

(No Model.)

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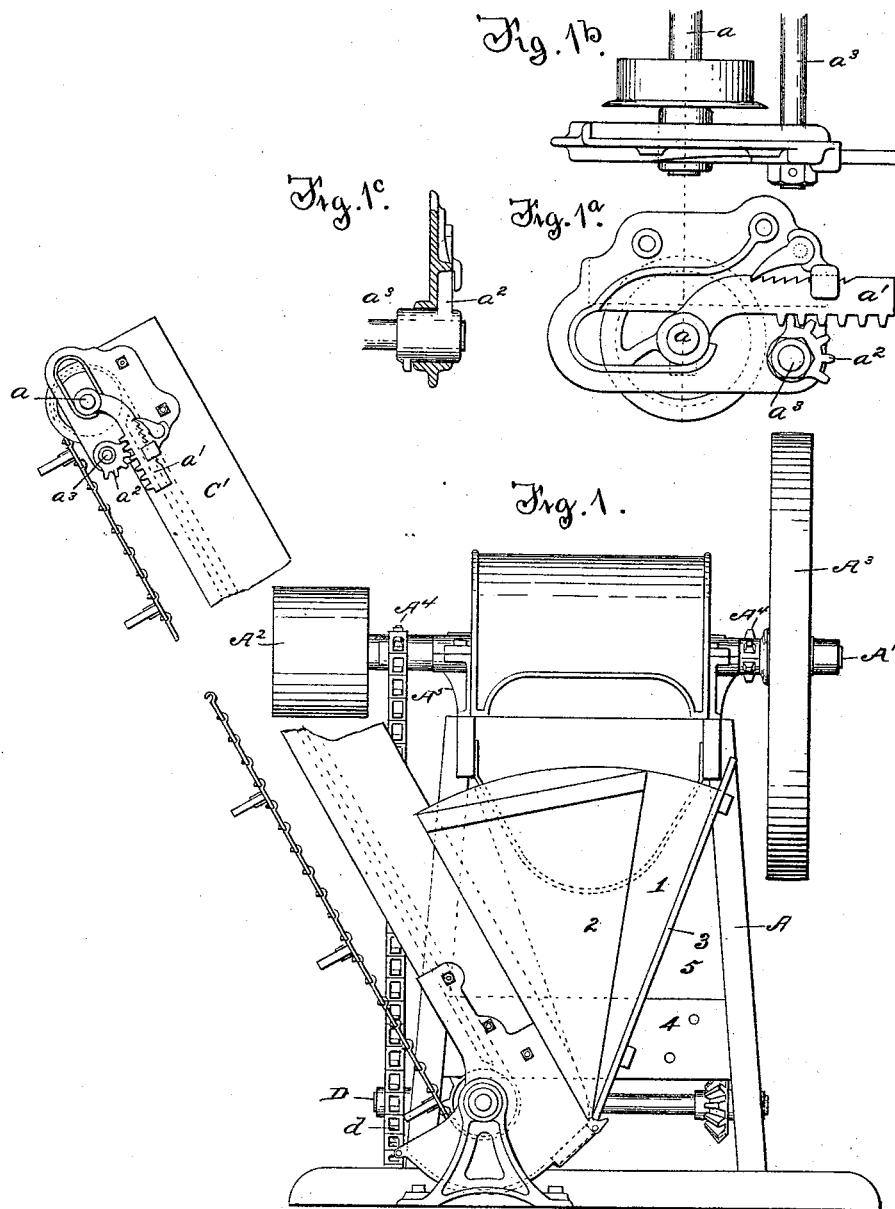
E. W. ROSS, Dec'd.

M. F. Ross, Executrix.

CARRIER ATTACHMENT.

No. 492,751.

Patented Feb. 28, 1893.



WITNESSES:

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(No Model.)

6 Sheets—Sheet 2.

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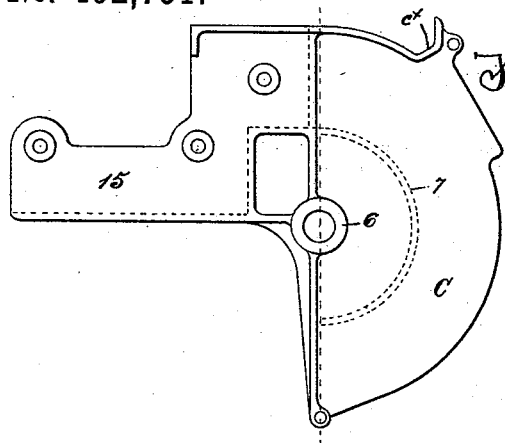


Fig. 2^a.

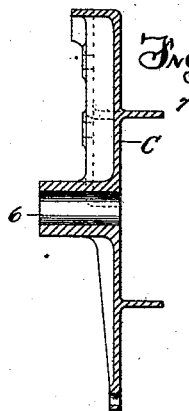


Fig. 2^b.

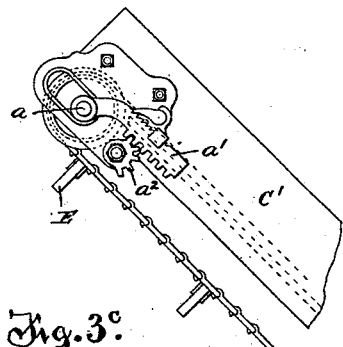


Fig. 3^c.

