

(No Model.)

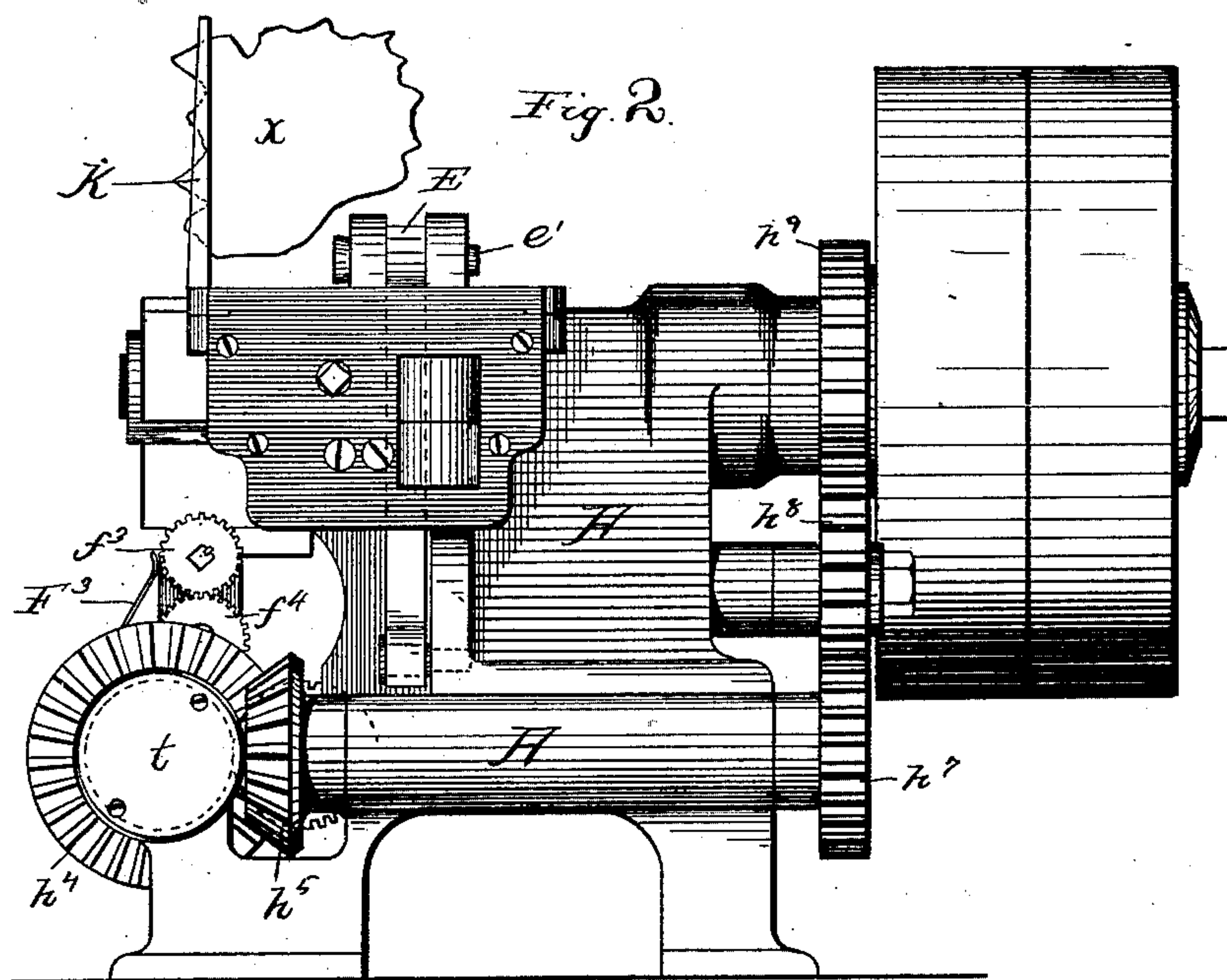
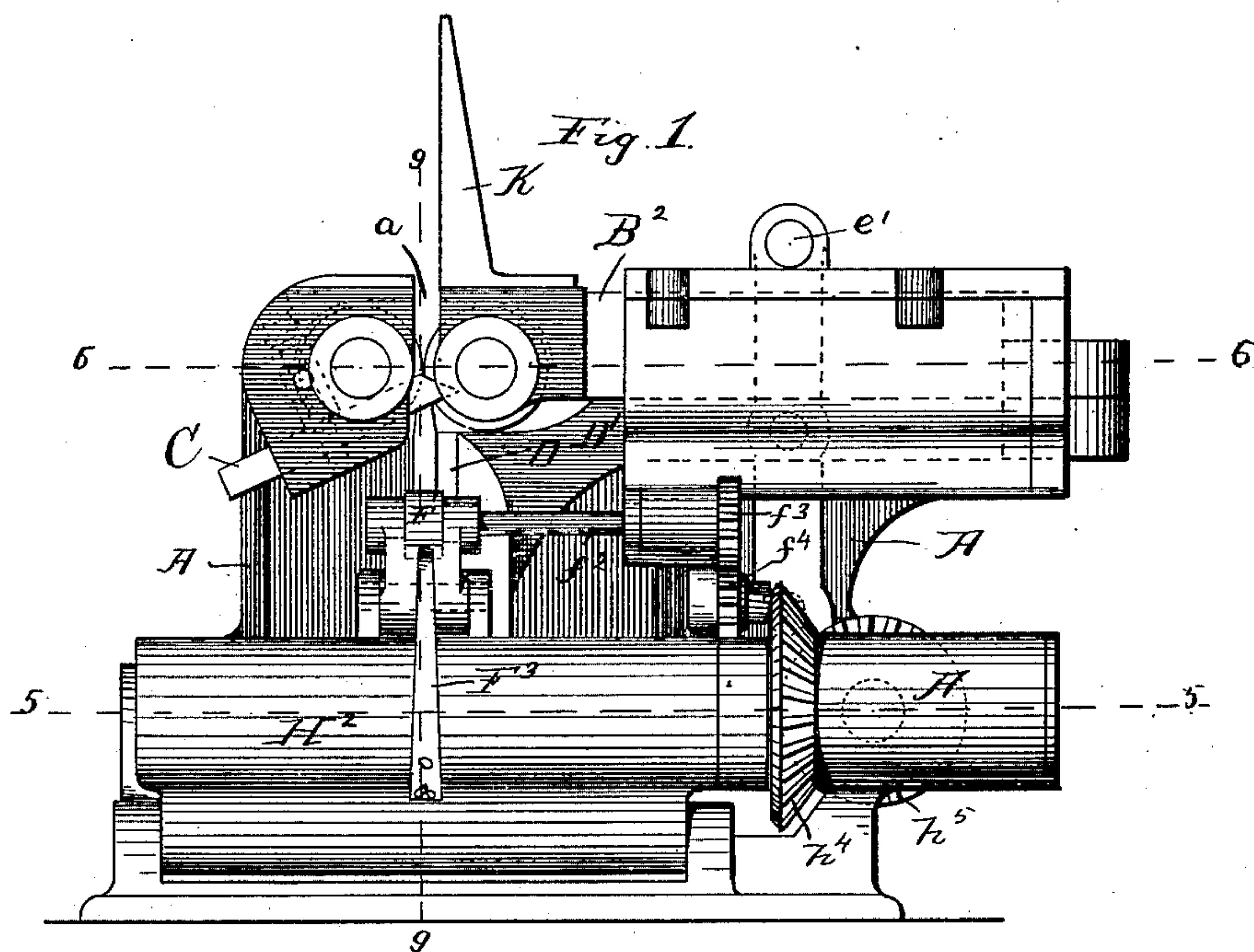
4 Sheets—Sheet 1.

