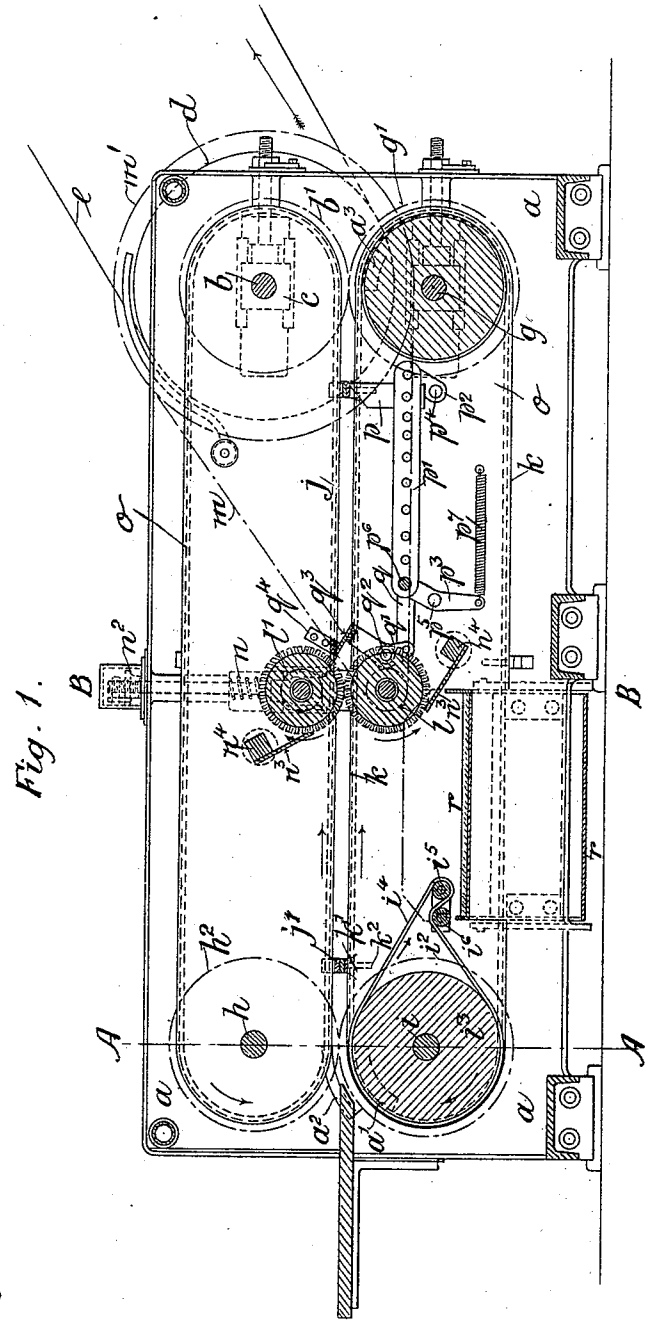
(No Model.) 3 Sheets—Sheet 1.

A. H. COCHRANE.

MACHINE FOR STRIPPING OR REMOVING STEMS FROM TOBACCO LEAVES.

No. 538,660. Patented May 7, 1895.

Fig. 1.



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(No Model.) 3 Sheets—Sheet 2.

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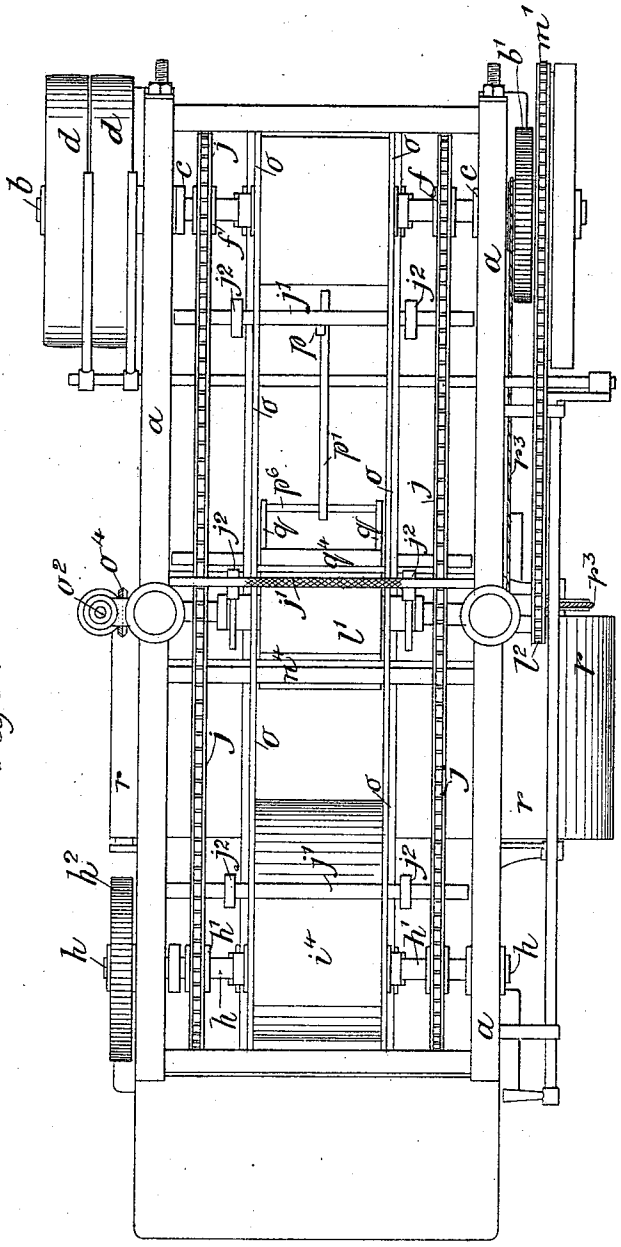
Fig. 2.



