

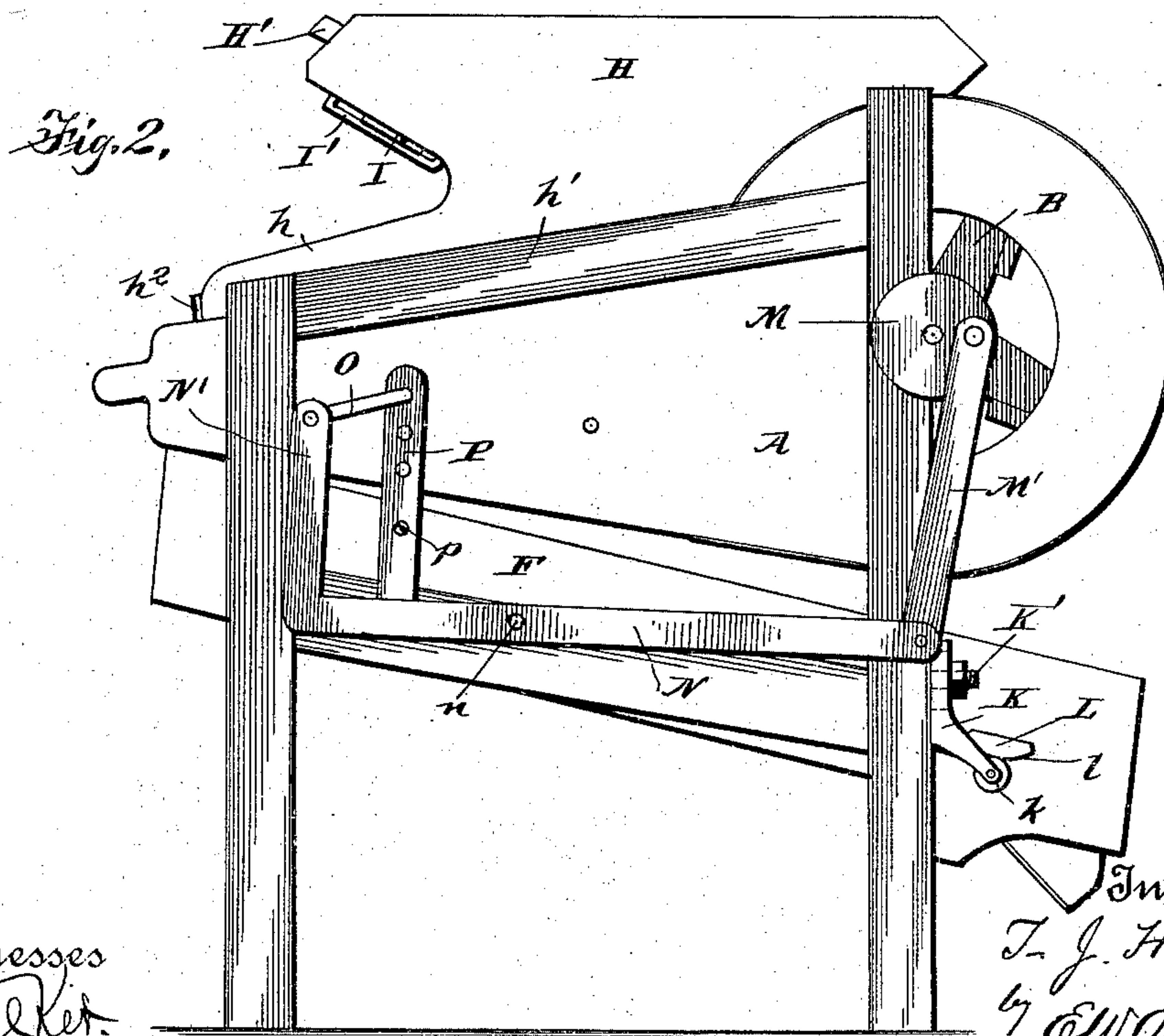