C. E. ROBERTS.

LEATHER SCRAP SPLITTING MACHINE.

No. 358,883.

Patented Mar. 8, 1887.



Witnesses:

Sen. C. Curtis.

H. M. Munday.

Inventor:

Charles E. Roberts.

By Munday, Everts & Adcock
his Attorneys.

(No Model.)

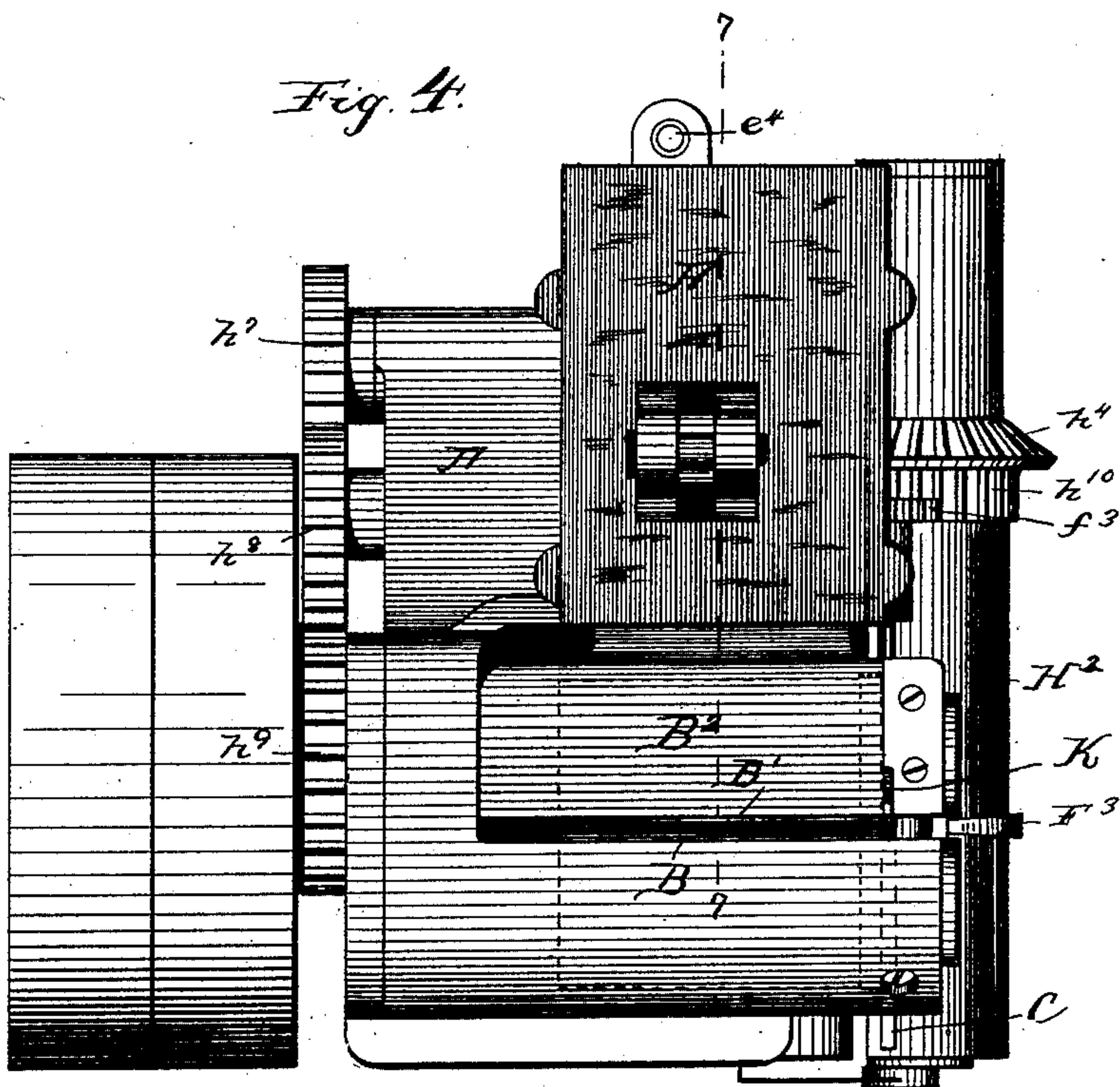
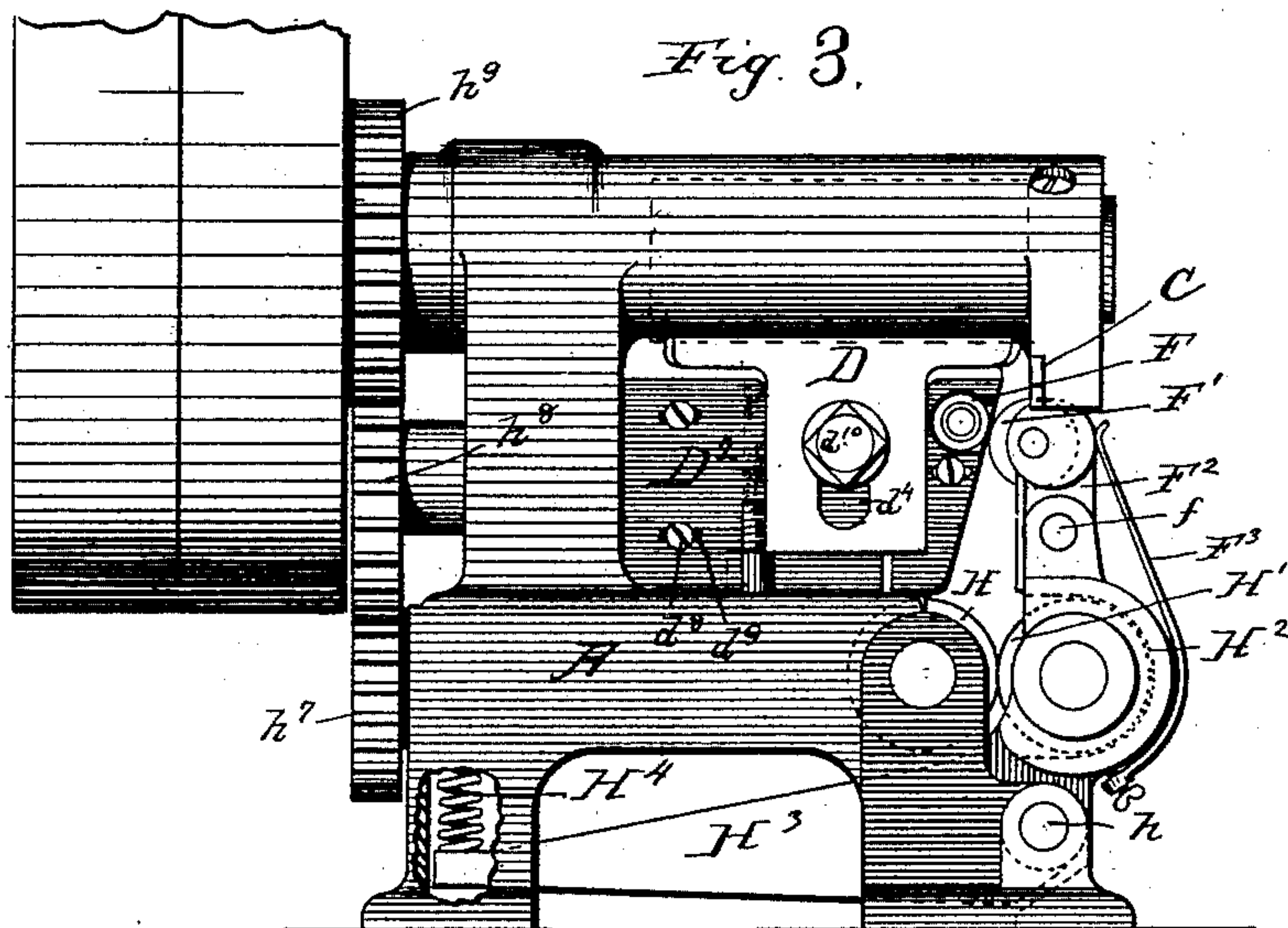
4 Sheets—Sheet 2.