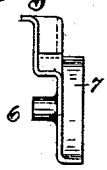


Fig. 3.

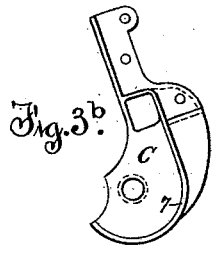


Fig. 3^b.

Fig. 2.

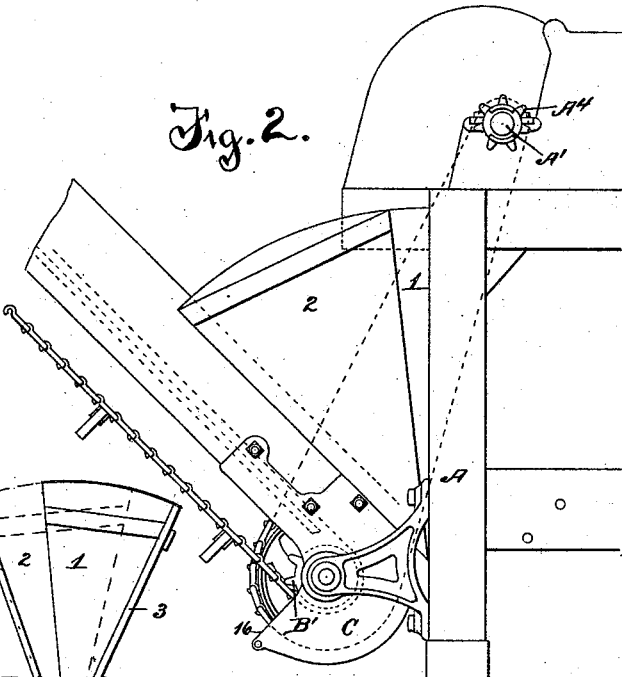


Fig. 3^a.

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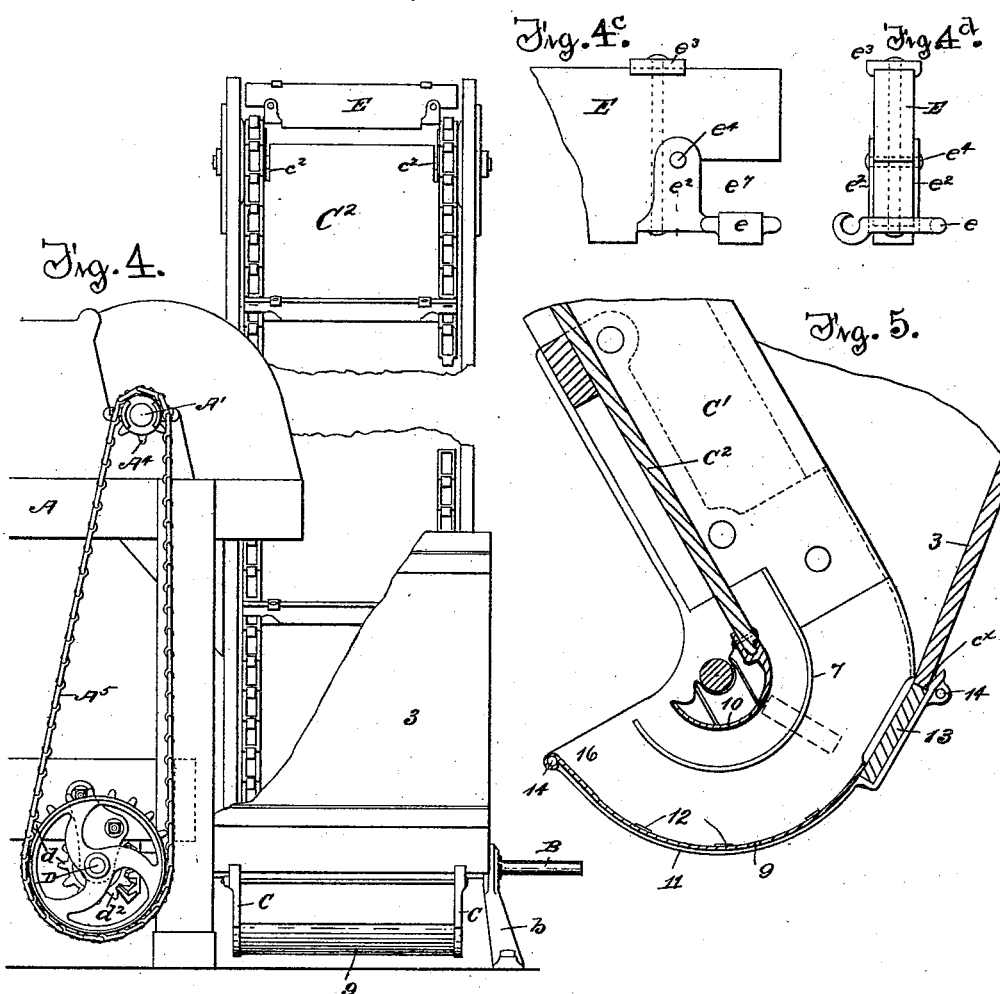
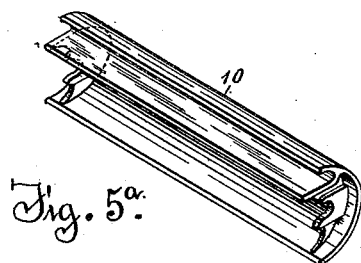
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6 Sheets—Sheet 4.

