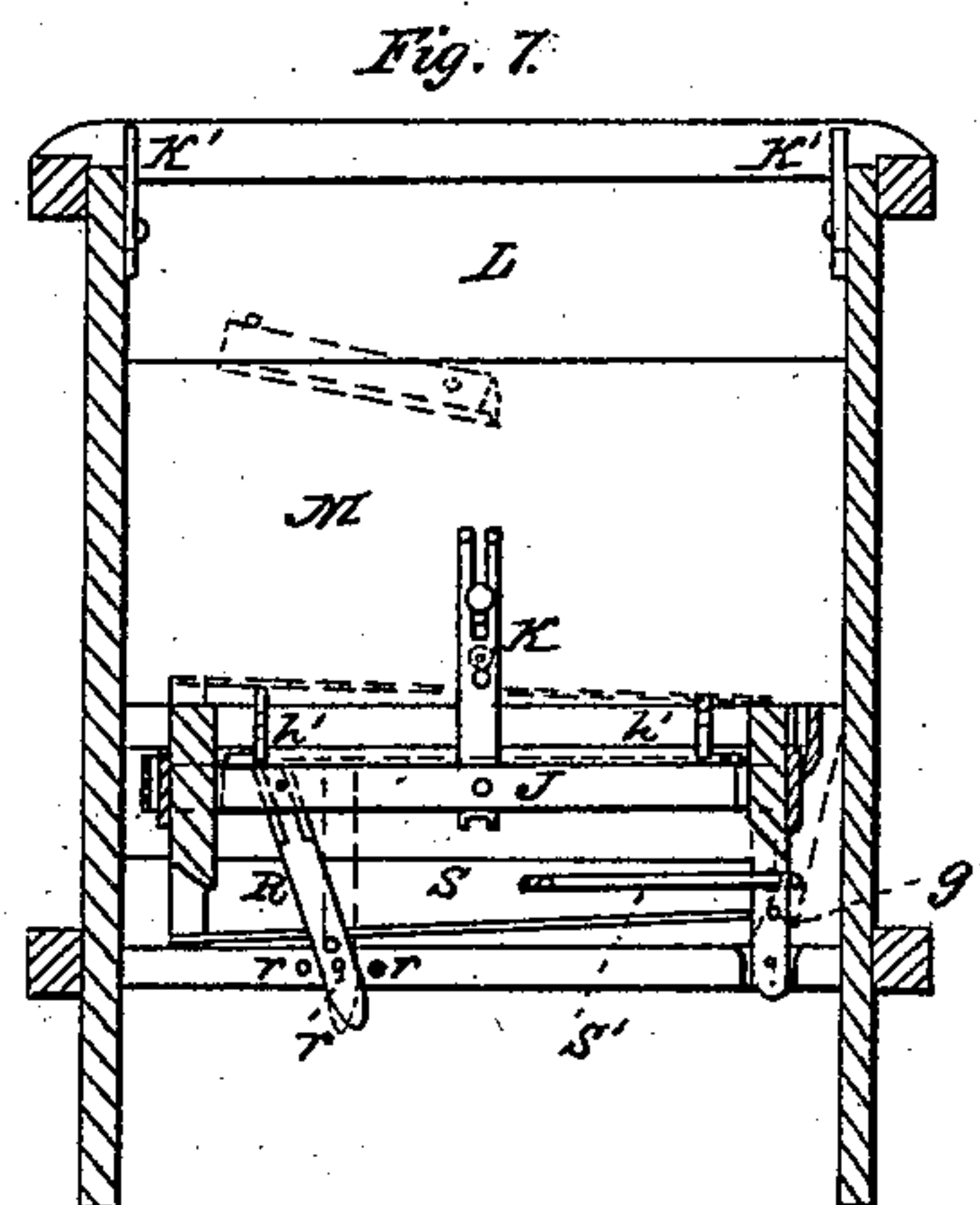
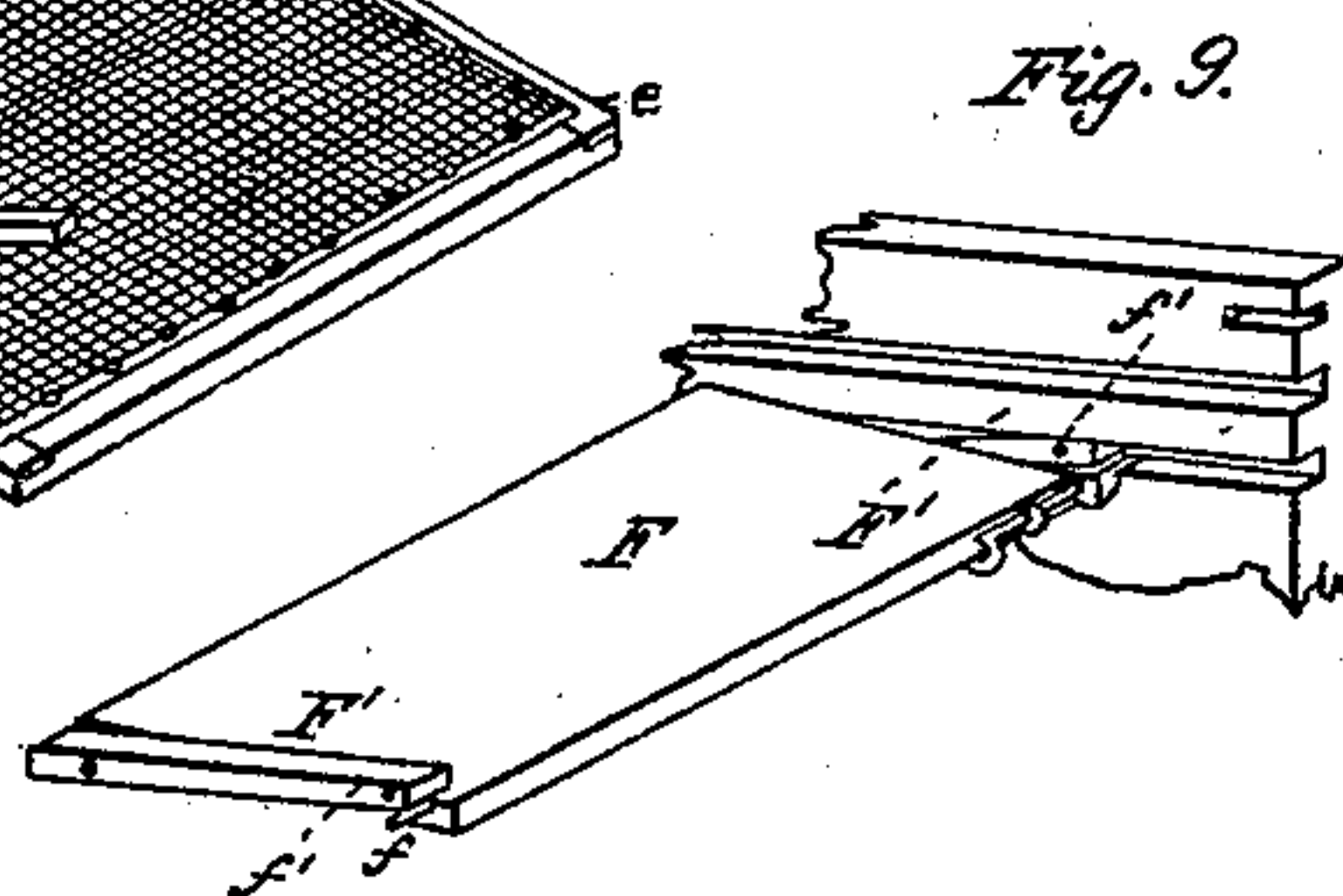