C. E. ROBERTS.

LEATHER SCRAP SPLITTING MACHINE.

No. 358,883.

Patented Mar. 8, 1887.



Witnesses:

Sen. C. Curtis.

A. M. Munday.

Inventor:

Charles F. Roberts.

By Sunday Evans Adcock
his Attorneys:

(No Model.)

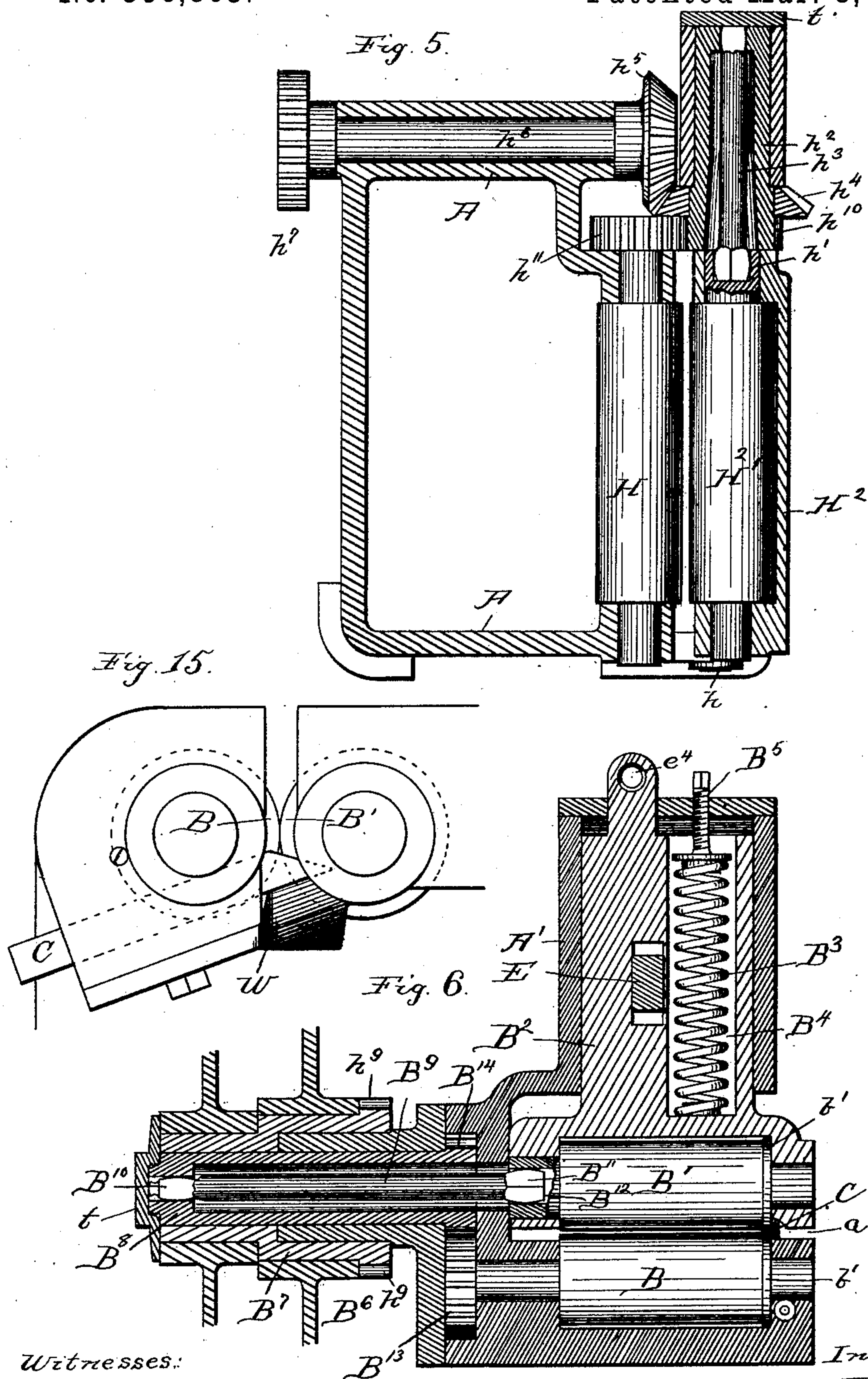
4 Sheets—Sheet 3.

C. E. ROBERTS.

LEATHER SCRAP SPLITTING MACHINE.

No. 358,883.

Patented Mar. 8, 1887.



Witnesses:
Lew. E. Curtis.
A. M. Munday.

Inventor:
Charles E. Roberts.
By Munday Evans & Adcock
his Attorneys:

(No Model.)