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Fig. 6.

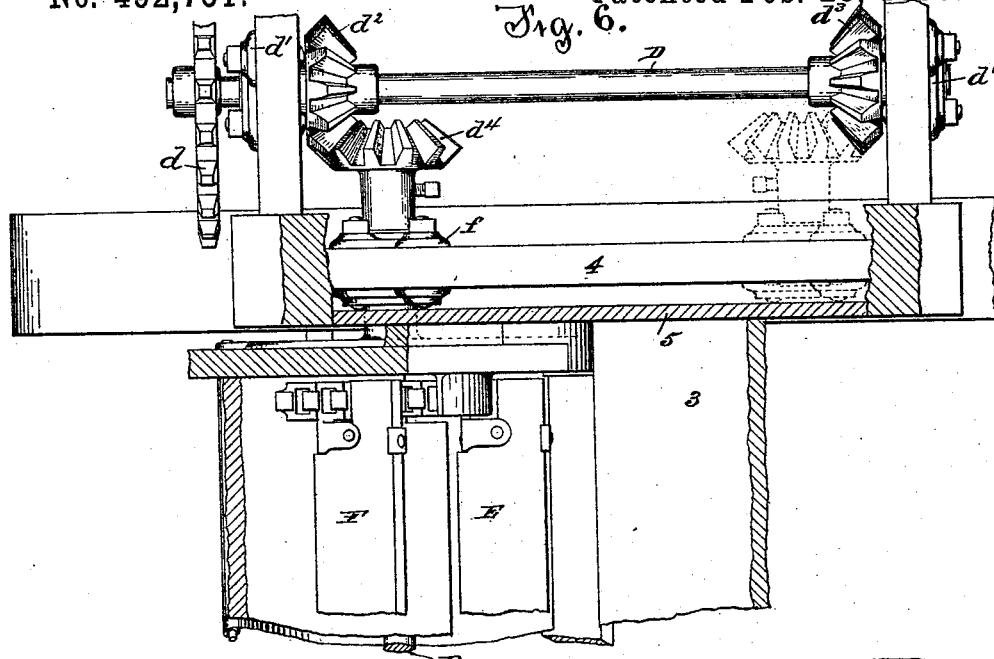
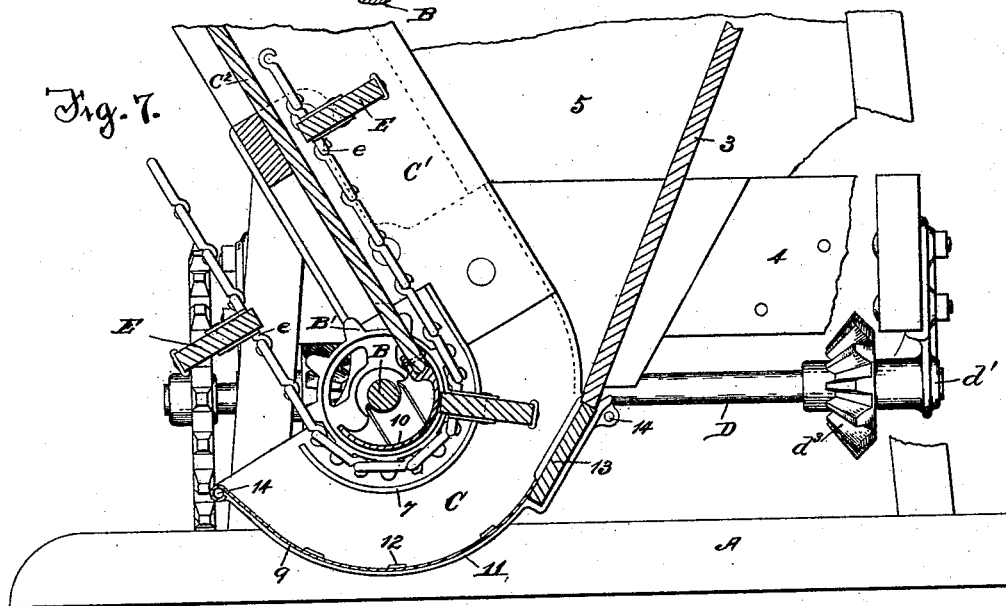


Fig. 7.



