

No. 668,851.

Patented Feb. 26, 1901.

D. FRANCE.
FLAX SEPARATOR.

(No Model.)

(Application filed Aug. 28, 1899.)

2 Sheets—Sheet 1.

Fig. 1.

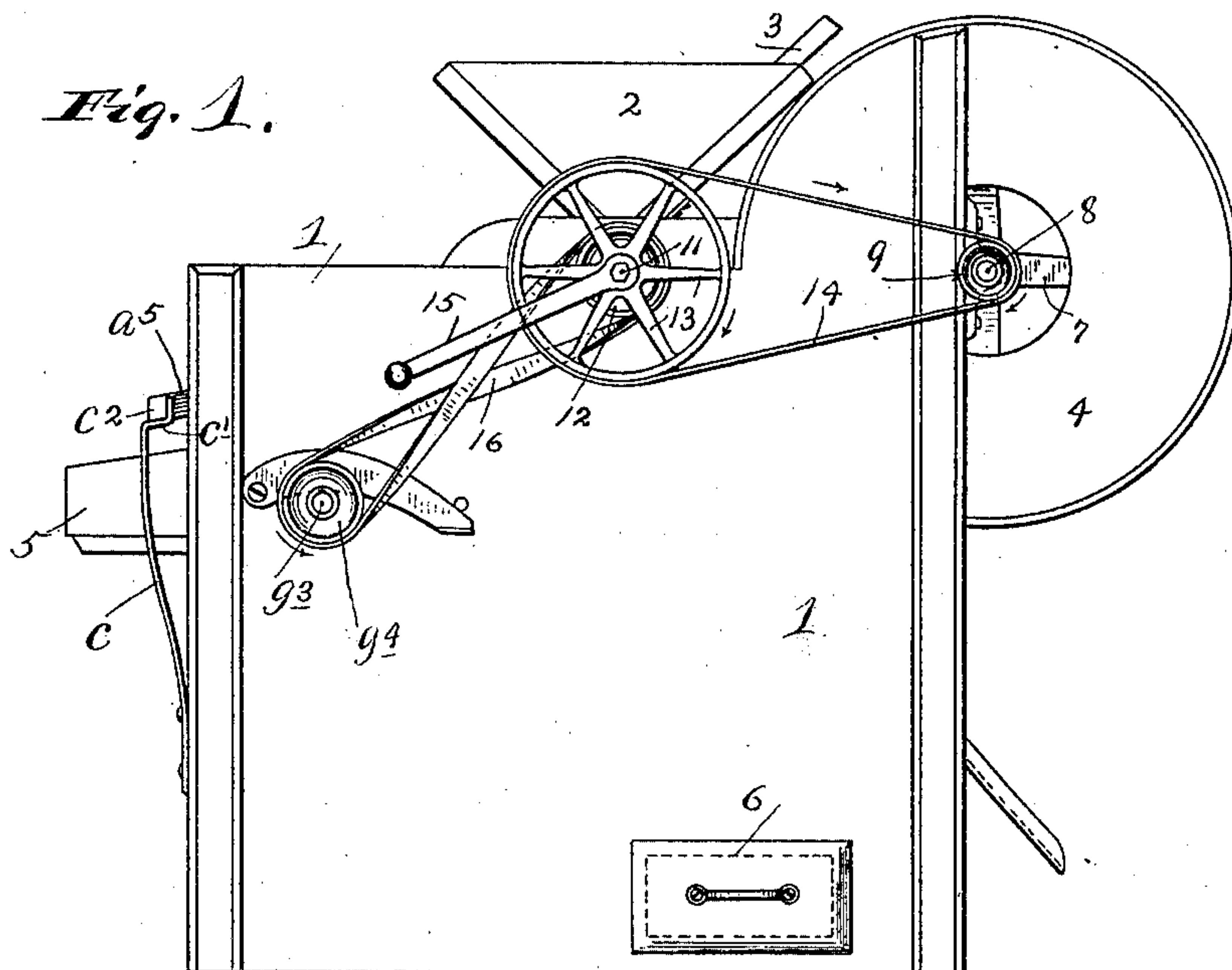
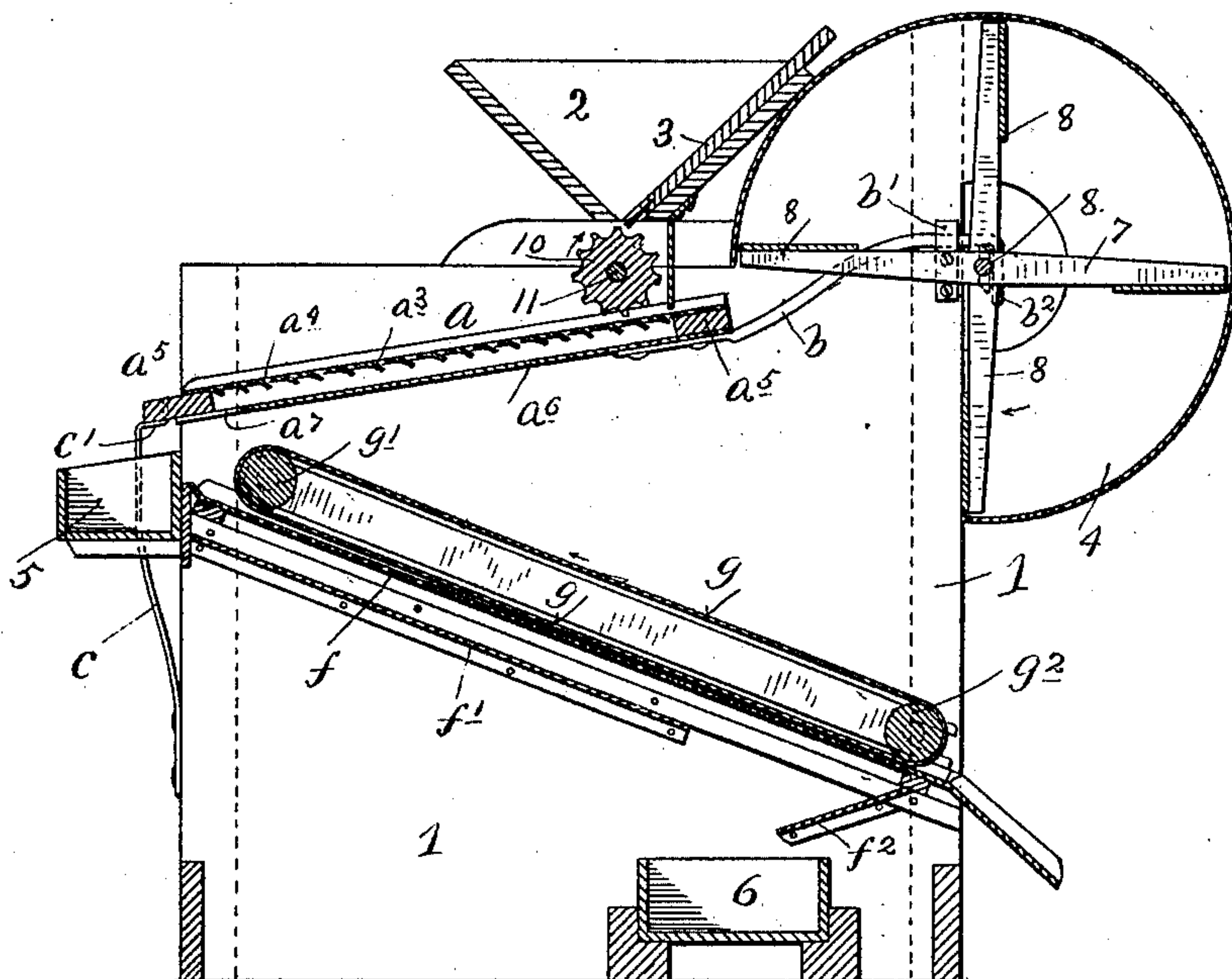