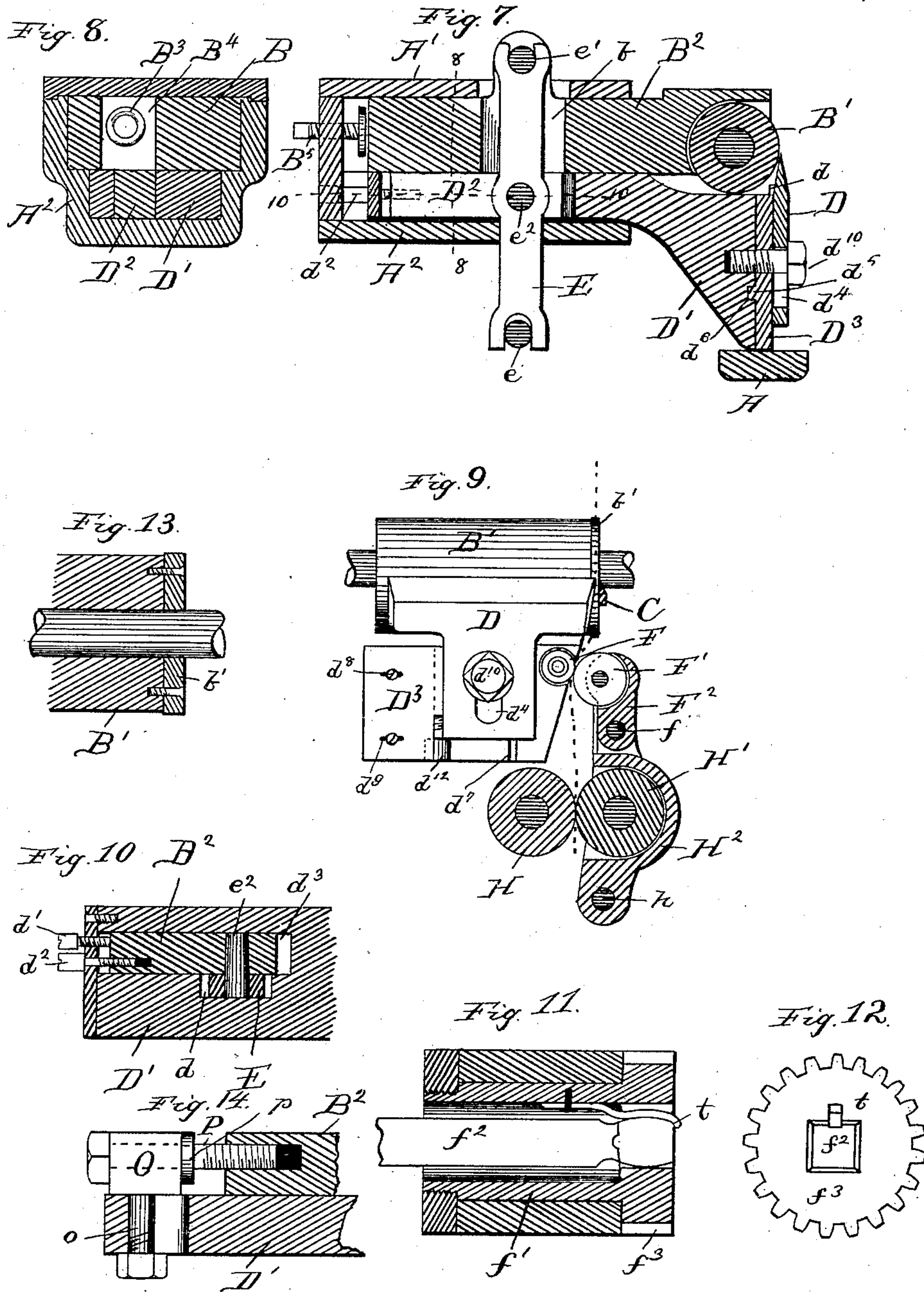
4 Sheets—Sheet 4.

C. E. ROBERTS.

LEATHER SCRAP SPLITTING MACHINE.

No. 358,883.

Patented Mar. 8, 1887.



Witnesses:

Lew. E. Curtis.

A. W. Munday.

Inventor:

Charles E. Roberts.

By Munday, Curtis & Adcock
his Attorneys.

UNITED STATES PATENT OFFICE.

CHARLES E. ROBERTS, OF CHICAGO, ILLINOIS.

LEATHER-SCRAP-SPLITTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 358,883, dated March 8, 1887.

Application filed October 26, 1886. Serial No. 217,221. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. ROBERTS, a citizen of the United States, residing in Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Leather-Scrap-Splitting Machines, of which the following is a specification.

My invention relates to machines for trimming or straightening one edge of leather-scrap and splitting the same in such way as to leave a narrow margin or hinge at its straightened edge, uniting the parts together, so as to form, when the two leaves or split parts are opened out, a piece of about double the area of the original scrap.

The object of my invention is to simplify and cheapen the construction as well as to increase the efficiency of the operation of such machines.

In my present improvement but a single pair of feed-rollers are employed to force and carry the leather-scrap against and by both the edge-trimming knife and the splitting-knife. The splitting-knife is mounted between the two feed-rollers and the edge-trimming knife at the end of the feed-rollers and transversely to the splitting-knife, a narrow space being left between the end of the splitting-knife and the edge-trimming knife, so as to leave an uncut margin or hinge at the straightened edge of the leather-scrap. As that portion of the scrap near the end of the feed-rollers necessarily encounters the increased resistance due to the edge-trimming knife over and above the resistance offered by the splitting-knife throughout the entire width of the scrap, where the two knives are thus engaged in operative position between and about a single pair of feed-rollers, the piece of scrap in passing through the feed-rollers will have a tendency to drag at the edge or corner adjacent to the edge-trimming knife. I obviate this difficulty by providing the feed-rollers with disks or shoulders of slightly-increased diameter at the ends adjacent to the edge-trimming knife, so that at this point, where the resistance is the greatest, the feed-rollers will have a firmer bite upon the leather-scrap. These shoulders are most conveniently formed on the feed-rollers by simply securing a pair of disks of slightly-increased diameter to the ends of the feed-rollers.

Heretofore in these machines it has been customary, by means of guides, spreading-blocks, or other devices on a line with the square end of the splitting-knife and with the edge-trimming knife, to pass or feed the scrap straight through the machine after it leaves the splitting-knife, in order that the scrap may pass the edge-straightening knife in a straight line, and thus produce the necessary straight edge for the hinge or uncut margin, without which the split scrap cannot be made to open out flat, as desired. I have found, however, after numerous experiments, that as the leaves of the split scrap are being opened out, while at the same time the scrap is being split by the knife, the split part of the scrap below the splitting-knife has a natural tendency to incline inward toward the base of the knife and pass down in an inclined line, because the opening of the split leaves, while the upper portion of the scrap is still unsplit, has a tendency to draw or incline the uncut margin or edge of the scrap inward toward the base of the splitting-knife; and I find that by mounting the flattening-rollers or flattening devices in this inclined path, which the scrap itself naturally takes after leaving the splitting-knife, all guides, spreading-blocks, or other devices may be dispensed with, and that the scrap will thus naturally pass and feed in a straight line past the edge-trimming knife and produce a straight edge for the leaves of the scrap to open or turn upon.