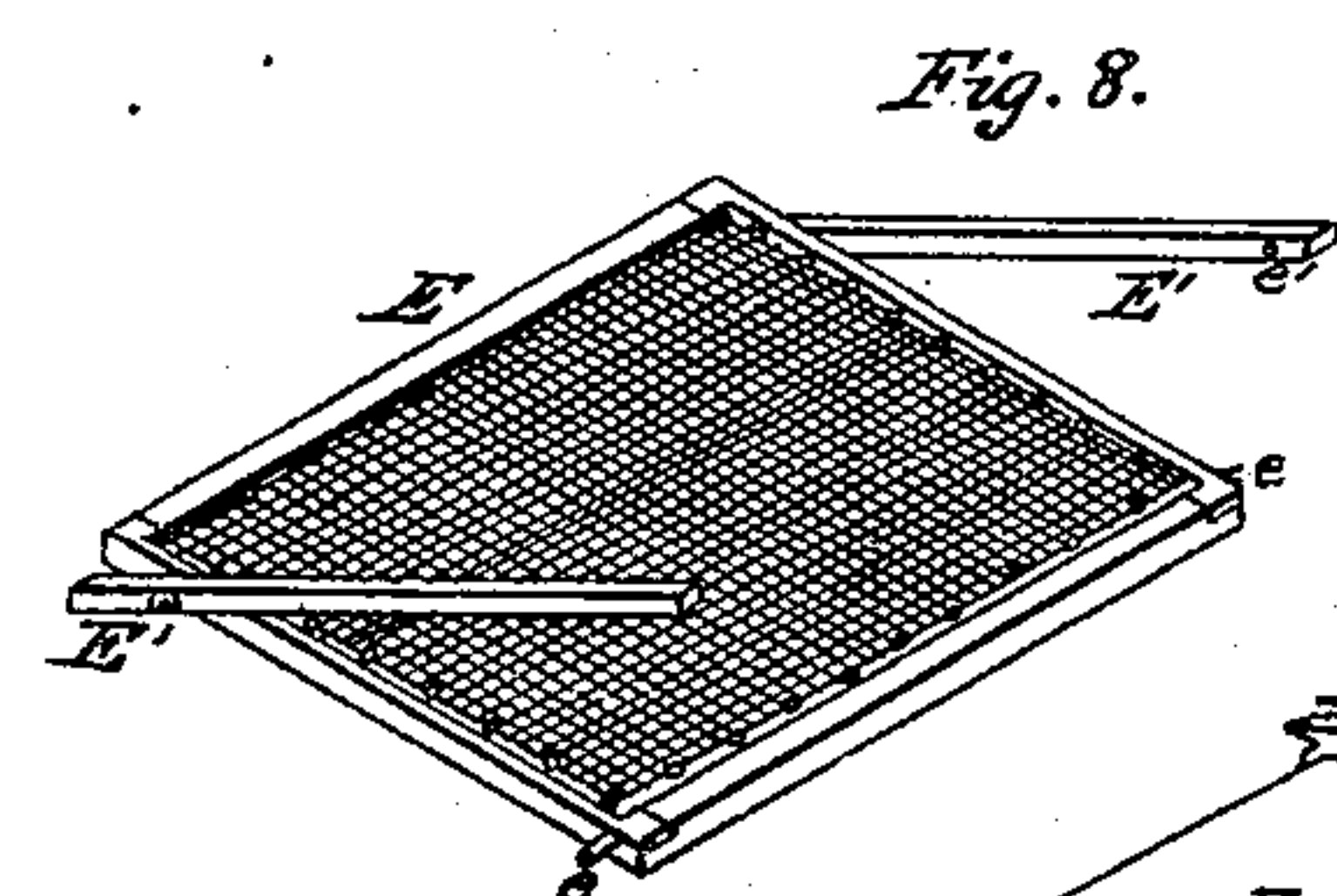