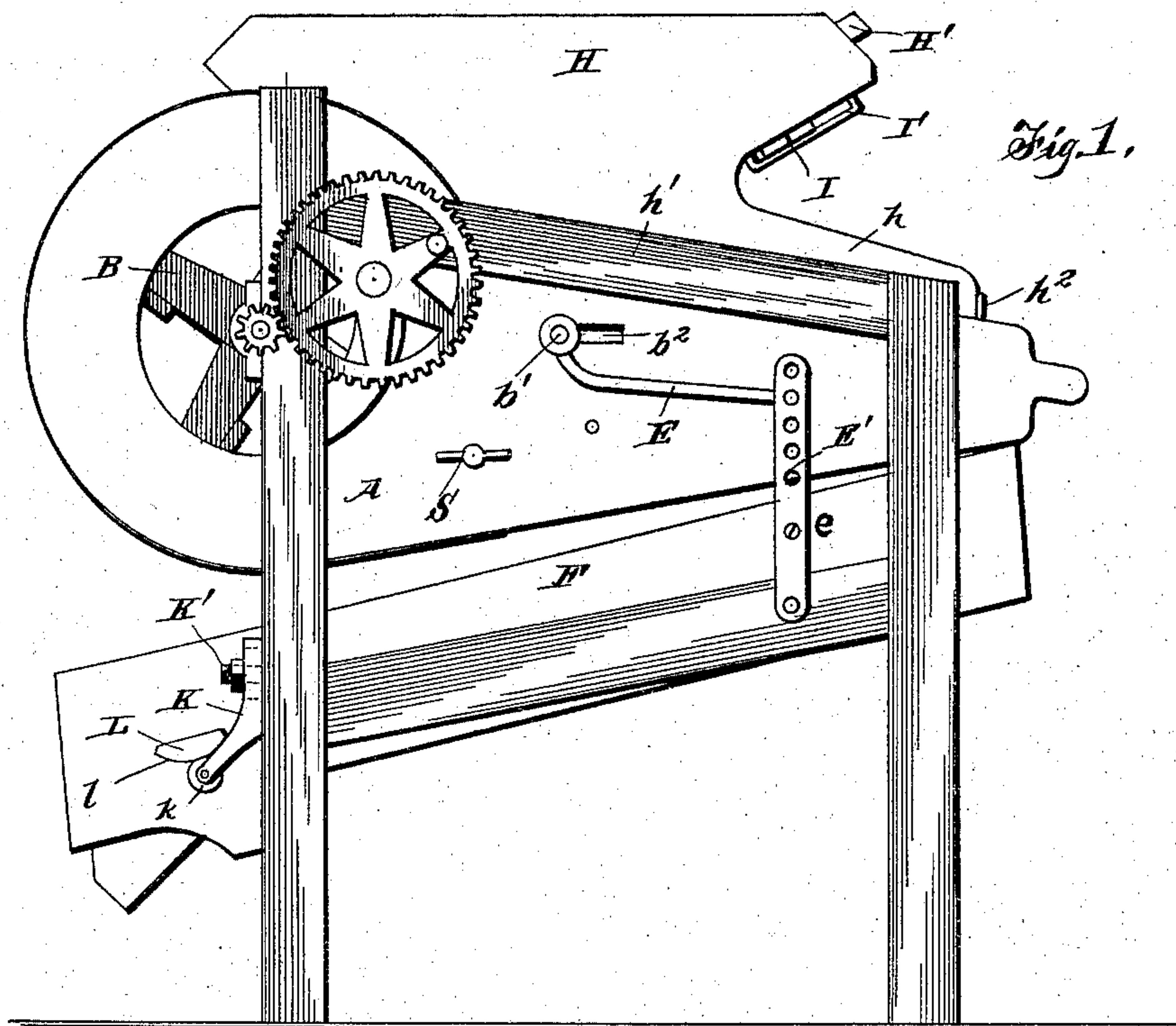
(No Model.)

