be again acted upon by the revolving beaters, said segments being also cast with oblong apertures between the teeth (arranged so as not to weaken the plates) for the escape of dirt driven out from the case by a small fan of 2 or more wings W formed on the main shaft I within the circle of the beaters S, said wings W being set in the circumference of said shaft.

The case D is stationary, in the vertex of which is left an opening to admit the lower end of the hopper F which is made in the usual manner. In the lower part of the case is left another opening to admit the discharging spout E.

The fan G is made in the usual manner. It is arranged in the rear end of the frame. The tube or trunk H leading from the cir-

cumference of the case surrounding the fan for conducting the blast under the vertical discharging spout E is curved downward from the fan—then curved under the case of beaters and then carried upward behind it in an inclined plane where its end is left open for the discharge of dirt, &c. An opening *e* is made in the bottom of the fan tube directly under the discharging spout.

10 An inclined or vertical plate or board Y is placed in the hopper extending down near the beaters for the purpose of preventing the grain escaping between the beaters and lower-edge of said board.

15 The beaters are arranged in concentric circles but not in lines radiating from the center.

The hollow cylindrical case may be made of punched sheet iron if preferred. The upper part of the case is secured upon the lower part by hooks or other suitable fastenings.

Operation: The machine is put in motion by turning the shaft T by the crank P or otherwise. The band M turns the cylinder and beaters B S to the right. The opposite or crossed band N turns the cylinder and beaters C S simultaneously to the left. The band O turns the fan G. The grain to be cleaned from smut, white caps, and other impurities is put into the hopper F and introduced to the cylinders thereby. It is then met by the contrary revolving beaters and thrown violently about inside the cylinders and case in every direction from one set of beaters to the other and against the inclined projections or teeth of the concave from which it again rebounds toward the center of the cylinders where it is met by the revolving fans W on the main shaft I which again throws it toward the circumference of the cylinder and also creates a strong blast of wind which drives the smaller particles of dirt &c., thus broken and separated from the grain out at the

aforesaid apertures between the teeth of the cylindrical stationary case while the grain and remaining impurities descend and pass through the apertures in the bottom of the case where they are met by the blast from the fan G which separates the impurities from the grain and blows them out at the rear end of the curved trunk H while the grain in a clear state falls through the aperture *e* in the bottom of the trunk to a receiver below. The guard Y may or may not be inserted. In cleaning clover seed and rice the operation is the same.

This machine is applied to cleaning all kinds of grain and seed to which it may be adapted.

The machine may be varied in several particulars to suit the views of the farmer without departing from its main principle; for instance in order to separate the chaff from the grain more effectually the discharging spout may be made to conduct the grain and chaff into the throat of the fan to the left of the discharging aperture over the grain receiver so that as it rolls down the inclined plane of the throat to said aperture it shall be more effectually cleaned from the chaff which is blown out at the rear end.

What I claim as my invention and which I desire to secure by Letters Patent is—

The arrangement of the cylinders of beaters B s C s, the one set of beaters revolving within the other set in contrary directions in an armed perforated cylindrical case D in combination with the fan *b*, trunk H, and gearing arranged in the manner set forth for separating smut, white caps, hulls, chaff and all kinds of impurities from the several kinds of grain which the machine is adapted to clean.

SAMUEL BENTZ.

Witnesses:

WM. P. ELLIOT,  
C. H. MILSBERGER.