In my present improvement one of the feed-rollers is mounted in stationary bearings on the frame of the machine, while the other feed-roller is mounted upon a transverse slide and yieldingly pressed against the stationary feed-roller by means of a strong spring, and the splitting-knife is mounted upon a movable slide just below the movable feed-roller slide. The knife-slide is connected to the movable feed-roller slide by means of a lever pivoted at or near one end to the frame of the machine, at its other end to the feed-roller slide, and at its middle point to the knife-slide, so that whatever movement the feed-roller slide may have, owing to the thickness of the piece of leather passing between the two feed-rollers, the knife-slide will have just one-half that movement, and thus cause the knife to split the scrap accurately in the middle. For the

purpose of adjusting the position of the knife between the feed-rollers, this connecting-lever is pivoted to the knife-slide through the medium of an adjustable block secured to the knife-slide by adjusting-screws.

It frequently happens in the practical use of machines of this class that scraps of leather are presented which will form two useful pieces, if first divided into two pieces and then each part split with the dividing-line as the uncut margin or hinge of each part. The machines heretofore in use, however, have had no means of passing the scrap through the machine in such position that the trimming or edge-straightening knife would or could divide the scrap on an approximately median line. To enable my improved machine to accomplish this result, I provide its frame with a slot or opening at the trimming-knife end of the feed-rollers, so that any desired part of the scrap may overhang or extend beyond the trimming-knife and still not be obstructed by the frame as the scrap passes through the machine. I find, also, that it very much facilitates the practical operation of the machine to provide an aligning-bar above the feed-rollers and on a line with the trimming-knife, to guide the operator in turning or adjusting the irregular-shaped scrap into proper position for passing through the machine. By means of the aligning-bar the operator can readily turn the scrap into the proper position, so that the straightened edge of the scrap will be complete throughout without trimming off any more than necessary.

In the accompanying drawings, which form a part of this specification, and in which similar letters of reference indicate like parts, I have illustrated my invention as reduced to practice or embodied in a working-machine in the form I believe to be the best now known to me.

In said drawings, Figure 1 is an end elevation. Fig. 2 is a rear view; Fig. 3, a front view; Fig. 4, a plan; Fig. 5, a section on line 5 5 of Fig. 1; Fig. 6, a section on line 6 6 of Fig. 1. Fig. 7 is a vertical section on line 7 7 of Fig. 4. Fig. 8 is a section on line 8 8 of Fig. 7. Fig. 9 is a section on line 9 9 of Fig. 1. Fig. 10 is a section on line 10 10 of Fig. 7. Figs. 11 and 12 are detail views showing the device for communicating motion to one of the movable flattening-rollers; and Fig. 13 is a partial section of one of the feed-rollers. Fig. 14 shows a method of adjusting the knife relative to the feed-roll which may be employed, and Fig. 15 a modification.

In said drawings, A represents the main frame of the machine, B the fixed feed-roller mounted in suitable bearings thereon, and B' the movable feed-roller journaled upon the feed-roller slide B², which reciprocates in suitable guides, A', on the frame of the machine.

C is the edge-trimming knife secured on the frame of the machine at the end of the feed-rollers B B'.

D is the splitting-knife, arranged between

the feed-rollers B B' and mounted upon the knife-slide D', which reciprocates in suitable guides, A², on the frame of the machine just beneath the feed-roller slide B². The slides B² and D' are connected together by a link or lever, E, which is pivoted at or near its lower end to the frame A by a pin, e, and at its upper end to the slide B² by a pin, e', and it is pivoted at its middle point to the slide B² by a pin, e². The slides B² and D' are provided with slots or openings b d, through which the lever E extends. The slide D' is also furnished with an adjustable block, D², secured in the slot d³ by adjusting-screws d' d², to which block the lever E is pivoted, so that the position of the knife between the feed-rollers may be adjusted. The roller B' is pressed against the roller B by means of a spring, B³, fitted in the cavity B⁴ in the roller-slide B² and pressing at its outer end against an adjusting-screw, B⁵, secured in the frame A. As the lever E is connected at its middle point to the knife-slide, it is obvious that the knife D will have just half the movement of the movable roller B' when the same is separated from the roller B by the passage of a piece of leather between them, and the leather will therefore be split in the middle by the knife.

The feed-rollers B B' are each furnished at the end adjoining the trimming-knife C with a slight shoulder or portion of slightly-increased diameter, b' b', so that at this point said rollers will have a firmer and tighter grip upon the piece of leather passing between them. These shoulders are preferably formed by simply securing, by means of screws or otherwise, thin disks of slightly greater diameter than the feed-rollers upon the ends of the feed-rollers. The periphery of these shoulders or disks b' b' is preferably cylindrical or parallel to the surface of the rollers B B'.

The frame is provided with a slot or opening, a, between and at the end of the rollers B B', adjacent to the trimming-knife C, so as to offer no obstruction to the piece of leather, whatever part of it may be severed by the edge-straightening knife. The feed-roller B' is driven from the driving-pulley B⁶, keyed to the sleeve B⁷, and which sleeve is keyed to a hollow shaft, B⁸, journaled in the frame of the machine by means of a coupling-rod, B⁹, having a square or angular end, B¹⁰, which fits loosely in a corresponding socket in the end of the hollow shaft B⁸, and a similar square or angular end B¹¹, which fits loosely in a similar socket, B¹², in the end of the driving-roller shaft. By this means the roller B' may move freely in and out or to and from the fixed roller B. The roller B is driven by means of a gear, B¹³, on its shaft, which meshes with the gear B¹⁴ on the hollow shaft B⁸.

The knife D is secured to the knife-slide D' by means of a screw, d¹⁰, which enters a threaded hole in the knife-slide and passes through a vertical slot, d¹, in the knife, so that the knife may be adjusted up and down. The face of the knife-slide D' is furnished with a

horizontally-adjustable plate or block, D^3 , upon which the knife fits, so that the knife may be adjusted longitudinally to and from the edge-trimming knife. This adjusting-plate D^3 is furnished with a horizontal rib, d^5 , which fits in a corresponding groove, d^6 , in the knife-slide D' . The opposite face of the adjusting-block D^3 is also furnished with a vertical groove or way, d^7 , in which a corresponding rib or projection on the knife fits. The adjusting-block D^3 is secured to the knife-slide by screws d^8 , which pass through horizontal slots d^9 in the adjusting-block.

By means of the adjusting block or plate D^3 and the horizontal and vertical guides or ribs and grooves therein and in the knife-slide and knife the knife may be readily adjusted both up and down to bring its cutting-edge into proper relation to the feed-rollers $B B'$, and endwise to bring its end or corner into proper relation with the edge-straightening knife C . The edges of the splitting-knife and edge-straightening knife should be both about on the same height. I prefer to arrange the edge of the splitting-knife about one-eighth or one-quarter of an inch above the cutting-edge of the trimming-knife. However, the trimming-knife may be on a level with the cutting-knife, or even slightly lower.