3 Sheets—Sheet 1.

T. J. HATFIELD.  
GRAIN CLEANER.

No. 477,594.

Patented June 21, 1892.



Witnesses  
Samuel K. ...  
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his Attorney

(No Model.)

3 Sheets—Sheet 2.

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Fig. 3.

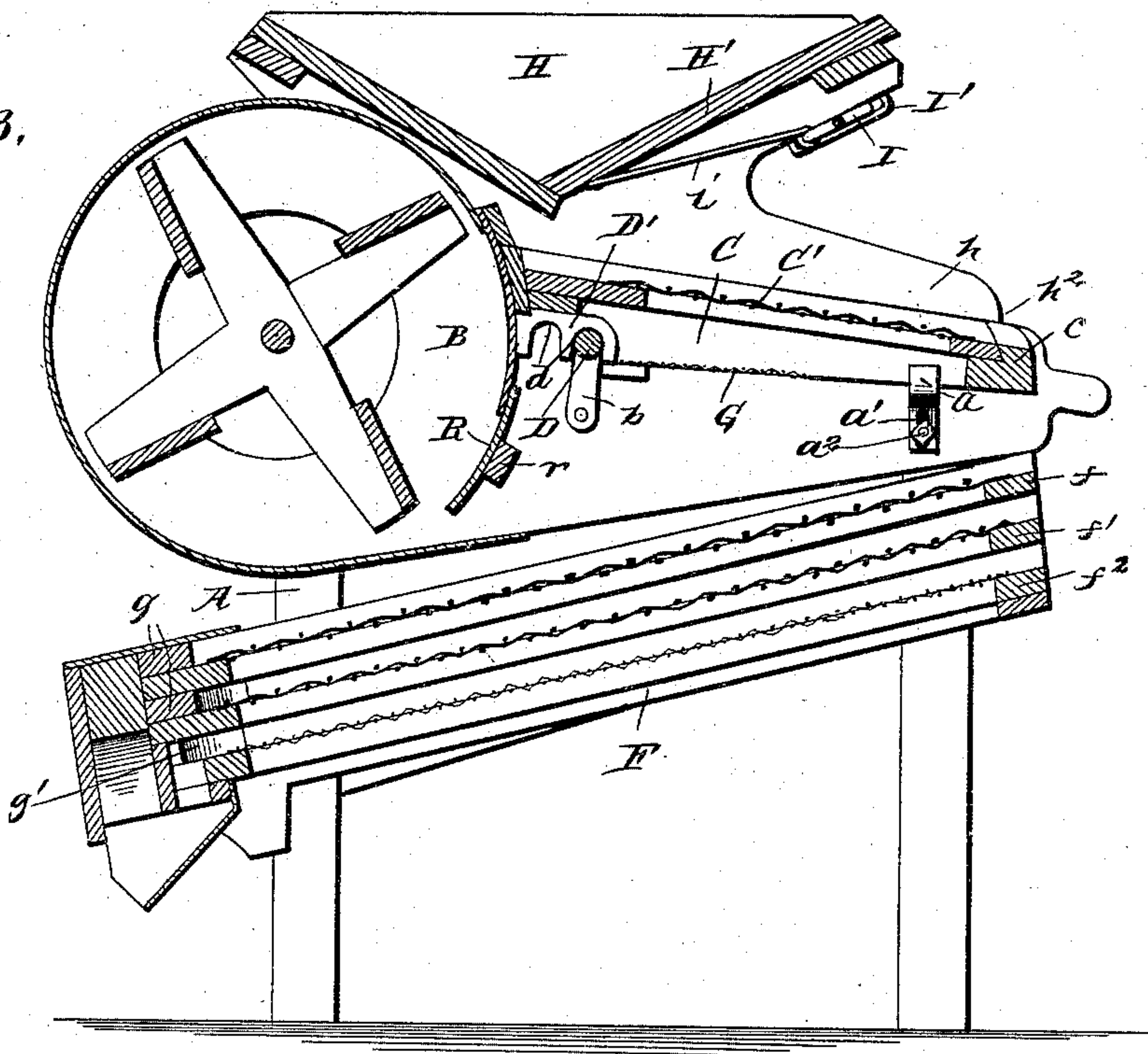
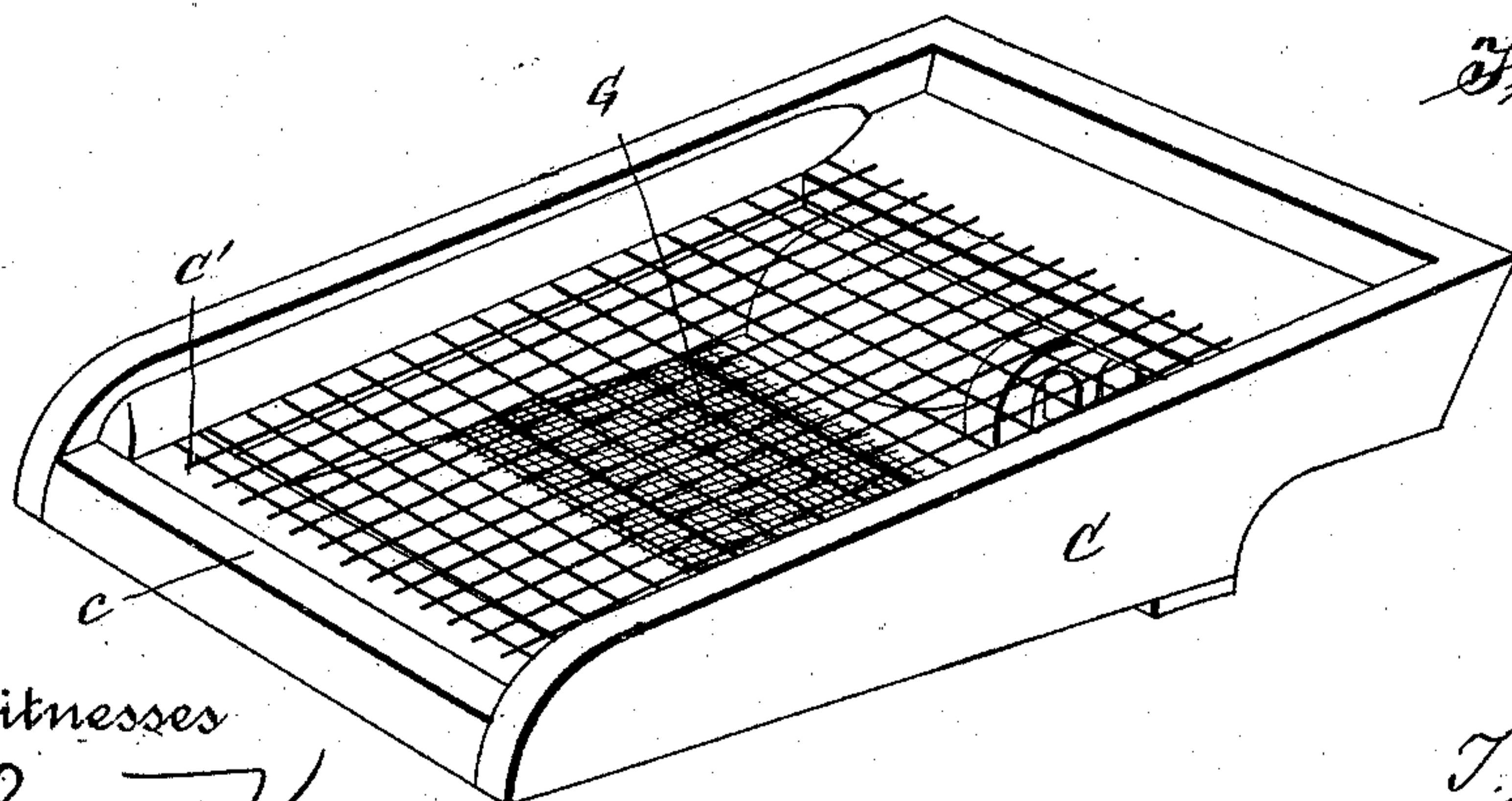


Fig. 4.