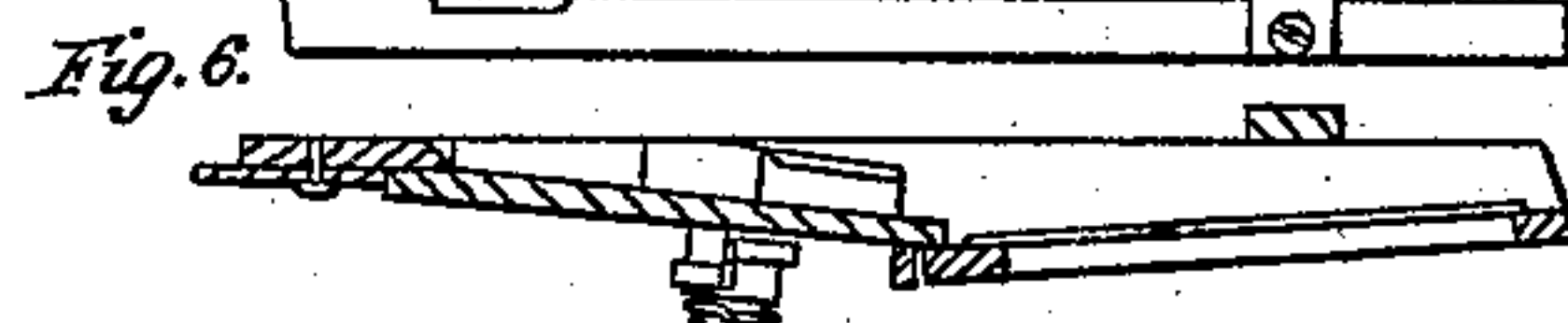
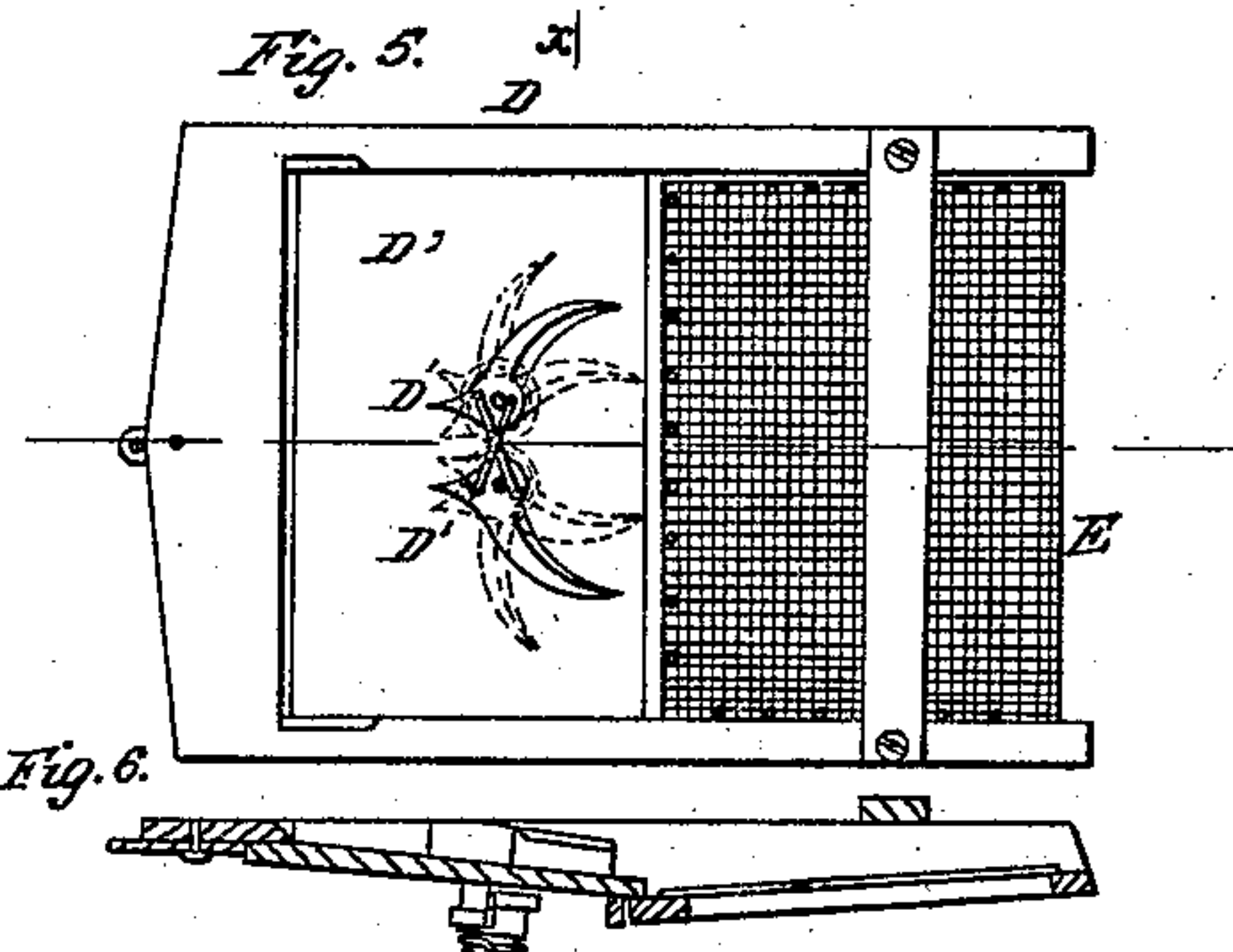