$F F'$ are a pair of flattening-rollers, one of which, F , is journaled in suitable bearings on the knife-slide D' , and the other of which, F' , is journaled upon a swinging bracket, F^2 , pivoted at f to any suitable part of the machine, but preferably to the pivotal bracket H^2 . The movable roller F' is pressed against the fixed roller F by means of a spring, F^3 , which may also be preferably secured to the bracket H^2 . These flattening-rollers F and F' are mounted in relation to the edge-trimming knife about as shown in Figs. 3 and 9 of the drawings—that is to say, below said knives—and inclined inward toward the splitting-knife, and in the position or path which the straightened edge of the scrap naturally assumes while its leaves are being opened as it passes down from the knives. In Fig. 9 the path of the scrap or of its straightened edge is indicated by the dotted line. By combining the flattening-rollers with the knives in this manner, so that the former are located in the path which the edge of the scrap naturally assumes as its leaves are being spread out, no guiding devices are required to direct the scrap to the flattening-rollers, other than the mere feed-rollers $B B'$, which force the scrap forward.

Where the flattening rollers or devices are arranged in a vertical line with the end of the splitting-knives or the face-edge of the trimming-knife, as heretofore, and the scrap thus required to be directed out of its natural course, intermediate guide devices have been required to direct the scrap to the flattening-rollers, and this forced diversion of the scrap from its natural course has also tended (more or less) to turn the scrap as it passes through

the feed-rollers, and thus cause the edge-straightening knife to produce a curved instead of a straight edge. By thus combining the flattening-rollers with their meeting line in an inclined position in relation to a line passing at right angles to the feed-rollers through the hinge or margin space between the end of the splitting-knife and the edge of the trimming-knife the scrap has no tendency whatever to turn or to pass otherwise than in a straight line by the edge-trimming knife.

The flattening-roller F is not driven except by friction from its companion roller F' . The movable roller F' is driven from the shaft f' by means of a connecting or tumbling rod, f^2 , having square or angular ends similar to the connecting-rod B^9 , before described in relation to the movable feed-roller B' .

As the pressure of the flattening-rollers $F F'$ is sometimes hardly sufficient to adequately flatten out the split leaves of very thick and hard scrap-leather, I provide the machine with a second and larger pair of flattening-rollers, $H H'$, both of which are positively driven. The roller H is mounted in fixed bearings on the frame of the machine, while the roller H' is journaled in suitable bearings on the swinging bracket H^2 , pivoted at h to the frame of the machine. The pivotal bracket or lever H^2 has a bent arm, H^3 , furnished with a spring, H^4 , which presses against the frame of the machine, and by which the roller H' is pressed against the roller H with the required force to completely flatten out into a plain sheet the leaves of the split scrap. The movable roller H' has a square or angular socket, h' , in its end and is driven from the hollow shaft h^2 by means of a connecting or tumbling rod, h^3 , similar to the rod B^9 , before described. The hollow shaft h^2 is journaled in the frame of the machine and is furnished with a bevel-gear, h^4 , which meshes with a bevel-gear, h^5 , on the shaft h^6 . The shaft h^6 is journaled on the frame of the machine and has a spur-gear, h^7 , which meshes with an intermediate gear, h^8 , that meshes with a gear, h^9 , on the sleeve B^7 of the hollow driving-shaft B^8 . The hollow shaft h^2 has a gear, h^{10} , that meshes with a gear, h^{11} , on the shaft of the other flattening roller, H . The hollow shaft f' , from which the flattening-rollers $F F'$ are driven, has a spur gear, f^3 , which meshes with an idler-gear, f^4 , that meshes with the gear h^{10} on the hollow shaft h^2 .

To facilitate the turning of the scrap of leather x into proper position to pass through the machine, I provide the machine with an aligning-bar, K , the straight edge of which is on a line with the ends of the feed-rollers $B B'$, and with the edge of the trimming-knife C . This aligning-bar is secured to the frame of the machine and projects above the feed-rollers, as shown in Fig. 2. The operator, by placing a scrap of leather against or directly behind or in front of this straight-edge or aligning-bar, can readily start the scrap between the feed-rollers in such position that

the edge-trimming knife will receive a wide enough trimming to produce a complete straight edge, and without cutting off an unnecessarily wide strip.

5 My machine may be very readily arranged or adjusted so that the splitting-knife D will serve to split the piece of leather in the middle, or leave one part of the leather of any desired even thickness, instead of splitting the
10 leather exactly in the middle. This may be done by simply removing the pin e' , and thus disconnecting the roller-slide B^2 from the end of the connecting-lever E, and then connecting the roller-slide B^2 and knife-slide D' rigidly together in any suitable manner. For
15 this purpose I provide both the roller-slide and knife-slide with registering-holes e^4 , in which the pin e' may be inserted. When this is done, the knife will of course have the same
20 movement as the roller-slide or feed-roller B' ; and by adjusting the knife-slide so that the knife is the required distance from the roller B' the knife D will of course split the scrap so that one of the split parts is of a definite
25 even thickness throughout. When the machine is thus used for skiving pieces of leather, the edge-trimming knife C may be removed, if desired; or the splitting-knife may be adjusted longitudinally, so that its end or corner
30 is in line with the edge of the trimming-knife C, and thus straighten the edge of the piece at the same time it is skived.

As the connecting or tumbling rods h^3 , B^9 , and f^2 fit loosely at each end in their sockets
35 or hollow shafts, so as to permit the requisite lateral movement of the rollers, I provide the hollow shafts h^2 , B^8 , and f' with caps or other devices t , to hold said connecting-bars from longitudinal movement.

40 I do not herein claim, broadly, a splitting-knife slide connected with the movable feed-roller, so that the knife and knife-slide will have half the movement of the feed-roller, as that is the subject of another application heretofore filed by me, and now pending in the
45 Patent Office; nor do I herein claim the combination and arrangement of the splitting-knife and edge-trimming knife in operative position between or about a single pair of
50 feed-rollers, as herein shown and described, as that forms the subject of another application heretofore filed by me and now pending in the Patent Office; nor do I herein claim the means herein shown and described for
55 communicating motion to the movable feed-roller—that is to say, the connecting-rod B^9 and its associated parts—as that forms the subject of another application heretofore filed by me, and now pending in the Patent Office.

60 The applications above referred to are Serial Nos. 179,643, filed October 12, 1885, and 197,825, filed April 5, 1886; and I desire it to be understood that I do not herein claim that which is claimed in said previous applications.

65 The splitting-knife D is provided with an inclined end adjacent to the edge-straighten-

ing knife C, and the flattening-rollers $F F'$ are mounted about in line with this inclined end of the splitting-knife. By cutting away or
70 inclining the end of the splitting-knife the knife is prevented from obstructing the passage of the leather scrap in its natural path. The knife D is adjusted up and down, when the screw or bolt d^{10} is loosened, by means of
75 an adjusting-screw, d^{12} , screwed into the block D^3 , the shoulder of which fits against the lower edge of the knife.