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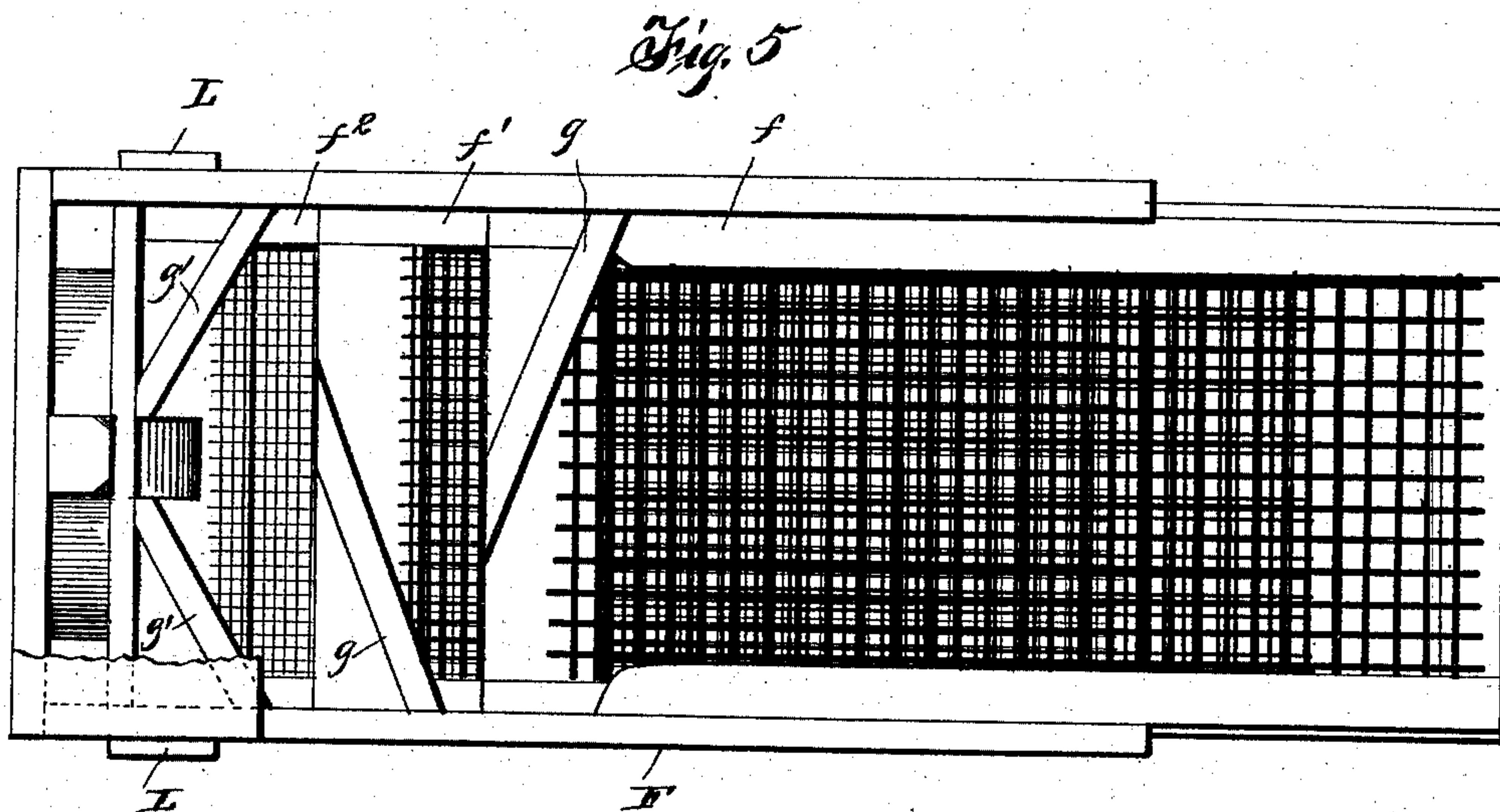
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3 Sheets—Sheet 3.