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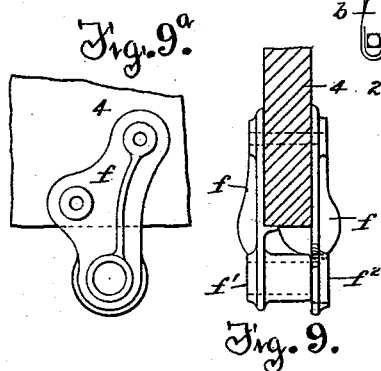
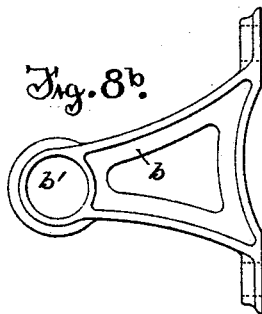
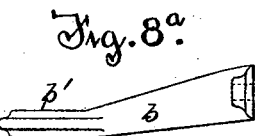
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Patented Feb. 28, 1893.



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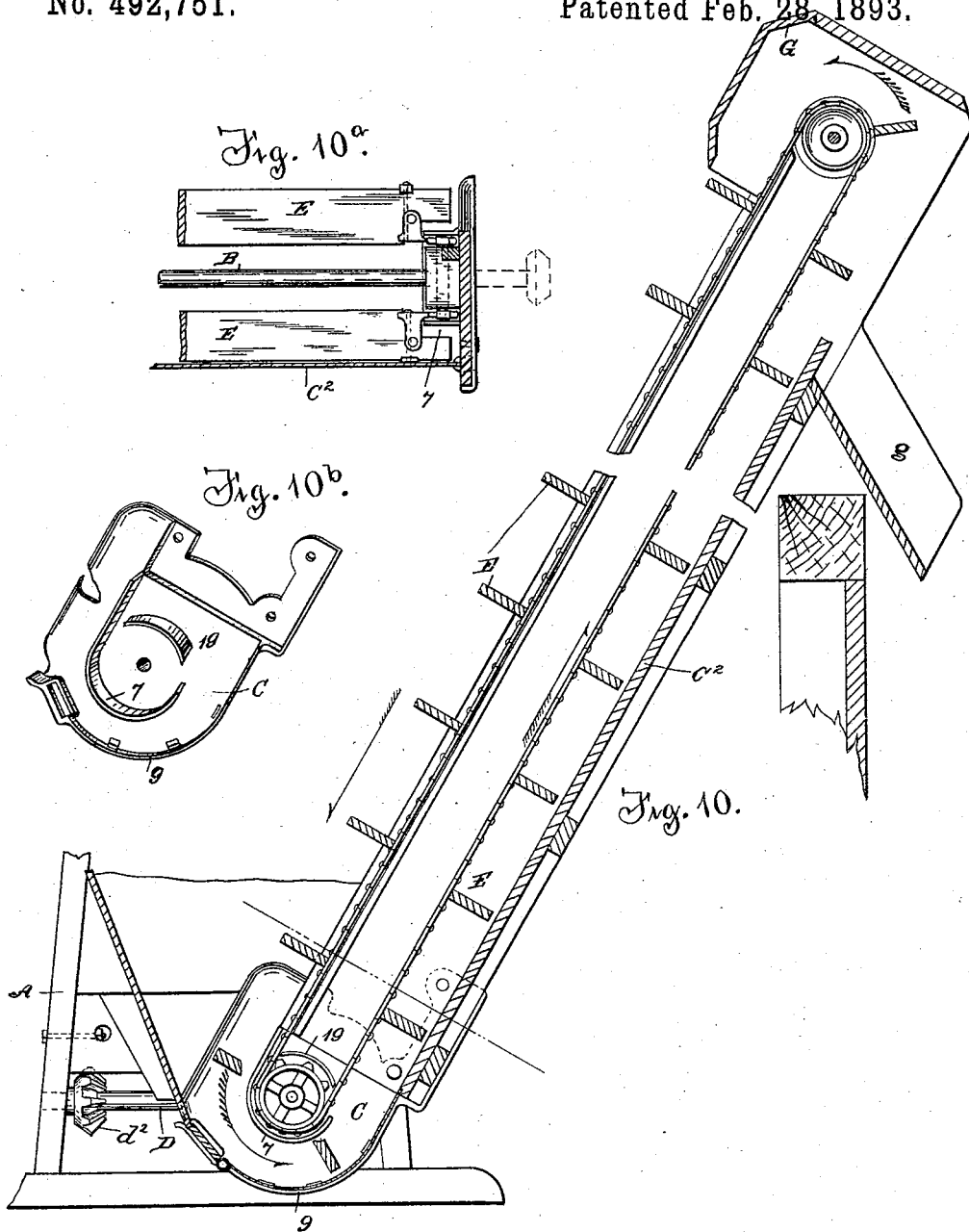
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WITNESSES
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UNITED STATES PATENT OFFICE.

ELMORE W. ROSS, OF SPRINGFIELD, OHIO; MARY F. ROSS EXECUTRIX OF
SAID ELMORE W. ROSS, DECEASED.

CARRIER ATTACHMENT.

SPECIFICATION forming part of Letters Patent No. 492,751, dated February 28, 1893.

Application filed September 16, 1891. Serial No. 405,874. (No model.)

To all whom it may concern:

Be it known that I, ELMORE W. ROSS, a citizen of the United States, and a resident of Springfield, county of Clark, and State of Ohio, have invented a new and useful Improvement in Carrier Attachments, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification.