At Fig. 14 I have illustrated a method of adjusting the knife relative to the feed-roll, so
80 the leather may be cut to any thickness desired. In this construction the roller-slide is provided with a laterally-projecting head, O, in which is journaled a screw, P, having a threaded connection with the knife-slide. The
85 head O is clamped to the roller-slide by the screw o when the head is in service; but at other times the clamp is released. A collar, p , is placed upon the screw P to confine it in the head.

At Fig. 15 I have shown a guard or deflector, w , secured to the frame and fitting just below
90 the trimming-knife C, for the purpose of deflecting the shaving or trimming cut from the scrap by the knife C. The swinging frames F^2 and H^2 of the flattening-rollers F' and H'
95 should both be provided with stops to limit their inward movement, so that the rollers $F F'$ and $H H'$ cannot quite touch each other.

If preferred, the arm F^2 may be pivoted directly to the main frame of the machine, instead of to the swinging arm H^2 , and the spring
100 F^3 may also be secured to the rigid frame, if preferred.

When the machine is to be used for the purpose of skiving, and the pin e' , which connects
105 the lever E with the knife-slide B^2 , is removed, the knife may be adjusted and fixed at a determinate distance from the fixed feed-roller B by means of an adjusting-screw or other device connecting the knife-slide with the main
110 frame of the machine. In some cases this is preferable to adjusting the knife-slide so that the knife is at a fixed distance from the movable roller B' , as before mentioned, and as illustrated in Fig. 14.

I am aware that heretofore the feed-rollers have been made of slightly conical form, as
115 shown and described in the patent to George I. Tyler, No. 319,357, of June 2, 1885, for the purpose of crowding the scrap or stock up against the edge-guide with which such machines are
120 provided, and I hereby expressly disclaim the same as not of my invention. In my invention the feed-rollers are cylindrical, and are furnished with a cylindrical shoulder or disk
125 at one end, of slightly-increased diameter, for the purpose of overcoming the increased resistance occasioned by the edge-turning knife at that edge or corner of the scrap.

I do not herein claim the following subject-matter, to wit:

“In a leather-splitting machine having a

fixed and a movable feed-roll and a splitting-knife having its cutting-edge between and parallel with them and movable at right angles to their axes, the combination of the movable feed-roll or the movable support upon which it is mounted, with the movable splitting-knife or the movable support upon which it is mounted, and mechanism connecting the roll or roll-support with the knife or knife-support to adjust the edge of the knife between the rolls to split different thicknesses of stock in the middle;" nor, "the combination, with an edge-straightening knife, of a splitting-knife and feed-rolls for carrying the stock to be trimmed and split against the said knives, a gage-plate or guide and a spreading-block or opener at the end of the said splitting-knife, and a pressing device or rollers for flattening out the pieces which have been trimmed and split;" nor, "in a leather-splitting machine, the combination of feed-rolls, a splitting-knife, the edge-guide, and the flaring opener, both guide and opener being adjacent to one end of the splitting-knife;" nor, "in a leather-splitting machine, a splitting-knife in combination with a flaring opener set rearwardly of the edge of said knife, whereby as a piece of leather which has been split to a hinge at the edge passes the knife the flaps of the split piece will be spread toward or into the same plane;" nor, "the combination, in a leather-scrap-splitting machine with a single pair of feed-rollers, of an edge-straightening knife and a splitting-knife, both arranged in operative position between said one and the same pair of feed-rollers, said edge-straightening knife being at the end of said splitting-knife, with a space between the same to leave an uncut margin or hinge uniting the two leaves or split parts of the scrap," such being the subjects-matter of several interferences heretofore declared between my said former applications, Serial Nos. 179,643 and 197,825, and certain other parties.

I claim—

1. The combination, with a pair of feed-rollers, a splitting-knife and an edge-straightening knife, of a pair of flattening-rollers, $F F'$, below and under said splitting-knife, the ends of the splitting-knife projecting entirely over the inner roller, F , and partially over the outer roller, F' , so that the meeting line or face of said rollers $F F'$ is in an inwardly-inclined path from a vertical one or line passing between the edge-straightening knife and the end of said splitting-knife, substantially as specified.

2. In a machine for splitting and spreading leather-scrap, the combination, with a pair of feed-rollers, of a splitting-knife and a pair of flattening-rollers below and under said splitting-knife, the end of said splitting-knife projecting entirely over one of said flattening-rollers and partially over the other, so that the meeting line or face of said flattening-rollers is in an inwardly-inclined path downward from the end of said splitting-knife, substantially as specified.

3. In a machine for splitting and spreading leather-scrap, the combination, with a pair of feed-rollers and a splitting-knife, of a pair of flattening devices, substantially such as described, or their equivalents, below and under said splitting-knife, between which flattening devices the uncut margin or edge of the scrap is passed, the end of said splitting-knife projecting entirely over one of said flattening devices and partly over the other one, so that their meeting line or face is in an inwardly-inclined path downward from the end of said splitting-knife, substantially as specified.

4. The combination, with a fixed feed-roller, of a movable feed-roller, a feed-roller slide, a splitting-knife, a splitting-knife slide, and a connecting-lever, E , pivoted at or near one end to the frame of the machine, at the other end to the roller-slide, and at its middle to said knife-slide, substantially as specified.

5. The combination, with a fixed feed-roller, of a movable feed-roller, a feed-roller slide, a splitting-knife, a splitting-knife slide, and a connecting-lever, E , pivoted at or near one end to the frame of the machine, at the other end to the roller-slide, and at its middle to said knife-slide, said knife-slide being provided with an adjustable block, D^2 , to which said connecting-lever is directly pivoted, substantially as specified.

6. The combination, with feed-rollers $B B'$, of feed-roller slide B^2 , splitting-knife D , splitting-knife slide D' , suitable guides or ways on the frame of the machine, in which said slides $B^2 D'$ are mounted, a connecting-lever, E , pivoted to the frame of the machine and to said slides $B^2 D'$, said slides being mounted one above the other and provided with slots or openings through which said connecting-lever E passes, substantially as specified.

7. The combination, with a fixed feed-roller, of a movable feed-roller, a feed-roller slide, a splitting-knife, a splitting-knife slide, and a connecting-lever, E , pivoted at or near one end to the frame of the machine, at the other end to the roller-slide, and at its middle to said knife-slide, and a spring for forcing said movable roller against said fixed roller, substantially as specified.

8. The combination, with feed-rollers $B B'$, of feed-roller slide B^2 , edge-trimming knife C , splitting-knife D , splitting-knife slide D' , connecting-lever E , pivoted to the frame of the machine and to each of said slides $B^2 D'$, and a knife-adjusting block or plate, D^3 , provided with a horizontal rib or guide on one face and a vertical groove or guide on the other, substantially as specified.