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(No Model.) 3 Sheets—Sheet 3.

A. H. COCHRANE.

MACHINE FOR STRIPPING OR REMOVING STEMS FROM TOBACCO LEAVES.

No. 538,660. Patented May 7, 1895.

Fig. 3.

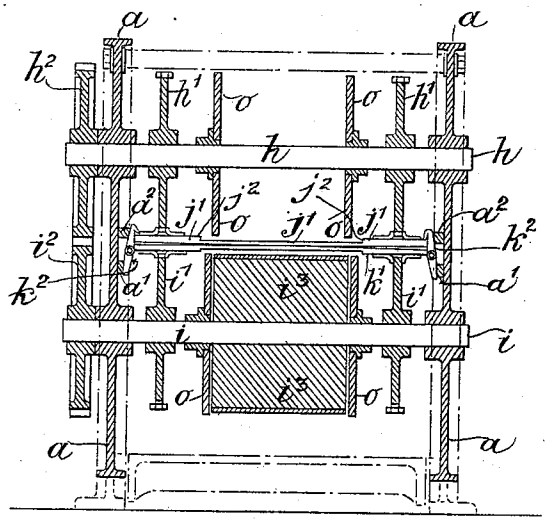
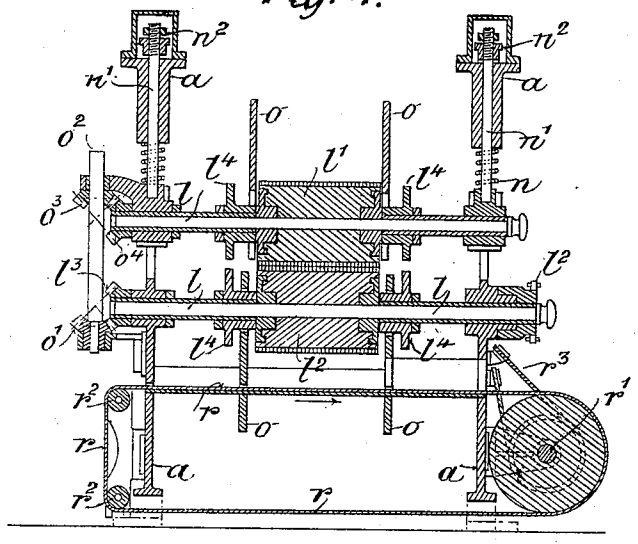


Fig. 4.



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UNITED STATES PATENT OFFICE.

ARTHUR H. COCHRANE, OF LONDON, ENGLAND.

MACHINE FOR STRIPPING OR REMOVING STEMS FROM TOBACCO-LEAVES.

SPECIFICATION forming part of Letters Patent No. 538,660, dated May 7, 1895.

Application filed December 24, 1894. Serial No. 532,899. (No model.) Patented in England January 19, 1894, No. 1,183.

To all whom it may concern:

Be it known that I, ARTHUR HAMILTON COCHRANE, a subject of the Queen of Great Britain, residing at 5 Victoria Street, in the city of Westminster, London, England, have invented certain new and useful Improvements in Machines for Stripping or Removing Stems from Tobacco-Leaves, (for which I have obtained Letters Patent in Great Britain numbered 1,183, bearing date January 19, 1894,) of which the following is a specification.

My invention is not merely designed for chopping off the butts but for stripping the leaves from the stems. This is done by the rollers *l*, *l'* having card clothing which strips the leaves from the stems.