My invention relates to an improvement in carrier attachments to feed cutters for adapting them to machines required to cut in narrow or confined places. In the ordinary construction of these attachments, it has been usual to arrange the lower shaft of a side delivery carrier at or near the center of the width of the machine delivering thereto, as described and shown in Letters Patent No. 278,049, granted to me May 22, 1883, in which the carrier actuating shaft was placed as described and so high that owing to the carrier sides coming in contact with the projecting frame of the machine or with the knife cover or cylinder, it could not be raised to an angle adapting it to very narrow spaces.

The object of my present improvement is to overcome this difficulty, and, to this end, the invention consists in providing a carrier, pivoted to permit its adjustment around the lower carrier-actuating shaft with a boot connected with said pivoted end and located low down near the surface on which the machine stands, so as to adapt such machine to readily deliver thereto; in the construction of said boot; in the arrangement of said carrier actuating shaft at the side of the cutting machine on which the carrier delivers the cut material, and in certain details of construction and arrangement as hereinafter described and claimed.

In the accompanying drawings:—Figure 1 shows the cutting machine in rear or discharge end elevation with the carrier attachment applied to deliver to the right hand side thereof, in side elevation. Figs. 1^a, 1^b and 1^c are detail views of the carrier tension adjusting devices. Fig. 2 is a side elevation of the rear end of the cutting machine and of the carrier, the latter arranged to deliver "straight away." Figs. 2^a and 2^b are detail views of the carrier boot castings. Fig. 3 is a side elevation of

the carrier and boot, showing a modification in the construction of the latter, and Figs. 3^a, 3^b and 3^c are detail views of the form of boot shown in Fig. 3. Fig. 4 is a right hand side elevation of the discharge end of the cutter with the carrier applied to deliver to the left hand side. Figs. 4^c and 4^d are detail views showing the carrier bucket attachments. Fig. 5 shows a vertical section through the carrier boot and Fig. 5^a a perspective view of the carrier bucket guard. Fig. 6 is a plan view, partly in section, showing the carrier actuating gearing. Fig. 7 an end view of the same, with the carrier in section. Fig. 8 is a plan view of the parts shown in Fig. 1, and Figs. 8^a and 8^b side and end elevations of the outer, carrier-supporting bracket or stand. Figs. 9 and 9^a are detail views of the pendent compound bracket on the cutter frame, in which bracket the carrier actuating shaft has its bearings. Fig. 10 shows in vertical elevation, a carrier arranged to run in the reverse direction from that shown in the other figures; i. e., with the flights pendent in the operative part of their movement, and Figs. 10^a and 10^b are detail views showing the construction of the boot irons when the form of carrier shown in Fig. 10, is employed.

The cutting machine may be of any usual type, preferably, that employing the "up cut" knife cylinder, A, indicating the frame thereof and A' the knife cylinder shaft upon the ends of which are removably secured interchangeable band and fly wheels A², A³, with a sprocket wheel adjacent to each and clutched thereto and one of which, through a drive chain A⁵, actuates a sprocket wheel *d* fast on a low down shaft D. The shaft D is journaled in brackets or hangers *d'* secured to and pendent from the lower longitudinal bars of the cutting frame as shown in Figs. 4 and 7, thereby bringing the shaft D as low down as practicable and leave space for the operative parts connected therewith. The shaft D has two bevel gears *d*², *d*³, fast on it; one near each end, immediately adjacent to the inner faces of the lower, longitudinal, cutter-frame bars, as shown in Figs. 6 and 7, thereby locating said gears one or the other of which according to the side to which the carrier is made to discharge its load, is made to actuate said

carrier, as far apart as practicable within the frame of the cutting machine.

B is the lower carrier shaft, arranged at right angles to the shaft D and having a bevel gear d^4 , fast on the end adjacent thereto and meshing with the gear d^2 , (or d^3) for actuating said shaft.

The lower end bar of the cutter frame is indicated at 4, and to this is secured a compound box f , composed, preferably, of two parts, as shown in Figs. 6, 9 and 9^a, bolted together at their upper ends to the intermediate end bar 4 and provided at their lower ends with an eye-bearing at f' , through which the shaft B extends loosely, said eye-bearing being enlarged at the end f^2 , to receive the short tubular stud 6 on one of the boot side castings C, in which the shaft B is journaled, while the stud in turn is journaled in the eye-bearing f^2 . The outer side casting of the carrier boot is similarly provided with a sleeve (6) which is journaled in an eye-bearing b' in an upright bracket or stand b , the shaft B passing also through said sleeve and being journaled near its outer end therein. The carrier boot is thus pivotally supported in the brackets b and f and the whole weight of the carrier rests on the pivots on which the angle of the carrier is adjusted, instead of upon the carrier shaft, as heretofore, thereby facilitating such adjustment and relieving wear and friction at that point. The shaft B, immediately adjoining the boot sides C, has sprocket wheels B' fast on it, through which motion is imparted to drive chains passing over pulleys fast on a shaft a , at the upper end of the carrier for actuating the carrier flights, in the usual manner.