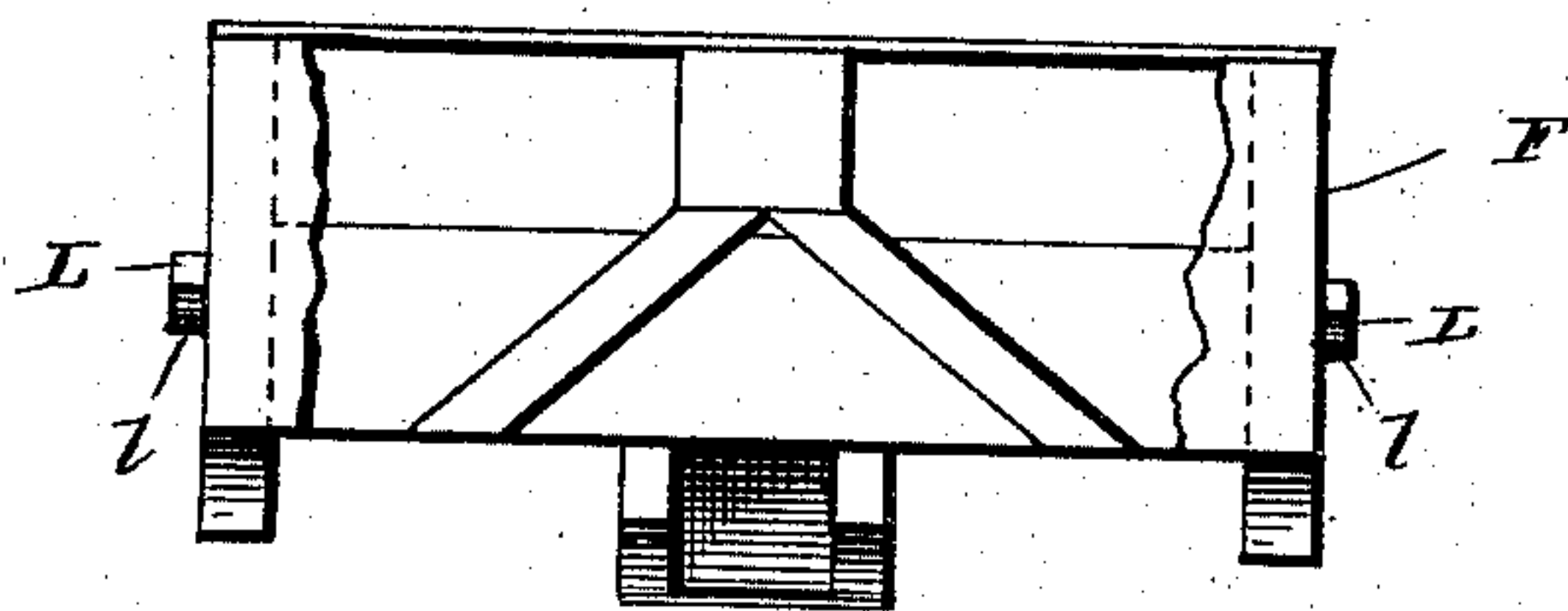
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*Fig. 6.*



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# UNITED STATES PATENT OFFICE.