This machine in its simplest form consists of say two pairs of pitch chains which are supported at one end and driven by two pairs of chain wheels geared together. At the other end the chains are supported on guide rollers (or it may be chain wheels) in such a manner that the two pairs of chains travel in an approximately horizontal direction except when passing round the chain wheels or guide rollers. The two pairs of chains are set a convenient distance apart and have carriers attached to them at suitable intervals, the positions of the carriers on the two upper chains corresponding to those on the two lower chains. One set of these carriers, which may be plates or strips of steel or other metal or material, have clips or catches which are actuated by a fixed stop or catch as the chains pass round the guide rollers and thereby cause the carrier on one pair of chains to engage with the corresponding carrier on the other pair. About mid-length of the travel of the chains are mounted a pair of stripping rollers covered with wire card clothing or other suitable material and these rollers I prefer to drive by chains or other means in the opposite direction to that in which the pairs of chains are traveling; and in order that my invention may be fully understood and readily carried into effect I will describe the accompanying sheets of drawings, reference being had to the letters marked thereon.

Figure 1 is a vertical longitudinal section taken about through the center of a machine made according to my invention for stripping or removing the stems from tobacco-leaves. Fig. 2 is a plan view of the machine; and Figs. 3 and 4 are sectional views taken, respectively, on the lines A A and B B of Fig. 1.

In the views,—*a a* are the side frames of the machine, and *b* is the driven shaft mounted in adjustable bearings *c* fitted to be adjusted in the frame *a*. On the shaft *b* are mounted a pair of fast and loose pulleys *d d* for the driving belt *e* and a pair of chain wheels *f f*, also a spur wheel *b'* which gears into a wheel *g'* and gives motion to a shaft *g* immediately below the shaft *b* and on the shaft *g* are fixed two chain wheels.

At the front end of the machine are two shafts *h* and *i* corresponding in position to the shafts *b* and *g* respectively and on each of which is keyed a pair of chain wheels *h'* and *i'*, the chain wheels *f f* and *h' h'* being connected by a pair of chains *j* while the lower wheels *i' i'* and those on the shaft *g* are connected by two similar chains *k*. To each pair of upper and lower chains *j* and *k* are secured say three transverse bars *j'* and *k'* respectively placed at equal and corresponding distances apart on the two pairs of chains.

On each end of each lower bar *k'* is pivoted a catch k^2 which is actuated by stationary cams *a'* a^2 a^3 as follows:—Just before each pair of transverse bars *j' k'* meet at the feed end of the machine the lower ends of the catches k^2 on the bar *k'* meet the cams *a'* and are pushed back thereby withdrawing their upper hooked ends out of the way of the bar *j'*. Then as the bar *j'* comes over and meets the bar *k'* it is clipped and locked by the hooked ends of the catches k^2 which are closed as the upper ends meet the cams a^2 and the chains travel forward with this pair of bars *j' k'* locked together as shown in Fig. 3 until the lower ends of the catches k^2 meet the cams a^3 at the driving end of the machine whereby the hooked ends of the catches are withdrawn and the pair of bars *j' k'* are unlocked. In order to insure the transverse bars *j'* and *k'* meeting correctly, the shafts *h* and *i* are geared together by spur wheels h^2 i^2. Near the middle of the machine are fitted a pair of rollers *l l'* covered with wire card clothing or other suitable material having like characteristics. The lower roller *l* is

driven by a chain m which passes over a wheel l^2 on its axle from a chain wheel m' on the shaft b. The upper roller l' is fitted in blocks arranged to slide in slots in the frames a and held down by springs n or screwed rods n' or by dead weights and the position of the roller l' can be regulated by the nuts n^2 on the rods n' which are secured to the bearings of said roller.