The boot side plates C are provided, each, with a semi-annular flange or rib 7, underlying the lower portion of the sprocket wheel adjacent thereto and extended tangentially to the arc of a circle of the curved portion, over the hopper side of said wheels for preventing the cut material from getting into the openings in the bottom board of the carrier for the carrier sprocket wheels or into and clogging said wheels and the chain operated thereby. The preferred form or construction of these boot sides is shown in Figs. 2 and 5, the former showing an outer and the latter an inner side view of the plate. The concave bottom 9 is stiffened by ribs 11 and is provided with lips 12 which engage sockets in the outer edge of the plates C and serve to lock the two parts together, preventing relative movement or displacement. The upper portions of the boot sides above the shaft B are extended to form arms 15, to which the sides C' and bottom C², of the carrier frame are attached, the latter having recesses in its lower end adjacent to its sides similar to those at c^2 (Fig. 4) in its upper end, for the carrier driving sprocket wheels to project through. The sides are further provided at the inner edge of the concave bottom, with offsets in the form of sockets to receive a

cross bar or board, which in connection with long bolts passing from side to side through the holes 14, serve to stiffen the connection of the side plates, the board 13, serving also to form an extension of the front of the hopper resting thereon and an extension of the boot bottom.

The receiving hopper for the boot is composed of the lower ends of the carrier bottom and side boards, fan-shaped or triangular side boards or plates 1, 2, a front board 3, facing the bottom board and a machine end board 5 extending from the lower bar 4 to the upper end bar of the machine frame and cut out on its upper edge to match and fit snugly the discharge spout, indicated by dotted lines in Fig. 1. The fan-shaped boards 1 and 2 are fastened, one (2) to the carrier side and the other (1) to the front hopper board and are arranged to fold or pass, one by the other, as the angle of the carrier is adjusted to different degrees of elevation or for transportation. The hopper board 3 with the fan-shaped board secured thereto is adjustable with the carrier, but resting lightly upon the boot sides C, in sockets c^x , formed therein, and on the board 13 and moving with the carrier frame, when the latter is adjusted, by reason of the frictional contact of the overlapping, fan-shaped, side boards 1 and 2, it can, when desired, be adjusted independently for expanding or contracting the mouth of the hopper, as required. The outward throw or movement of the end board 3 may be limited by any suitable stop on the machine frame.

By locating the carrier actuating shaft low down and at the side of the machine upon which the carrier is arranged to discharge the cut material, it will be apparent that the carrier can be set to much nearer a vertical position than where the shaft is under the ordinary central arrangement, without interference from the extended machine frame, or the overhanging wheels or cutting cylinder, thereby, to that extent, reducing the space required for the carrier attachment.

The upper carriershaft a , is mounted in sleeves in rack bars a' , sliding in suitable guide-ways on the side boards C', and adjusted by toothed segments a^2 , on a shaft a^3 , for regulating the tension of the carrier drive chains, pawls engaging teeth on the rack bars a' for holding them at the desired adjustment. This arrangement is substantially the same as in my former patent, referred to, except that the toothed segment a^2 has a polygonal hub to receive a wrench for effecting the adjustment referred to.

The carrier bottom board C², has a semi-cylindrical guard 10, (see Figs. 5 and 5^a) secured to its lower or receiving end, extending from side to side between the sprocket wheels of the carrier and around in front of and under the shaft B, concentric therewith and with the flange 7. It has a groove or double flange at its upper edge, through which it is bolted to the bottom board and end flanges bearing

on the shaft B for further supporting it, said guard serving to prevent the material from catching on the lower edge of the bottom board and so obstructing the operation of the carrier. It also serves to support the carrier buckets as they pass under the shaft B.

The manner of attaching the flights E to the carrier chains is shown in Figs. 4^a and 4^d.

The chain links *e* to which the buckets are to be attached have laterally projecting arms *e'* forming saddles provided with upturned parallel lips or ears *e²*, *e²*, between which the lower edges of the buckets E fit snugly, being secured in place by through bolts or rivets *e⁴*. To the outer edge of the bucket, a grooved or flanged cap *e³* is secured by a bolt *e⁶*, which passes through the bucket E edgewise and through a perforation in the base *e'* of the saddle. The bolts *e⁶* secure the caps *e³* and buckets E to the saddle and prevent the splitting of the flights at the bolts or rivets *e⁴*. The ends of the buckets overhang the drive chain links but are cut away at *e⁷*, adjacent thereto, to allow them to pass the sprocket wheel guards or curved flanges 7. The lips or flanges *e²*, in connection with the rivets *e⁴*, permit the use of thin, high buckets, the rivets securing the flanges firmly and preventing the splitting of the flights near the chain. By this construction the flights can be made, not only much lighter than those heretofore in use, but they can also be made wider or higher, thereby increasing their carrying capacity, which is important in carriers delivering at a steep or sharp elevation.

The end 16 of the boot at which the buckets E enter, is made flaring, by rounding outward the edge of the sheet metal of which the concave bottom 9 is formed, or in other suitable manner, to facilitate the entrance of the flights and prevent them from coming in contact with said edge.

In Fig. 3, a modification in the construction of the boot is shown, the details thereof being shown in Figs. 3^a, 3^b and 3^c. In this the boot is formed in two parts, the bowl portion, shown at 3^a being provided with foot brackets 17, through which it is secured to the floor or other suitable support, and at 18 with bearing sockets in which are journaled the sleeves 6 on the side plates C, which are secured to the carrier side boards C'. These side plates are provided with the guards or flanges 7 converging and protecting the sprocket wheels, as in the construction first described. In this construction, the bowl portion of the boot remains fixed when the angle of the carrier is adjusted as is found desirable under some locations of the carrier.