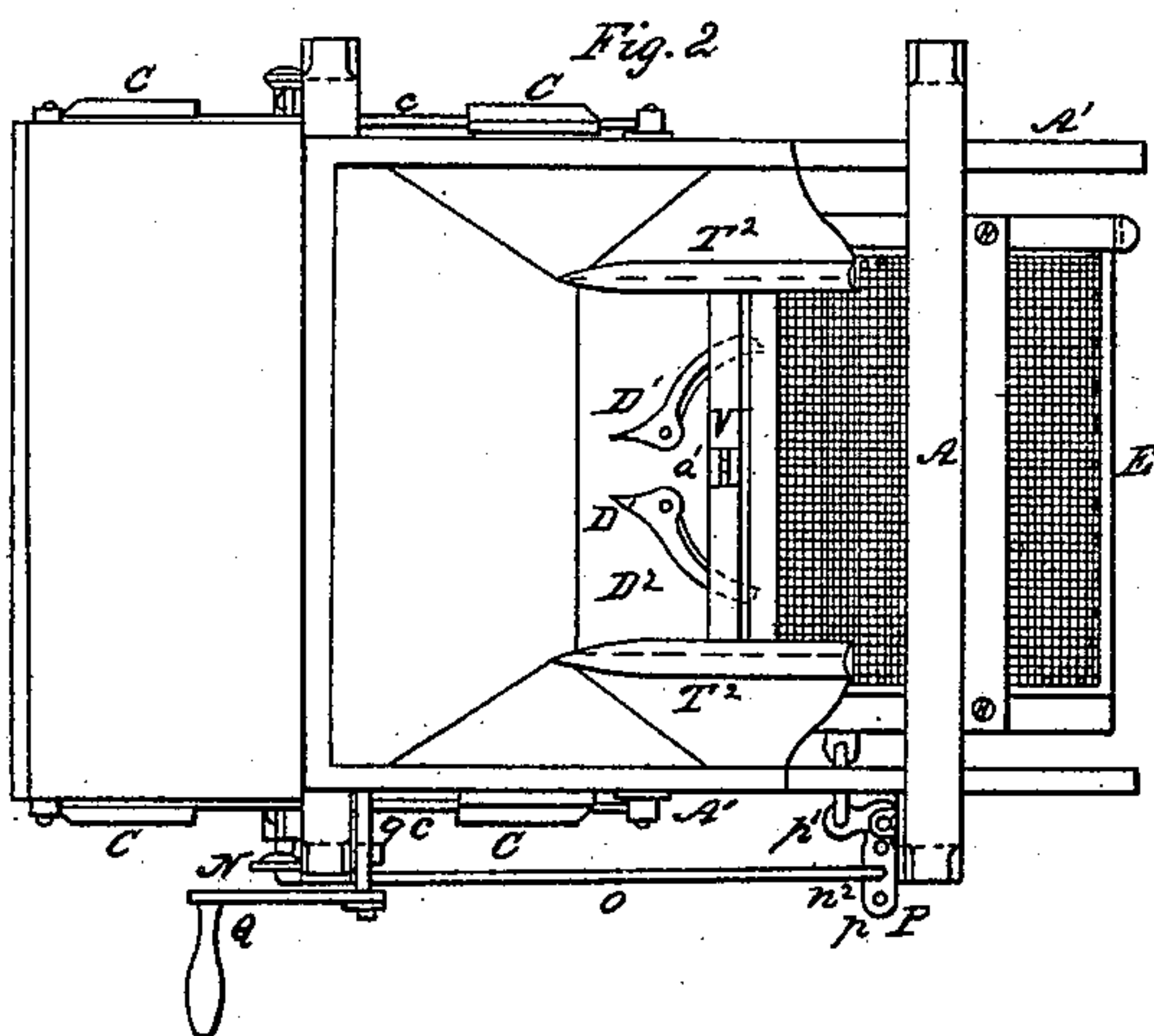