Fig. 2.



Witnesses.

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UNITED STATES PATENT OFFICE.

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FLAX-SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 668,851, dated February 26, 1901.

Application filed August 28, 1899. Serial No. 728,662. (No model.)

To all whom it may concern:

Be it known that I, DAVID FRANCE, a citizen of the United States, residing at Hawley, in the county of Clay and State of Minnesota, have invented certain new and useful Improvements in Flax-Separators; and I do hereby 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.

My invention has for its object to provide an improved grain-separator especially adapted to separate flaxseed from other grains and foreign materials with which it is mixed.

To the above ends my invention consists of the novel devices and combinations of devices hereinafter described, and defined in the claims.

The invention is illustrated in the accompanying drawings, wherein like characters indicate like parts throughout the several views.

Figure 1 is a view in side elevation showing my improved flax-separator. Fig. 2 is a vertical longitudinal section taken centrally through the separator. Fig. 3 is an enlarged view of a portion of the machine, some parts being broken away and others removed, said view corresponding to Fig. 1 in the direction in which it is viewed. Fig. 4 is a plan view of the vibrating screen or sieve, and Fig. 5 is a vertical section taken on the line $x^5 x^5$ of Fig. 4.

The numeral 1 indicates the case or frame of the machine, which in the illustration given is provided with a hopper 2, with adjustable feed-board 3, a fan-case 4, secured adjacent to said hopper 2, a catch-trough 5, secured at one of the case 1, and a catch box or trough 6, which, as shown, is in the form of a removable drawer, supported at the bottom of the case 1. Working within the fan-case 4 is a suitable fan 7, the shaft 8 of which projects at one end and is provided with the pulley 9.

Immediately below the opening in the bottom of the feed-hopper 2 is mounted a feed-roller 10, the shaft 11 of which has suitable bearings in the sides of the frame 1 and projects at one end and is provided at this projecting end with a pair of pulleys 12 and 13, the latter of which stands in line with the pulley 9 of the fan-shaft 8. A belt 14 runs

over the said pulleys 9 and 13. This being a hand-machine, the shaft 11 is provided with a hand-crank 15, by means of which the machine may be driven:

Below the feed-roller 10 a vibrating screen or sieve (indicated as an entirety by the letter a) is mounted. This screen a is formed from a thin sheet or plate of metal, which has a plurality of perforations or meshes, formed by cutting slits a' at a right angle to the direction in which the sieve is to be vibrated. These slits a' have short slit extensions a^2 , that extend longitudinally of the screen or at right angles to the main slits a' . In this manner rectangular tongues a^3 are formed, and these tongue portions are depressed or bent downward, as best shown in Figs. 4 and 5, thereby leaving slots or perforations a^4 , that extend at a right angle to the direction in which the sieve is to be vibrated, and have parallel edges—that is, the slots or perforations a^4 have the same width at all points transversely of the sieve. When the screen a is supported in an inclined position, as indicated in Fig. 2, the upper and the depressed edges of the slots a^4 will overlap, so that no truly vertical passages are left or formed in the screen when in position for operation.

As illustrated, the screen a is secured to a frame a^5 , and to this frame, immediately under said screen, is secured an imperforate deck a^6 , which is terminated short of the lower end of the frame a^5 , so as to leave a discharge-opening a^7 . At its upper and inner end the frame a^5 is supported by a pair of brackets b , the projected ends of which work in keepers b' on the frame 1 and are provided with downturned fingers b^2 , that are adapted to be struck by cam lugs or projections b^3 , carried by the fan-shaft 8. The brackets or arms b are adapted to spring, the same being especially adapted to yield at their reduced ends, where they join or are connected to the frame a^5 . At its forward end the said sieve-frame 5 is supported by a pair of leaf-springs c , the upper ends of which are formed with offset portions c' , that engage projections c^2 of said frame a^5 . The springs c not only support the lower end of the sieve-frame a^5 , but put the said frame under spring tension to move outward or forward into one extreme position as

limited by the engagement of the fingers b^2 of the brackets b with the fan-shaft 8. The lower end of the frame a^5 overlies the catch box or trough 5, while the opening a^7 in the deck a^6 is located inward of the said trough or box.

Extending from the box 5 to the opposite end of the frame 1 and inclining reversely to the screen a is a fixed screen or sieve f , and immediately below this sieve f , but terminating short of the lower end thereof, is an inclined imperforate deck f' , the lower end of which terminates immediately above the catch box or drawer 6. As shown, the short reversely-inclined deck-section f^2 extends from the lower end of the sieve f and terminates on a line above said catch box or drawer section.