In Figs. 10, 10^a and 10^b, another modification of the form of the boot side plates is shown, adapting the boot to the form of the carrier shown in Fig. 10, in which the carrier buckets move in a reverse direction to that shown in the other figures and operate in a pendent position. In this, however, the plate has the curved guard or flange 7 covering the

sprocket wheel, with a supplemental flange 19 extending in an arc of a circle between the two portions of the drive chain for further protecting the sprocket wheel. In this construction the carrier flooring is provided at its upper end with a discharge spout and the carrier frame is provided at its upper end with a hood G, which prevents the throwing off of material which, in the rapid movements of the carrier buckets might fail to be discharged at the spout *g*, and which, if carried around by the bucket, will drop back through the open chain carrier and so be returned to said spout. With the carrier thus arranged, the bevel gears *d²*, *d³*, will be set facing in an opposite direction to that shown in Fig. 6 causing them to drive the carrier in a reverse direction, as required.

In Fig. 2, the carrier is shown applied to carry straight away from the machine and in this the supporting brackets may be bolted directly to the machine, as shown, or they may be formed on the boot as shown in Fig. 3 and bolted to the floor or other support. In this arrangement the driving sprocket wheel instead of being on the counter shaft D, will be placed on the lower carrier shaft and directly connected by a drive chain with the driving sprocket wheel on the cutter cylinder shaft (or other suitable support) as indicated by the dotted lines in Fig. 2.

It is necessary for the discharge spout of the cutting machine and all hopper boards to stand as nearly perpendicular as is practicable for the reason that all material cut green for ensilage, such as corn stalks and ears, sorghum, sugar cane, alfalfa, clover, &c., is so gummy and sticky as to adhere to the discharge spout of the cutter and to the carrier hoppers, if the surfaces are not almost perpendicular. The same is the case with cured cornstalks, leaves, hay and clover when wet with snow or rain, and for this difficulty as well as to secure steep elevation, the low down boot or pocket is desirable. Furthermore, there is a serious difficulty to be overcome by reason of this same wet and sticky cut material adhering to the chain and becoming packed between the teeth of the sprocket wheels, which eventually increases in quantity until the chain slips off the sprocket on one side, permitting the buckets to stand diagonally instead of square across the carrier, producing immediate breaking of the links of the chain.

The advantages of the construction described in overcoming the difficulties referred to, will be apparent. The carrier attachment is rendered more compact than under previous constructions, thereby adapting it to the narrowest or most confined places in which the cutting machine itself can be accommodated; the boot or receptacle for the cut material, with its folding hopper can be readily adapted to any angle to which the carrier is adjusted, and the material being deposited therein in front of the receiving end of the carrier, the

latter can be made to deliver therefrom in a direction more nearly vertical than under the former constructions referred to, in the latter case relieving sag in the inoperative or return portion of the drive chains.

5 Having now described my invention, I claim—

1. A carrier attachment pivoted at its receiving end, in combination with a boot connected with said end and an expanding and contracting hopper for said boot, substantially as described.

2. A carrier attachment, having side plates provided with sleeve pivots journaled in the carrier supporting brackets, in combination with said brackets and with a carrier actuating shaft passing through said brackets and journaled in said sleeves, substantially as described.

3. In a carrier attachment, the endless chains carrying the flights and the sprocket wheels for driving said chains, in combination with the curved guards covering and protecting said wheels, substantially as described.

4. The combination with the carrier and the endless chains and sprocket wheels thereof of the carrier boot provided with the curved or semi-annular flanges, covering and protecting the carrier actuating sprocket wheels, substantially as described.

5. A carrier frame or trough having its bottom provided with recesses for the endless chain sprocket wheels on the carrier shaft in combination with a boot or pocket having a curved or semi-annular flange covering and protecting said sprocket wheels and the openings in the carrier bottom, substantially as described.

6. The combination with the endless carrying chain and the shaft and sprocket therefor, of a carrier frame or trough having recesses in the bottom thereof for said sprocket wheels projecting flanges or shields partially surrounding the sprocket wheels and chain thereon and the openings in the carrier bottom, said flanges being in shape a part circle with one end extended at a tangent from said circle, substantially as described.

7. The combination with the carrier frame or trough adjustable to the desired elevation, of the endless carrying belt therein and the shaft and wheels for said belt, side plates having bearings for said shaft and protecting guards or shields for said wheels and belt, and made adjustable with the carrier frame, substantially as described.

8. The carrier boot sides provided with sleeve bearings for the carrier actuating shaft and with the curved flanges for covering and protecting the carrying chain and sprocket wheels on said shaft, substantially as described.

9. A carrier attachment frame made in the form of a trough and pivoted at its receiving end in combination with the boot and an expansible hopper for said boot connected to its receiving end, wherein the material is de-

posited beyond and below the level of the carrier bottom and the endless carrying belt passing through said boot and trough, substantially as described.