9. The combination, with the feed-rollers, of a splitting-knife, D , an adjusting block or plate, D^3 , and a knife slide or head, D' , said adjusting-block being furnished with a horizontal rib fitting in a corresponding groove in said knife-slide, and a vertical guide or groove in which fits a corresponding rib or guide on the knife, substantially as specified.

10. The combination, with a fixed feed-

roller, of a movable feed-roller, a reciprocating feed-roller slide upon which said movable feed-roller is journaled, a parallel reciprocating splitting-knife slide, a splitting-knife carried upon and rigidly secured to said knife-slide, said knife-slide and roller-slide being mounted in rigid parallel guides on the frame of the machine, one above the other, and means for connecting said slides together, so that the knife-slide will be operated by the movement of the roller-slide and the splitting-knife kept parallel to the feed-rollers, substantially as specified.

11. The convertible device for splitting leather in the middle, or skiving the same, consisting in a fixed feed-roller, a movable feed-roller, a feed-roller slide, a splitting-knife, a splitting-knife slide, said slides being mounted in suitable guides on the frame of the machine, one above the other, a connecting-lever pivoted to the frame of the machine at one end and at its middle to said knife-slide and provided with means for pivoting the same at its other end to said roller-slide, said roller-slide and knife-slide being also provided with means for connecting the same rigidly together, substantially as specified.

12. The convertible device for splitting leather in the middle, or skiving the same, consisting in a fixed feed-roller, a movable feed-roller, a feed-roller slide, a splitting-knife, a splitting-knife slide, said slide being mounted in suitable guides on the frame of the machine, one above the other, a connecting-lever pivoted to the frame of the machine at one end and at its middle to said knife-slide and provided with means for pivoting the same at its other end to said roller-slide, said roller-slide and knife-slide being also provided with means for connecting the same rigidly together, and an adjusting-block secured to said knife-slide and to which said connecting-lever is directly pivoted, substantially as specified.

13. The combination, with a pair of feed-rollers, a splitting-knife, and an edge-trimming knife, of an aligning-bar, K, projecting above the feed-rollers in line with the cutting-edge of the trimming-knife, substantially as specified.

14. The combination, with a pair of feed-rollers, an edge-trimming knife, and a splitting-knife, of a pair of flattening-rollers set under the overhanging end of the splitting-knife, and a second pair of flattening-rollers below the former, the upper pair of flattening-rollers serving to partially spread and flatten out the split leaves of the scrap and the lower pair of rollers completing such operation, whereby the passage of the split scrap through the machine is facilitated, substantially as specified.

15. The combination, with a splitting-knife and an edge-straightening knife transverse to said splitting-knife, of a pair of feed-rollers provided with the square shoulders of slightly increased diameter at their ends adjacent to said edge-straightening knife, substantially as specified.

16. The combination, with a splitting-knife and an edge-straightening knife transverse to said splitting-knife, of a pair of feed-rollers provided with shoulders of slightly-increased diameter at their ends adjacent to said edge-straightening knife, said shoulders consisting of thin disks secured to the ends of said rollers, substantially as specified.

17. The combination, with feed-rollers B B', of edge-straightening knife C, splitting-knife D, flattening-rollers F F', swinging bracket F², flattening-rollers H H', and pivoted bracket H², said bracket F² being pivoted to bracket H², substantially as specified.

18. The combination, with feed-rollers B B', of edge-straightening knife C, splitting-knife D, flattening-rollers F F', swinging bracket F², flattening-rollers H H', and pivoted bracket H², said bracket F² being pivoted to bracket H², arm H³, and springs F³ and H⁴, substantially as specified.

19. The combination, with the frame of the machine, of feed-rollers B B', feed-roller slide B², spring B⁴, driving-pulley B⁶, sleeve B⁷, hollow shaft B⁸, and coupling-rod B⁹, having square or irregular ends fitting loosely in sockets in the shaft of said movable roller B' and in said hollow shaft B⁸, substantially as specified.

20. The combination, with feed-rollers B B', feed-roller slide B², spring B⁴, edge-knife C, splitting-knife D, splitting-knife slide D', lever E, connecting said slides B² D', flattening-rollers F F' and H H', driving-pulley B⁶, and connecting mechanism, substantially as herein shown and described, for communicating motion to said rollers B B' F' and H H', substantially as specified.

21. In a machine for splitting and spreading leather scrap, the combination, with a pair of feed-rollers and a splitting-knife having an outwardly-inclined end, of a pair of flattening devices, substantially such as described, or their equivalents, between which the uncut margin or edge of the scrap is passed, the inclined end of said splitting-knife projecting beyond and over the meeting line or faces of said spreading devices, substantially as specified.

22. The combination, with a pair of feed-rollers, of a splitting-knife having an outwardly-inclined end, and a pair of flattening-rollers below said splitting-knife and in line with its inclined end, substantially as specified.

23. The combination, with a pair of feed-rollers, of a trimming-knife, C, a splitting-knife, D, having an outwardly-inclined end adjacent to said trimming-knife, and a pair of flattening-rollers below said splitting-knife and in line with its inclined end, substantially as specified.

24. The combination of splitting-knife D, having vertical slots d¹, with block D², having vertical guide or groove for said knife, and vertical adjusting-screw d¹², for adjusting the knife up and down, substantially as specified.

25. In a convertible leather splitting and

skiving machine, the combination, with a pair of feed-rollers, of a movable splitting-knife, a splitting-knife slide furnished with detachable mechanism, substantially as described, or its equivalent, for operating said splitting-knife slide, and also with a detachable device, substantially as described, or its equivalent, for connecting or securing said knife-slide rigidly in a fixed position in relation to one of said feed-rollers, substantially as specified.

26. In a convertible leather splitting and skiving machine, the combination, with a fixed feed-roller, of a movable feed-roller, a reciprocating slide upon which said movable feed-roller is journaled, a splitting-knife, and a reciprocating slide carrying said knife, said knife-slide and roller-slide being provided with detachable connecting mechanism, substantially as described, or its equivalent, whereby the knife-slide may be operated by the movement of the roller-slide, and said knife-slide being also furnished with means, substantially as described, or its equivalent, for securing it

rigidly in position in relation to one of said feed-rollers, substantially as specified.

27. The combination, with a fixed feed-roller, of a movable feed-roller, a feed-roller slide, a splitting-knife, a splitting-knife slide, and a lever pivoted to the frame of the machine and to said knife-slide and furnished with means, substantially as described, or its equivalent, for detachably pivoting it to said roller-slide, said knife-slide being also furnished with means, substantially as described, or its equivalent, for securing it rigidly in position in relation to one of said feed-rollers, substantially as specified.

28. In a machine for splitting leather in the middle, a clamp for uniting the slide of one of the feed-rolls and the knife-slide rigidly together, in combination with the roll and knife and their slides, substantially as specified.

CHARLES E. ROBERTS.

Witnesses:

H. M. MUNDAY,
EDMUND ADCOCK.