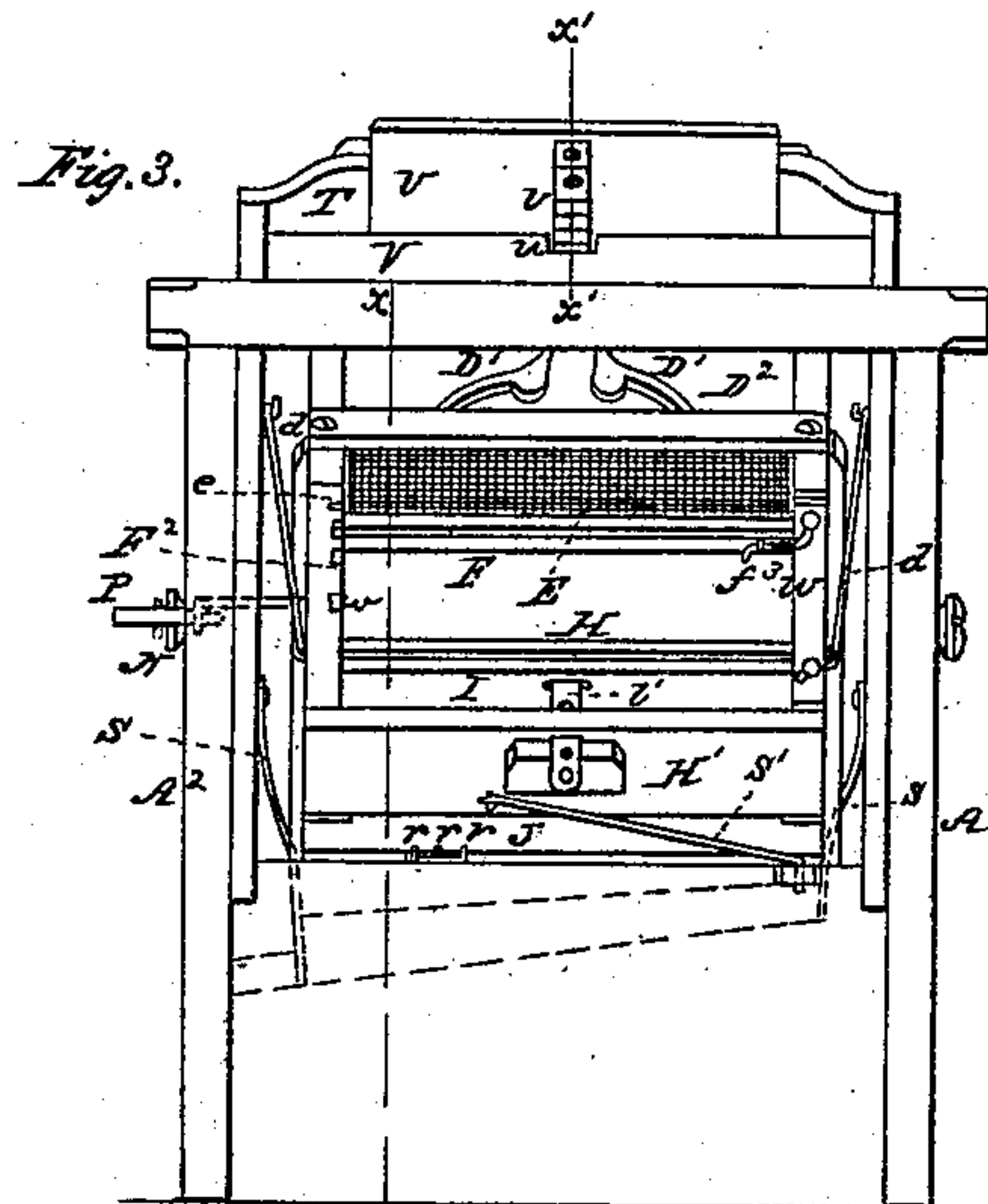
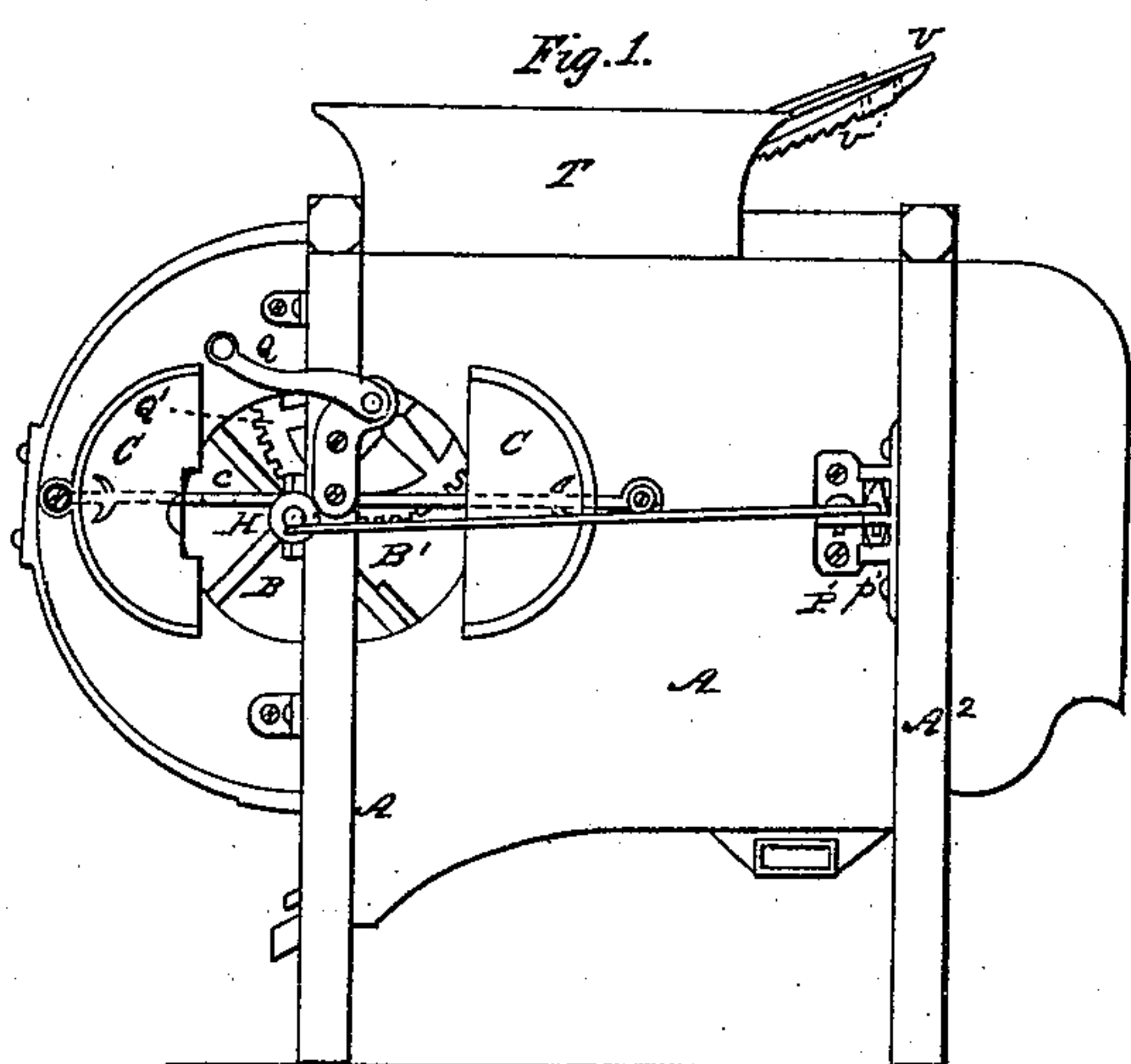