10. A carrier frame having parallel sides and the bottom forming a trough, pivoted and adjustable about its front or lower carrier shaft as a center, and the endless carrying belt thereon, in combination with a receptacle located at the receiving end, and an expansible hopper for said boot adjustable with said frame, substantially as described.

11. An endless carrier frame adjustable on its pivoted end to the desired angle of elevation and provided with a receptacle or boot partially surrounding the receiving end, said boot being adapted to receive the material independently of the carrier bottom, in combination with an expansible hopper for discharging the material into said boot, substantially as described.

12. A carrier frame or trough in combination with an endless carrying chain and buckets, the boot or receptacle partially surrounding the receiving end of the carrier, the boot sides being provided with circular flanges covering and protecting the carrier chain and the sprocket wheels for said chain, the transverse connecting piece 13 and flooring connecting said boot sides and forming therewith the receptacle or boot and permitting the passage through it of the carrying chain and buckets for moving the material therein, substantially as described.

13. An endless carrier frame or trough in combination with a receptacle or boot provided with side plates having curved projecting flanges to protect the gearing and drive chains and the transverse piece 13 and flooring connecting said side plates, substantially as described.

14. An endless carrier frame or trough provided with a pocket or receptacle at the receiving end formed by the curved extension of the bottom board of said trough, the inclosing side plates and the flooring connecting said plates arranged to permit the passage of the endless carrying belt through said receptacle, between said flooring and curved extension, substantially as described.

15. A carrier attachment adapted to be pivoted about the lower carrier shaft of a machine delivering thereto, as a center and located transversely of the machine frame in combination with a counter-shaft for driving said carrier attachment, journaled transversely of the machine frame, the actuating front carrier shaft geared directly to said counter shaft at one side of the center, in width, of the frame of the machine frame and upon the same side of the center as the delivery end of the carrier attachment, substantially as described.

16. The pivoted carrier the actuating shaft of which is located at one side of the center of discharge of the machine delivering there-

to and on the same side thereof as the discharge end of the carrier, in combination with the boot connected with the pivoted end of said carrier, and the expansible hopper delivering thereto, substantially as described.

17. A carrier boot having side plates provided with sleeve pivots, curved flanges for protecting the carrier sprocket wheels and a concave bottom, in combination with a stiffening board 13, forming an extension of said bottom and bolts connecting the side plates, substantially as described.

18. The combination with the carrier and the boot connected with the receiving end thereof, of the curved or semi-cylindrical guard 10, connected with the bottom board, substantially as and for the purpose described.

19. A carrier boot having a concave bottom, the side plates thereof provided with the sprocket wheel guards 7, in combination with the semi-cylindrical guard 10, connected to the carrier bottom board and the receiving hopper, substantially as described.

20. A carrier boot connected to and in combination with the receiving end of a pivoted carrier and the hopper connected therewith provided with the sliding or collapsible side, the adjustable transverse end board (3) and the fixed side plate or piece under the discharge spout of the machine delivering thereto, substantially as described.

21. A carrier attachment adapted to deliver at either side or straight away from the machine delivering thereto, and pivoted concentric with its actuating shaft in combination with a boot connected with said pivoted end and an adjustable or collapsible hopper connected with said boot, substantially as described.

22. The carrier chain links provided with stirrups or lateral extensions having two upright parallel flanges integral therewith, in combination with the flight inserted edgewise between said flanges and the through bolt or rivet uniting said flanges and flight, substantially as described.

23. The carrier chain links provided with stirrups or lateral extensions having upright parallel flanges in combination with the wide flight inserted edgewise between the said

flanges, the bolt or rivet connecting said flanges through the bucket and the bolt or rivet extending through said flight, edgewise thereof, and through the stirrup, substantially as described.

24. The combination with the carrier bucket of the flanged supporting stirrup on the chain link, the flanged washer on the outer edge of said flight, and the bolt or rivet passing through the flight edgewise thereof and connecting said stirrup, bucket and washer, substantially as described.

25. The carrier buckets in combination with the carrier chain links provided with stirrups or lateral extensions having upright parallel flanges and a through bolt for clamping the inner edges of said flights; of flanged washers clamping said flights at their outer edge and a bolt or rivet extending through said stirrup, bucket and washer, substantially as described.

26. The combination with the carrier flights of the carrier belt or chain, having flanged seats for receiving said flights flanged washers overlapping the edges of the flights to prevent the splitting thereof and the rivets or bolts uniting said flanged washers, bucket and carrier belt, substantially as described.

27. The combination with the carrier chains, of the flights E cut away at their ends, adjacent to said chains, the flanged stirrups for receiving said ends and the flanged caps and through bolts for uniting the flight to said stirrups, substantially as described.

28. A carrier attachment provided with a boot or receptacle adjacent to the front or receiving end, in combination with an adjustable hopper adapted to discharge the material into said boot, the lower end of the transverse hopper board resting loosely against said boot and being held in working relation thereby when said hopper is adjusted, substantially as described.

In testimony whereof I have hereunto set my hand this 14th day of August, A. D. 1891.

ELMORE W. ROSS.

Witnesses:

JOHN L. ZIMMERMAN,
JNO. E. MORAN.