

H. E. SMITH.  
Grain Winnower.

No. 15,785.

Patented Sept. 23, 1856.

Fig. 1.

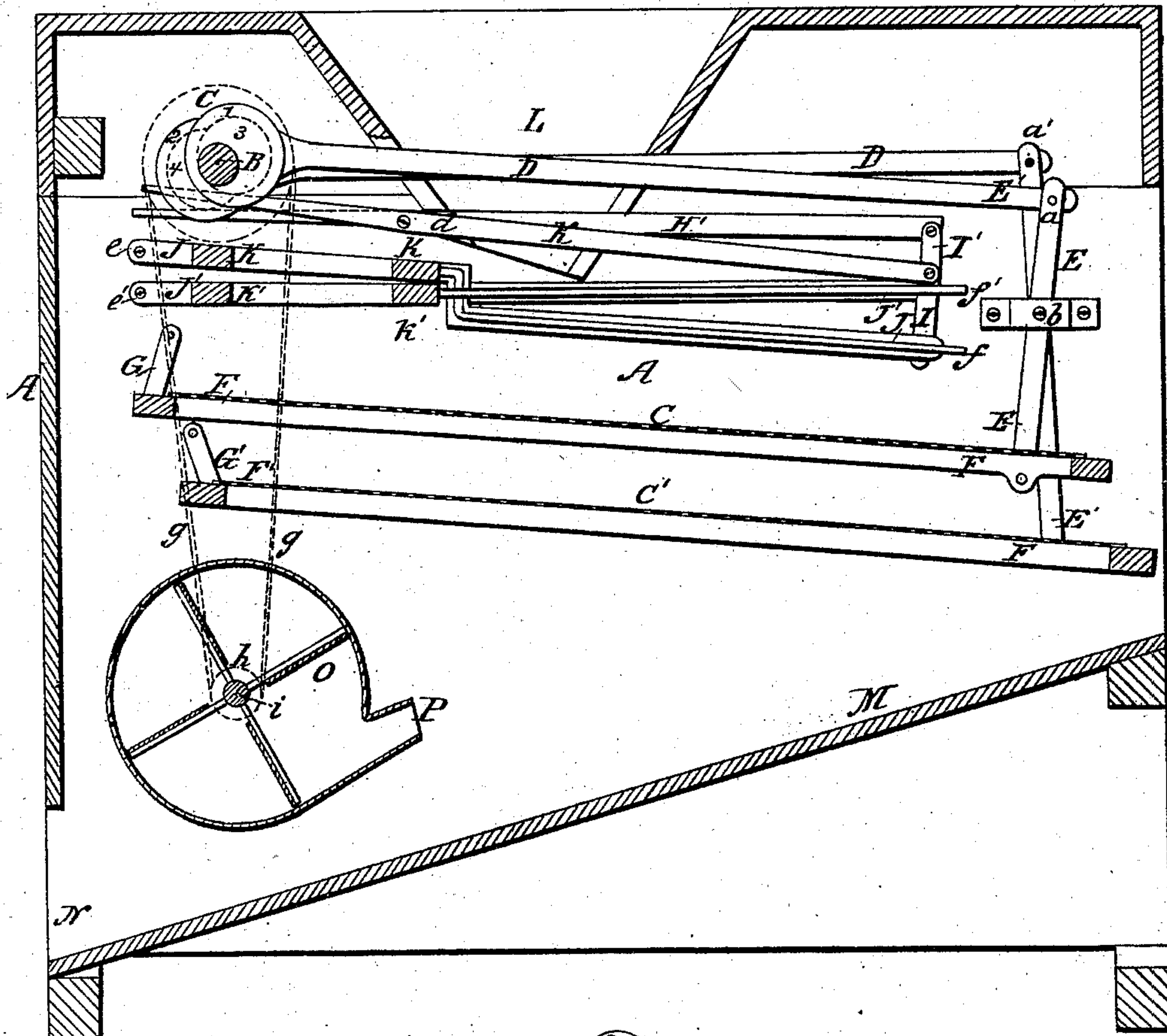


Fig. 3.