B. S. HYERS.

Grain and Seed Separator.

No. 43,693.

Patented Aug. 2, 1864.



Witnesses:
Octavius Wright
Charles Smith

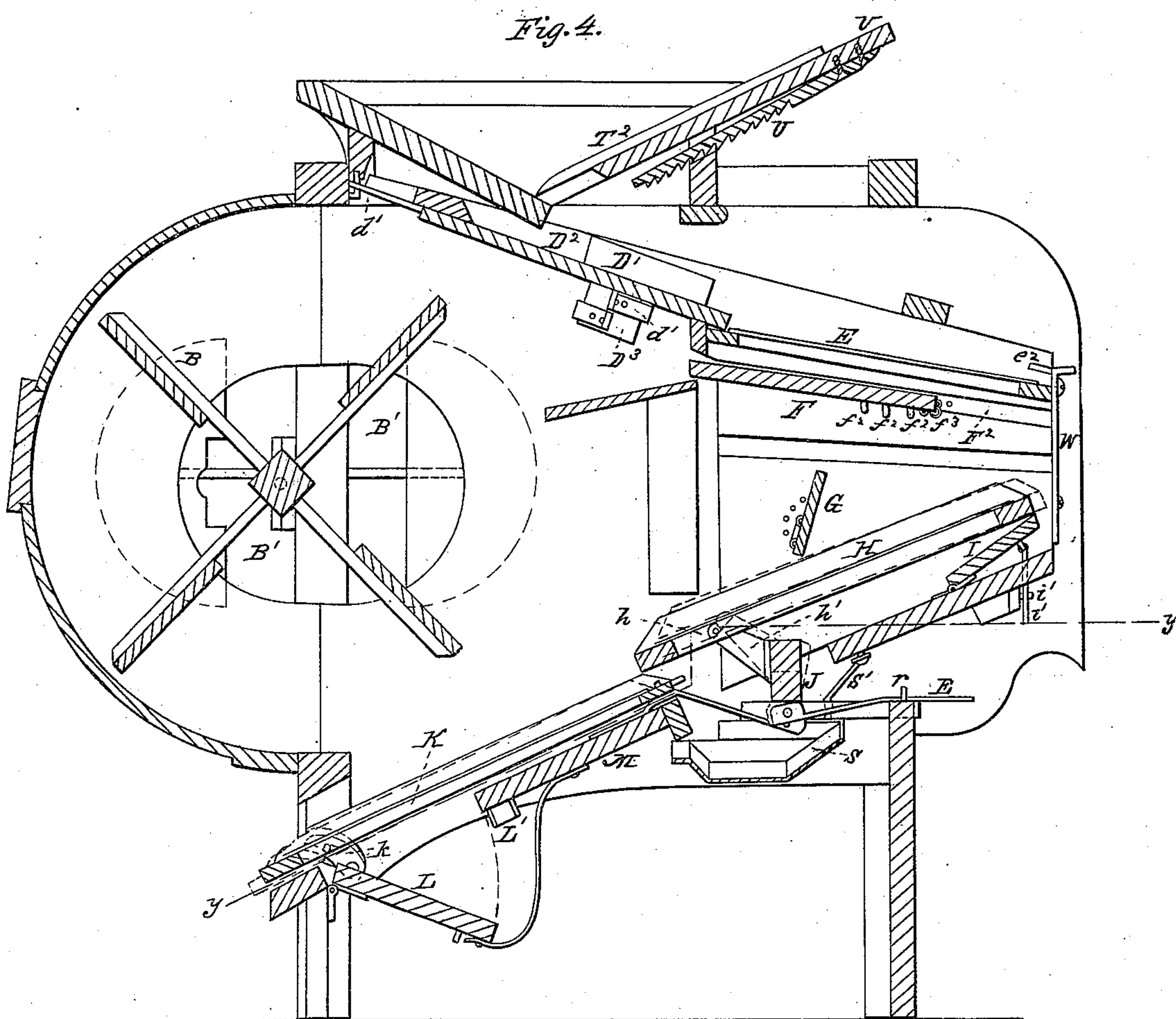
Inventor:
Benjamin S. Hyers.

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UNITED STATES PATENT OFFICE.

BENJAMIN S. HYERS, OF PEKIN, ILLINOIS.

IMPROVED GRAIN AND SEED SEPARATOR.

Specification forming part of Letters Patent No. 43,693, dated August 2, 1864.

To all whom it may concern:

Be it known that I, BENJAMIN S. HYERS, of Pekin, in the county of Tazewell and State of Illinois, have invented a certain new and Improved Grain and Seed Separator; and I do hereby declare the following to be a full and exact description of the same, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a side elevation of my improved separator. Fig. 2 is a plan or top view of the same. Fig. 3 is an end elevation. Fig. 4 is a vertical longitudinal section on a larger scale, taken in the line $x x x' x'$, Fig. 3, illustrating more clearly the interior construction of the machine. Fig. 5 is a plan of the shoe. Fig. 6 is a vertical longitudinal section of the same. Fig. 7 is a horizontal section in the line $y y$, Fig. 4. Fig. 8 is a detached view illustrating in perspective one of the riddles to be hereinafter described. Fig. 9 is a detached view exhibiting the manner in which the position of the chess-board hereinafter referred to may be modified.