THOMAS J. HATFIELD, OF DUBLIN, INDIANA, ASSIGNOR OF ONE-HALF TO  
J. C. BENSON, OF ALCONY, OHIO.

## GRAIN-CLEANER.

SPECIFICATION forming part of Letters Patent No. 477,594, dated June 21, 1892.

Application filed October 31, 1891. Serial No. 410,493. (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS J. HATFIELD, a citizen of the United States, and a resident of Dublin, in the county of Wayne and State of Indiana, have invented certain new and useful Improvements in Grain-Cleaners; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

Figure 1 of the drawings is an elevation showing one side. Fig. 2 is an elevation of the opposite side of Fig. 1. Fig. 3 is a vertical longitudinal section. Fig. 4 is a perspective view of chaff-shoe. Fig. 5 is a top plan view of bottom shoe with screens partially removed, and Fig. 6 is an end view of bottom shoe.

This invention has relation to certain new and useful improvements in grain-cleaners; and it consists in the novel construction and combination of parts, as hereinafter specified and claimed.

In the accompanying drawings, the letter A designates the frame or casing of the machine.

B is the blast-fan, having the usual curved casing and driven by a crank-gear and pinion, as shown, or by other suitable means.

C is the upper shake or chaff shoe, in which is removably held a chaff screen or riddle C'. This screen is shown as designed to be removed by a vertical instead of a longitudinal movement and is held in place by the end piece c of the shoe. The lower or rear end of this shoe is supported in the side brackets a of the frame. These brackets are made vertically adjustable by a slot a' and a set-screw a<sup>2</sup> to provide for the vertical adjustment of the lower end of the shoe. The forward end of the shoe is supported on a transverse vibratory bar or shaft D by means of a bearing-block D' on the shoe, having therein a series of bearings d. The object of this adjustability is to render the shoe adapted to different kinds and qualities of grain requiring a greater or less degree of inclination of the

shoe to cause it to pass through the screen at the proper rate. The shaft D has at each end a downwardly-projecting lug or arm b, which is pivotally secured to the inner face of the sides of the casing. At one end said shaft has also a stud or pin b', which projects through an oblong slot b<sup>2</sup> in the frame and has connected therewith a rod or link E, which at its opposite end is connected to any one of a series of apertures in a pivoted arm or lever E', connected to a lug e on one side of the lower shoe F, so that as the latter shoe is vibrated reciprocally, as hereinafter described, a vibratory movement will be imparted to the shoe C, and this movement may be varied by the point at which the rod or link E is connected to the arm or lever E' and the point at which said shoe is supported on the shaft D.

Below the front portion of the riddle C' the shoe C has secured thereto a grain-board G, which is preferably of wire screen of a mesh sufficiently fine to prevent the passage thereof of grain or fine seed, but at the same time permitting the passage of air. This board is for the purpose of carrying the grain to and discharging it over the rear end of the lower shoe, in order that it may receive the full benefit of the screens therein. By the manner in which the shoe C is supported, as shown and above described, it may be removed from the frame at any time without necessitating the removal of any rods, bolts, or screws.

H represents the hopper, supported at its forward end upon the cylindrical blast-wheel casing, and at its rear ends having the side arms h, which rest on the upper edge of the side portions of the frame on either side of the shoe and which are held in place by strips h' of the frame. The hopper is held from sliding off the rear of the machine by the stops h<sup>2</sup>, which are engaged by the ends of the arms h.

H' is the adjustable slide for the hopper, working in grooves in the sides thereof. To one of the arms h is pivoted one end of a rod I, which at its center has a connection i with said slide, its opposite end being held in a keeper I'. By the operation of this rod said slide may be raised or lowered to permit the adjustment for the desired feed. The hopper H may at any time be lifted off and removed



when it is desired to clean the machine or for convenience in transportation.