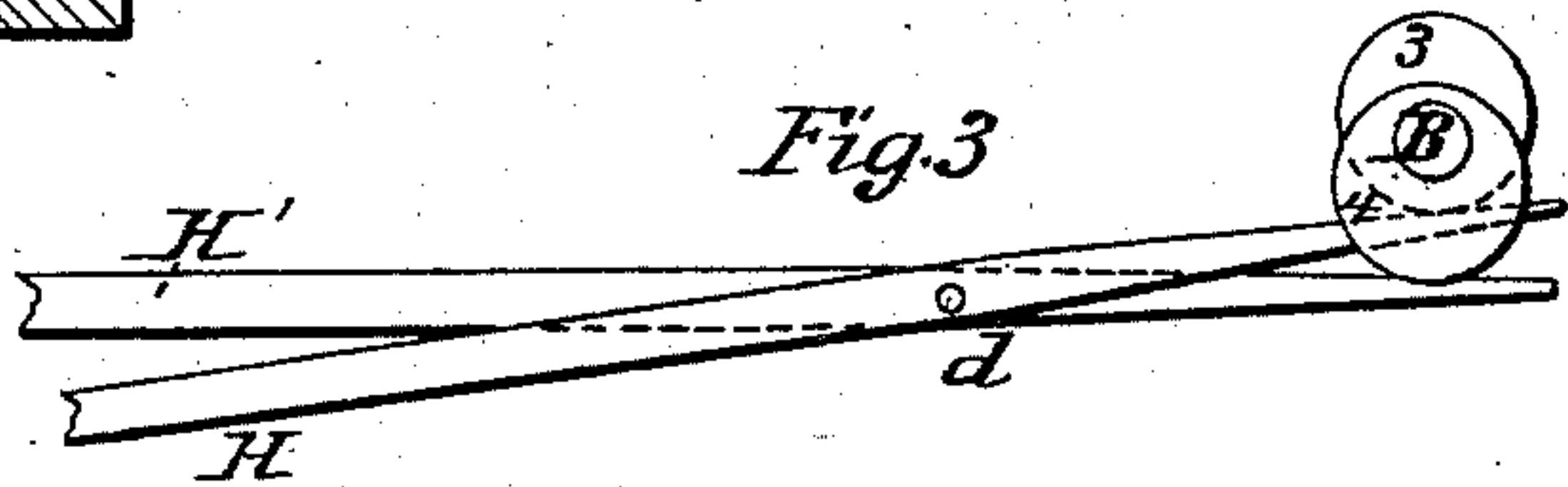
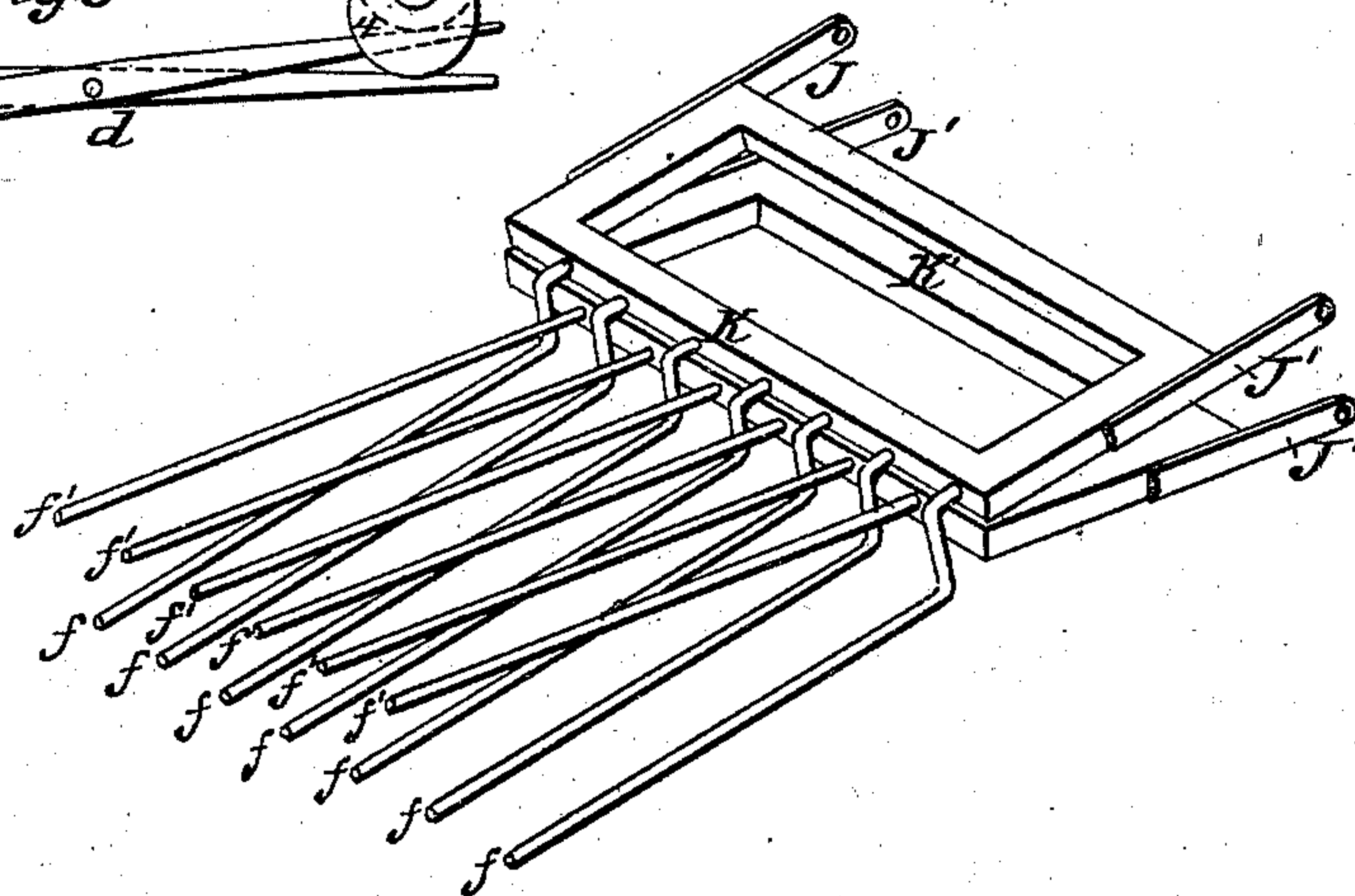


Fig. 2.