Similar letters of reference indicate corresponding parts in the several figures.

The principal object of this invention is to produce an apparatus by means of which grain may be expeditiously and effectually cleansed and the several kinds of grain and seed separated.

Another object is to divest the mechanism of complication, which, as is well known, has constituted a serious impediment in the employment of machines of this character as hitherto constructed.

In order that others skilled in the art to which my invention appertains may be enabled to fully understand and use the same, I will proceed to describe its construction and operation.

In the accompanying drawings, $A A' A^2$ represent various portions of a frame which supports the several operating parts of the machine.

B represents a fan, to the action of which air may be supplied through the openings $B' B'$.

$C C$ represent adjustable shutters mounted on a rod, c , which passes through corresponding apertures in the shutters, and on this rod the said shutters are adapted to be slid to any desired positions with relation to each

other and to the openings $B' B'$, for the purpose of increasing or diminishing the quantity of air admitted to the fan casing while the machine is in operation.

D represents a shoe, which is supported within the main frame by rods $d d$, and a hook or pin, d' , the connections being made to form universal joints, so as to admit of the shaking movement of the shoe.

$D' D'$ represent pivoted legs, constituting distributors, which are mounted upon the platform D^2 , and employed to cause the grain to pass onto the riddle E in equal proportions, or to accelerate or retard the flow of grain, as the character and condition thereof may render needful. The pivots of the distributors $D' D'$ consist of short shafts D^3 , around which passes a belt, d , in order that the simultaneous adjustment of the distributors may be effected by the manipulation of one alone; or, in other words, to cause the movement of either of the distributors to produce a corresponding change in the position of the other. The connection between the shafts D^3 to effect this simultaneous motion may be made in the way described or by oblique crossed rods attached at their ends to the respective shafts, as illustrated by blue lines in Fig. 5, or in any other suitable manner.

The construction of the riddle E is more clearly shown by Fig. 8.

$E' E'$ represent strips, which are pivoted to the sides of the riddle E , and adapted to be connected thereto in parallel positions when desired by pins e , which enter corresponding apertures e' in the strips E' ; and said riddle is designed to be supported by the strips E' , the latter fitting within corresponding grooves formed in the upper part of the shoe D . The object in thus constructing the riddle E is to provide means for varying the inclination thereof, suitable notches, e^2 , being provided for the reception of the pins e when the riddle E is elevated above the strips E' . If it be desired to adjust the riddle below the strips, the pins may rest in grooves w or in notches similar to those above.

F represents a chess-board located beneath and inclined in a similar manner to the riddle E , and also provided with strips $F' F'$ and pins and apertures $f f'$. Notches $f^2 f^2 f^2$, Fig. 4, are provided, in which said pins may rest when supporting the board F at various in-

elinations. A sliding bolt, f^3 , may serve to retain the chess-board F in any desired situation when said board is adjusted to the strips F' in parallel position with the grooves F^2 , which said strips occupy. W represents a slotted bar adapted to be adjusted in proper position to retain the riddle E in place, or to be moved to the side to permit the same to be withdrawn.

G represents a transverse board, which may be adjusted at any suitable inclination in order to deflect the fan-blast in any required direction, and thereby cause it to act with greater or less effect upon the grain as it passes off the chess-board F, this being the point in the operation of the machine at which it is designed to separate the dust from the grain.

H represents a screen, upon which the grain passes from the chess board F and riddle E. The rear end of this screen H rests upon a hinged board, I, by which said end may be elevated to any required height, and the screen may be retained in such elevated position by a perforated link, i , which hooks over a pin, i' . The screen H is supported at front by means of suitable pins h , projecting from either side thereof, and each of these pins rests in a notch formed for its reception in short arms $h' h'$, which are rigidly attached to the rock-shaft J, whereby a reciprocatory, vertical, and longitudinal motion is imparted to the screen H.

K represents a second screen, over the rear end of which the front of the screen H slightly projects, so as to deposit the seed whose coarseness has prevented its passage through the latter upon said screen K. The screen K is reciprocated by the rock-shaft J through the medium of a forked link or rod, k , and the metallic slotted arms $k' k'$, by which the screen K is supported at front, are loosely pivoted to the main frame, so as to conform to the reciprocation of said screen.

L represents a door, which, when open, permits the discharge of the seed which passes through the screen K and onto the grain-board M. The door L may be held in a closed position by a button, L' , Fig. 4, which button is also shown in dotted outline in Fig. 7.

N represents a metallic disk, keyed upon one end of the fan shaft, and provided with an aperture for the reception of a connecting-rod, O, which imparts a vibratory motion to a bell-crank, P, by which the requisite shaking movement is given the shoe D through the medium of a rod, p .

The bell-crank P is journaled in boxes p' p' , attached to the upright A^2 of the main frame. Q represents a crank-handle, by the rotation of which motion may be imparted to both the fan and shoe, said handle being secured upon a short shaft, q , upon the inner end of which is keyed a gear-wheel, Q' , meshing with a suitable pinion on the fan-shaft. $p^2 p^2$ represent a series of apertures for the adjustment of the rod O, in order to vary the motion of the shoe D, as may be required. The rock-shaft J is put in motion or rocked

by a pivoted rod or bar, R, one end of which may be hooked over either of a series of pins, $r r r$, which admit of the adjustment of the movable end of the bar R, to effect an increase or diminution in the speed at which the shaft rocks, for the purpose of producing a corresponding variation in the motion of the screens H and K independently of the rate at which shoe D is being shaken.