In the lower shoe F is a series of graded removable screens or riddles  $f$ ,  $f'$ , and  $f^2$ . The screens  $f$  and  $f'$  are provided at their discharge ends with a deflector-strip  $g$ , so arranged that the said screens will discharge at opposite sides. The lower screen  $f^2$  has double deflector-strips  $g'$ , by means of which said screen is caused to discharge at the center. The screen  $f$  separates the first grade, the screen  $f'$  the second grade, cheat, and cockle-seed, and screen  $f^2$  the clover-seed. Any finer seed, as timothy, will fall through screen  $f^2$ , so that each class of seed is separated and discharged by itself at one operation. The lower or discharge end of the shoe F is supported by hangers K, one on each forward end post of the frame. Said hangers at their lower ends carry each an anti-friction roller  $k$ , upon which rest and travel the curved or cam surfaces  $l$  of blocks or lugs L, secured to either side of the shoe.

On one end of the blast-wheel shaft is a disk M, having a wrist-and-pitman connection M' with a longitudinal bar or lever N, pivoted beyond its center to one side of the frame at  $n$ . The opposite end has a vertical arm N', which is connected by a rod or link O to a vertical lever P, pivoted at its lower end to the frame and at its intermediate portion to a lug or projection  $p$  on the shoe F. It will be seen, through the above connection, that when the blast-wheel is turned a vibratory reciprocating movement will be imparted to the shoe F, and thereby to the shoe C.

By means of the cam-blocks L, which travel on the rollers  $k$ , a vertically-oscillating movement will also be imparted to the shoe F. The hangers K are each secured in place by a set-screw K', which passes through an oblong slot therein, thereby providing for the vertical adjustment of the lower end of the shoe F, according to the character of the grain it is desired to clean.

The blast from the wheel B is arranged to enter the machine between the upper and lower shoes, and at this point I provide a wind-board R, hung on a rod or shaft  $r$ , projecting through the frame at one end and provided thereat with an adjusting-screw S. By means of this board a direct blast may be applied in a straight line, or by setting the board at an angle the blast is deflected up and down, which is more effective, as the upward blast more thoroughly removes the chaff while the downward blast more effectually

removes the finer particles of dirt and foreign matter.

The ease and convenience with which the hopper, chaff-shoe, and screens may be removed, owing to the construction and arrangement above described, is an important feature of the invention, as is also the adjustability of the shoes and the means for changing their vibratory movement for different qualities of grain.

Each of the screens  $f$ ,  $f'$ , and  $f^2$ , being different, if removed for any purpose, cannot be placed back in the machine otherwise than in correct position, this doing away with the difficulty experienced in following instructions for the correct arrangement of screens by any one unfamiliar with the use of such devices.

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

1. In a grain-cleaner, an endwise and vertically adjustable upper shoe having a vertically-removable screen C' and a fine-mesh wire grain-board secured thereto and located under the upper portion of said screen, substantially as specified.

2. The lower shoe having the series of graded screens therein and the independent discharges therefor, the lower end of said shoe having the convex bearing-blocks, one at each side, and the hangers adjustably secured to the frame and carrying each an anti-friction roller, on which the said bearing-blocks are respectively supported, substantially as specified.

3. In a grain-cleaner, the combination, with the upper and lower shoes, of the mechanism for imparting a vibrating and reciprocating movement thereto, said mechanism comprising the disk M on the fan-shaft, its wrist and pitman M', the longitudinal eccentrically-pivoted bar or lever N, having a vertical arm N', a vertical lever P, pivoted at its lower end to the frame and at its intermediate portion to the lower shoe and connected by a link to the said arm N', and a vibrating connection between the opposite side of said shoe and a transverse loose shaft upon which one end of the upper shoe is supported, substantially as specified.

In testimony whereof I affix my signature in presence of two witnesses.

THOMAS J. HATFIELD.

Witnesses:

E. MCNAMEE,  
H. H. JOHN.