In order to raise the upper roller, smoothly, projections j^2 are secured to the bars j', see Fig. 2, and similar projections are secured to the bars k'. These projections come between bowls l^4 on the axles of the rollers $l\,l'$ and thereby raise the roller l'. The rollers $l\,l'$ have preferably strippers such as pieces of leather n^3 secured to transverse bars n^4, or combs or separate stripping rollers might be employed to clear the rollers $l\,l'$. To drive the upper roller l' I fit upon the shaft of the lower roller l a bevel pinion l^3 which gears into a pinion o' keyed upon a vertical shaft o^2 to the upper end of which is fitted on a feather key a bevel pinion o^3 which gears into a pinion o^4 keyed upon the shaft of the upper roller l', and as the upper bearing of the shaft o^2 is formed with the bearing of the roller l', the roller is free to be raised and lowered without affecting its gearing. On each side of these rollers are fitted partition plates $o\,o$ which are supported partially by bosses fitted on the four chain wheel shafts and to these partitions is connected a frame work which consists of a plate p secured in any required position to a bar p' mounted on links $p^2\,p^3$ pivoted at $p^4\,p^5$ to the partition o. The bar p' has a rod p^6 secured to it and to the ends of this rod are pivoted two links q, the other ends of which are connected to a knife carrier or frame q' pivoted on studs q^2 carried by the partition o. The frame q' carries a cutting blade q^3 between which and a stationary rest q^4 the tobacco leaf passes while the knife and its frame q' are in their normal positions, that is to say, drawn back by a spring p^7 attached to the link p^3. When a transverse bar k' comes over and upon the plate p it depresses it and causes the bar p' carried by the links $p^2\,p^3$ to move toward the driving end of the machine the links q and frame q' with the cutting blade q^3 being thereby brought sharply against the stem and so cutting it off against the fixed rest q^4.

By adjusting the position of the plate p on the bar p' the knife q^3 can be caused to cut off any desired length of stem from the leaf—that is to say, the rollers l, l' strip the leaf from the stem from the butt nearly or quite to the top of the leaf and the knife acts to insure the complete separation of the stem from the top of the leaf and this point of severing may be changed as desired.

On the shaft i is secured a roller i^3 round which is placed an apron i^4 which passes over a roller i^5 and tension roller i^6. Below the roller i^5 is a transverse apron r which may have strips of card clothing on it and passes over a roller on a shaft r' and small guide rollers $r^2\,r^2$ and is driven by a band r^3 from a pulley on the driving shaft.

In case any leaf is thrown back too far it is caught by the apron i^4 and by it deposited on the apron r. As soon as the jaws with the leaf meet the plate p they move it and the bar p' rapidly back and overcoming the spring q^3 by which the knife had been held in its lowest position cause the knife q' to strike its rest q^2 and cut or divide the stem which will be thrown with the leaf on to the apron r by the rollers $l\,l'$.

In operation the stalk of a tobacco leaf is introduced between a pair of the carriers j' k', just prior to the interlocking or engagement caused by the catches k^2 being first opened by the stationary cams a' and then closed on the upper bars j' by the cams a^2 and to prevent any possibility of the stem slipping I prefer to flute, corrugate or roughen the contiguous surfaces of the carriers j' k', as indicated in Fig. 2, so as to give them a good grip of the stem. The leaf is then taken forward by the travel of the carriers j' k' to the rotating stripping rollers $l\,l'$ by which the leaf is removed in good condition from the stem and falls down on to the traveling apron r by which it is carried to the side of the machine and into a box or receptacle placed below, and as the carriers j' k' pass between the stripping rollers $l\,l'$ the upper stripping roller l' is lifted in its open bearings or guides as described by the projections on the bars j' and k' engaging the loose bowls l^4 on the shafts of the rollers $l\,l'$. After the stripping operation the stem is carried forward to the chain wheels on the shafts b and g where the carriers j' k' are unlocked by the stationary cams a^3 releasing the catches k^2 and so releasing the stem, which falls down into another box or receptacle below while the chains $j\,k$ continue to travel over the chain wheels.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim, and desire to secure by Letters Patent of the United States, is—

1. In combination in a stemming machine, the stripping rollers, the pair of carriers each having a cross clamping bar or holder and the automatic catch for holding or releasing the said clamping bars and the cams for controlling the catches.

2. In combination in a stemming machine, the stripping rollers, the carriers for conveying the leaves to the stripping rollers and the knife operating in conjunction with the rollers and arranged to separate the stem after the stripping rollers have acted on the leaf, substantially as described.

3. In combination in a stemming machine, the stripping rollers arranged to have separating movement, the carriers for conveying the leaves thereto and the clamping means on the carriers for the stems, the said rollers be-

ing arranged to separate as the clamps with the stems pass between, substantially as described.

4. In combination in a stemming machine, the stripping rollers, the carriers and the knife arranged to sever the stems and adjustable operating mechanism for the knife whereby it may be set to cut shorter or longer stems, substantially as described.

5. In combination in a stemming machine, the stripping rollers, the carriers, the knife and the operating mechanism arranged to be actuated by the movement of the carrier, substantially as described.

6. In combination in a stemming machine, the stripping rollers, the carrier chains having the clamps and the knife with operating mechanism therefor arranged to be actuated by contact with the clamps, substantially as described.

In witness whereof I have hereunto set my hand in presence of two witnesses.

A. H. COCHRANE.

Witnesses:
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F. W. REELY.