S represents a trough or spout suspended from the main frame by hangers $s s$, and shaken at a velocity more or less in excess of that of the shoe by a rod, S' , which is attached at its respective ends to the under side of the grain-board H' , beneath the screen H, and to a pivoted bar, s' , the latter being fulcrumed at s^2 , and attached at the trough S, at its opposite end, by means of a suitable pivot.

It will be apparent that, by reason of the power being applied to the bar s' at a point between its fulcrum and the end from which motion is communicated to the trough, the said trough will be moved to a greater extent than the shoe. The bar s' is provided with a series of apertures, s^3 , in which the rod S' may be adjusted, in order to increase or diminish the extent of the movement imparted to the trough S.

T represents a hopper provided with a sliding gate, U, for regulating the flow of grain upon the platform D^2 .

T^2 are strips, which may be attached to either the gate or hopper and completely close the joints between the sides of the gate U and the adjacent portions of the hopper, and these strips, in combination with the transverse bar V, serve also to retain the gate in proper position without the addition of any ledges or strips placed beneath and extending lengthwise of the joints referred to.

U' is a toothed bar or catch which rests and moves within a slot, u , and is attached to the under side of the gate U in such manner that when the latter is elevated or opened to permit the passage of the seed or grain, the teeth of said bar will take over a small bar, u' , in the slot u , and thereby retain the gate U in any position in which it may be placed. The bar U' admits of being pressed upward, so as to permit the gate to be lowered when it is desired to diminish the flow of seed.

Operation: The gate U being opened to the requisite extent, the mixture of grain, together with the other matter which may be mixed with the same, is poured into the hopper T, whence it flows onto the platform D^2 , where, by the legs $D' D'$, it is distributed in the requisite proportions, preparatory to passing onto the riddle E. The openings or perforations in the sieve of the riddle E are designed to be just large enough to permit the passage of the wheat and smaller seed, such as timothy and clover, but at the same time too small for unthrashed heads, whitecaps, &c., so that when the shoe is put in motion by the handle Q the wheat and small seed will be shaken through the riddle E, and the imperfectly-

thrashed grain and any lumps of dirt which may be interspersed among the wheat will pass off the lower end of the riddle E in a separate body. The wheat and small seed which pass through the screen E fall onto the inclined chess-board F, which is arranged in such manner with relation to the screen H that the wheat, &c., will be caused to fall onto the latter at a point near the upper rear end thereof, so as to allow the whole body to be subjected to the sifting process while traversing the entire length of said screen H, the seive in which is designed to be of such texture as will admit of the passage of grass or other small seeds only, and the latter, having passed through the screen H, are received on the grain board H', and are thereby conducted into the shaking inclined trough S, at the mouth of which may be placed a suitable vessel for their reception, if desired. The body of grain, &c., in passing from the chess-board F, is acted upon by the blast from the fan B, and the chaff, dust, and other light matter are caught thereby, separated from the wheat, &c., and expelled at the rear end of the machine. The wheat, together with such other heavy matter as cannot pass through the screen H, flows from it onto the screen K, through which the imperfect wheat, chess, clover, cockle, or other matter, known as "screenings," may pass and be received onto the grain-board M, whence it is discharged at the door L, the good wheat in the mean time passing off the screen K and out at the main delivery at the front of the machine. The screen K, besides the reciprocatory motion imparted to it by the rock shaft J, has its front end elevated and depressed in such manner that at every alternate movement of the said screen its lower or front end is jarred, in order to more effectually prevent the grain from remaining in the meshes of the sieve, and a like notion is imparted to the upper screen, H, by the arms *h h*. The screens H and K are reciprocated simultaneously in opposite directions by the rock-shaft J, which, it will be seen, adapts the machine to be operated with less power. The grooves *w* may also serve to support an additional riddle should the nature of the work render it necessary.

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

1. Mounting the sliding shutters C C on one more horizontal rods *c*, of metal or wood, passed through apertures in the said shutters in the manner shown and described.

2. The pivoted distributors D' D', adjustable simultaneously in corresponding positions, substantially as described.

3. The combination of the hinged board I, link *i*, and pin *i'*, employed in the manner described, to support the rear end of the screen H at any desired height.

4. The combination of the two screens H K, moved simultaneously in opposite directions by means of the rock-shaft J, arms *h' h'*, and link *k*, substantially as specified.

5. The combination of the series of pins *r r* and adjustable rod or bar R with the rock-shaft J, and screens H K, for the purpose of varying the motion of the said screens without changing the motion of the shoe.

6. The spout S, suspended from the stationary frame by hangers *s s*, and receiving a shaking motion in excess of that of the screen by means of the rod S' and pivoted bar *s'*, or their equivalents.

7. The combination of the hinged discharge-door L and button L', arranged in the described relation to the grain-board M and screens H K, for the purpose specified.

8. The toothed catch U', applied to the gate U in the manner shown and described, so as to support the said gate at any desired height, or by pressing it upward against the gate to permit the closing of the latter.

9. The strips T², applied as described above the joints between the hopper T and gate U, in combination with the transverse bar V, without necessitating the use of supporting-strips extending lengthwise of and beneath the said joints.

10. The notches *f² f² f²*, formed in the sides of the shoe D at right angles to and communicating with the grooves F² therein, for the purpose of receiving the pins *e* or *f*, projecting from the edge of a chess-board or riddle, and permitting the rear end of the latter to be adjusted upward or downward in relation to the pivoted strips.

BENJAMIN S. HYERS.

Witnesses:

CHARLES DUBOIS,
CHARLES D. SMITH.