An endless belt or conveyer g works over the upper surface of the sieve f , the same being mounted to run over guide-rollers g' g^2 , which are suitably mounted in the frame 1. The shaft g^3 of the upper roller g' is provided with a pulley g^4 , which stands in line with the pulley 12 of the feed-roller shaft 11. A belt 16 runs over the pulley 12 and said pulley g^4 .

The operation will be substantially as follows: The flaxseed, mixed with other grains and foreign materials, is placed in the feed-hopper 2 and is fed therefrom in an even stream onto the vibrating sieve a by the feed-roller 10. Motion being imparted to the machine by revolving the crank 15, the fan-shaft 8 and fan 7 will of course be rotated and a blast of air will be blown through the perforations or slots in the screen a , and thereby the dust and light foreign materials will be carried off and separated from the stock. As the grain passes downward over the sieve a said screen will be vibrated with a knocking or jarring action by the engagement of the cam-lugs b^3 on the fan-shaft 8 with the depending fingers b^2 of the sieve-supporting brackets b . When the cam-lugs b^3 engage the fingers b^2 , the screen a is drawn inward or rearward, and when said lugs pass out of engagement with said fingers the springs c force the sieve a suddenly forward or outward until the fingers b strike the shaft 8. The said screen 8 is then left standing for a short interval. When the depending fingers b^2 of the spring-brackets b are thrown against the shaft 8 by the springs c , the momentum of the screen will tend to cause the said arms b to straighten slightly, and this will produce a slight vertical movement of the screen a . This slight but sudden vertical movement of the screen a serves to throw the seeds or grain out of the depressions or meshes thereof, and thus keeps the screen clean and prevents clogging of the same. By various practical tests I have found that the above action of the screen is of great importance and greatly increases the efficiency of the machine. The flaxseed being flat and very slippery will slide into the depressions caused by the pressing downward of

the lips a^3 , and by the violent or sudden forward movement of the screen a they will be forced through the slots a^4 and will fall onto the deck a^6 . The perforations above described are of a form especially adapted to pass flat seeds, such as flaxseed, and the sudden forward movements or reciprocations of the screen are necessary to cause the ready passage of the flaxseed through these slots or meshes of the screen. Hence it will be seen that there is an important relation between the screen having meshes of the character above described and the device for imparting to the screen its jarring or sudden reciprocations. The flaxseed, together with some of the very small and rounder seeds, will pass through the opening a^7 in the deck a^6 and by the endless belt or conveyer g will be forced or carried over the upper surface of the stationary sieve f , and the flaxseed, being held flat, will be carried completely over said sieve and discharged from the lower end of the same, while the small seeds will be forced through the meshes or perforations of said sieve and will be caught by the drawer or box 6. The chaff and large material will pass over the upper surface of the sieve a and will be caught in the box 5.

What I claim, and desire to secure by Letters Patent of the United States, is as follows:

1. The combination with a vibrating screen under yielding strain to move in one direction, of a rotary shaft provided with lugs or knockers, and a spring supporting-arm secured at one end to said screen and provided at its free end with a finger or offset portion, subject to the action of the said lugs or knockers of said rotary shaft, which spring supporting-arm is curved or crooked at its intermediate portion, whereby when the offset finger portion thereof is released by the said lugs or knockers it will strike said shaft as a stop, with the result that a vertical or jumping motion will be imparted to said screen, substantially as described.

2. The combination with the vibrating screen a , having meshes of the character described, of the springs c , supporting the lower end of said screen and forcing the same forward, the curved spring-brackets b , secured to the upper end of said screen, and provided with depending fingers b^2 , guides b' for the outer ends of said brackets b , and a rotary shaft provided with lugs or knockers b^3 , operating on said fingers b^2 to force the screen against the strain of the spring c and then to suddenly release said fingers, which fingers, when released, will strike the said shaft as a stop, with the result that a vertical or jumping motion will be imparted to the said screen, substantially as described.

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

DAVID FRANCE.

Witnesses:

GEORGE MAHON,
JOHN MAHON.