# UNITED STATES PATENT OFFICE.

H. E. SMITH, OF PHILADELPHIA, PENNSYLVANIA.

## GRAIN-SEPARATOR.

Specification of Letters Patent No. 15,785, dated September 23, 1856.

*To all whom it may concern:*

Be it known that I, HAMILTON E. SMITH, of the city and county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Grain-Separators; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part thereof, in which—

Figure 1, represents a longitudinal vertical section taken centrally through the machine. Fig. 2, represents in perspective the shaking fingers and their frames detached, and Fig. 3, represents two of the finger levers, and their cams also detached.

Similar letters of reference where they occur in the several figures, denote like parts of the machine in all.

My invention relates to the arrangement, and consequent operation of the shaking fingers and vibrating screens, one with the other, for the purpose of separating the straw from the chaff, grain, &c., and the further separation of the grain from the other impurities, as will be explained in connection with the drawings.

A, represents the case of the separator, which may be of such form and size as the character of the work to be done in it may require. A shaft B, is supported in suitable boxes placed on the top pieces of the frame, and near one end of the machine. This shaft B, may receive its motion from a belt or band passing around the pulley C, and around any first moving power.

Near each of the ends of the shaft B, are secured (either wrought or cast on said shaft) four cams 1, 2, 3, 4, which revolve with the shaft. Around two of the cams viz: 1, 2, pass straps or yokes, which fit in grooves cut in the peripheries of said cams, and said straps are then united to, or form, connecting rods D, D', which extend to near the other end of the machine, and are united by pivots *a*, *a'* to the upper ends of the levers E, E', which are pivoted to the case or frame A, at *b*—the lower ends of said levers E, E', being respectively connected to the frames F, F', which carry the screens *c*, *c'*. The rear ends of the screen frames, are hung to the frame by the links, or swinging arms G, G'.

The cams 1, 2, are placed diametrically opposite to each other on the shaft B, and through the connections just above de-

scribed, give a longitudinally reciprocating motion to the screens *c c'*—the one *c* having a shorter lever (E), than the other *c'*, will have a short quick vibration, while the latter will have a longer one; this however, may be changed, by either changing the length of the levers, or the shapes of the cams or their size—said cams for simplicity of construction being shown as full circles, but eccentrically placed on the shaft B. They may be of any form that will effect the necessary motion, and instead of a single vibration for one revolution of the cams, two or more may be produced by duplicating the throw of the cams.

The two cams 3 and 4, which are also at or near the ends of the shaft B, and placed thereon diametrically opposite to each other, operate upon two levers or treadles H, H', hung upon a fulcrum pin *d*. The opposite extreme ends of said levers being connected by links or straps I, I', to two bars J, J' which return back to the rear of the machine, and are pivoted respectively to the frame A, at *e*, *e'*.

To these bars J, J', are secured the two frames K K' (see Fig. 2) to which are affixed the fingers *f*, *f'*. The sectional figure of course represents but one set of the cams, rods, levers &c. The opposite side of the machine from that shown in Fig. 1, has the precise duplicates of them. The vibration of the treadles H, H', through the connections above described, give to the fingers *f f'*, a vertical motion which alternates—one set rising while the other set falls, and vice versa.

L, is the hopper through which the material to be cleaned and separated is fed into the machine. The fingers catch the straw and throwing it upward, and shake out the grain and everything but the straw, which passes off, the finer particles falling upon the upper screen *c*, of these particles the grain passes through said screen and the impurities off at the end thereof and of the grain falling upon the second screen *c'* another separation takes place, the grain going through said second screen, and falling upon an inclined board M, and thence out at an opening N. During the whole process of shaking and screening the material is acted upon by a blast from a fan blower O, the blast being directed upward through the screens by the nozzle or wind trunk P, which carries off the light material. The fan



blower may be operated from the pulley C, by a belt *g*, passing around said pulley C, and a smaller pulley *h*, on the shaft *i* of the fan.

5 Having thus described the nature of my invention what I claim therein as new and desire to secure by Letters Patent is—

The arrangement of the vertically vibrating shakers, and horizontally vibrating

screens for the purpose of separating grain 10 and other material, the whole being operated by a combination of mechanism, substantially such as herein described.

HAMILTON E. SMITH.

Witnesses:

JNO. B. KENNEY,  
CHARLES THOMPSON.