(No Model.)

3 Sheets—Sheet 1.

C. C. STUART.

BELT TIGHTENER.

No. 548,404. Patented Oct. 22, 1895.

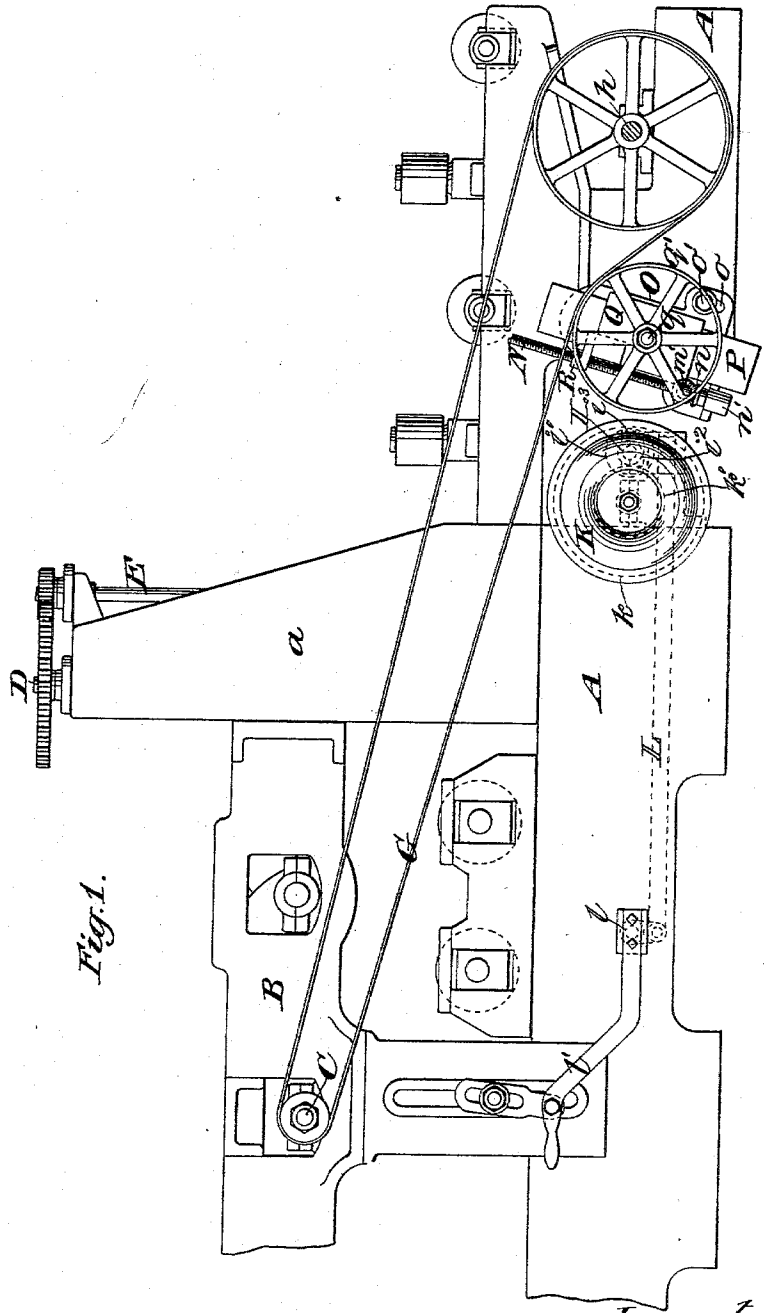

Fig. 1.

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George Barry.

Inventor:
Charles C. Stuart
by attorneys
Brown & Seward

(No Model.)

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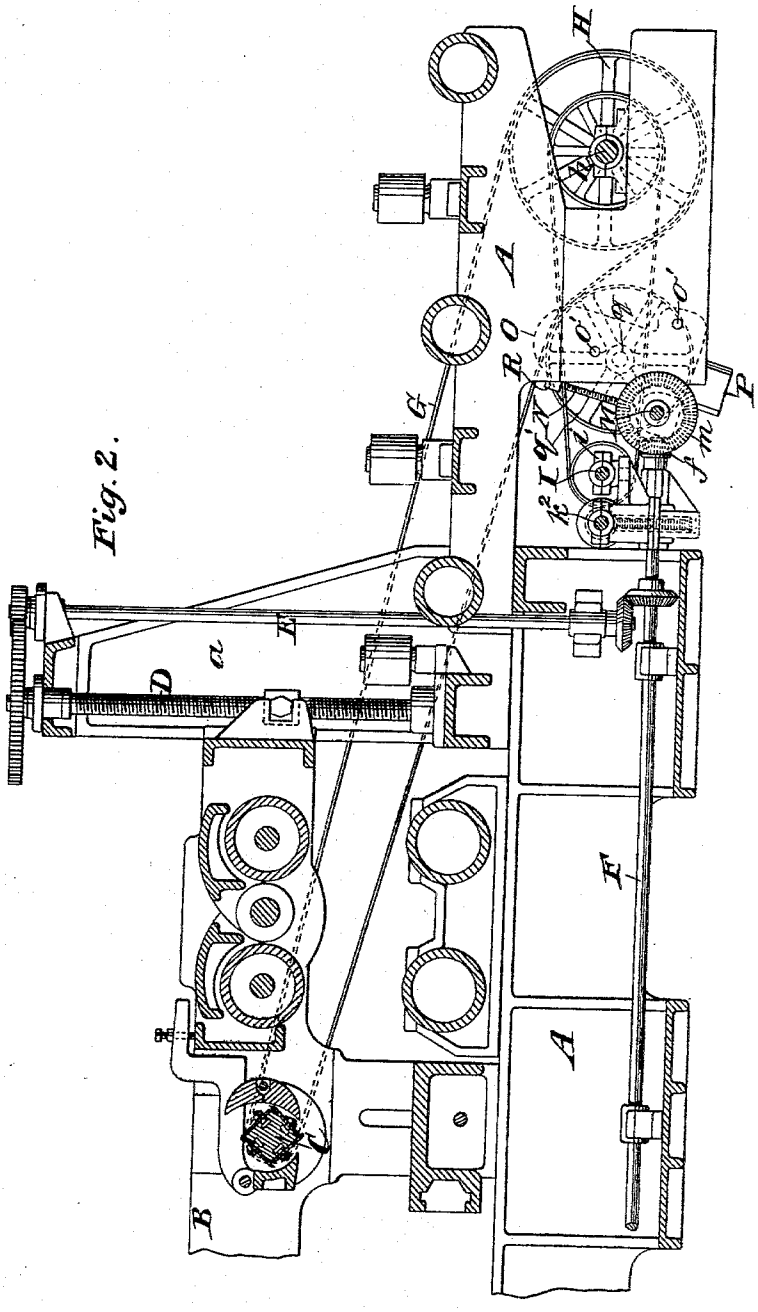
Fig. 2.



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(No Model.) 3 Sheets—Sheet 3.

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BELT TIGHTENER.

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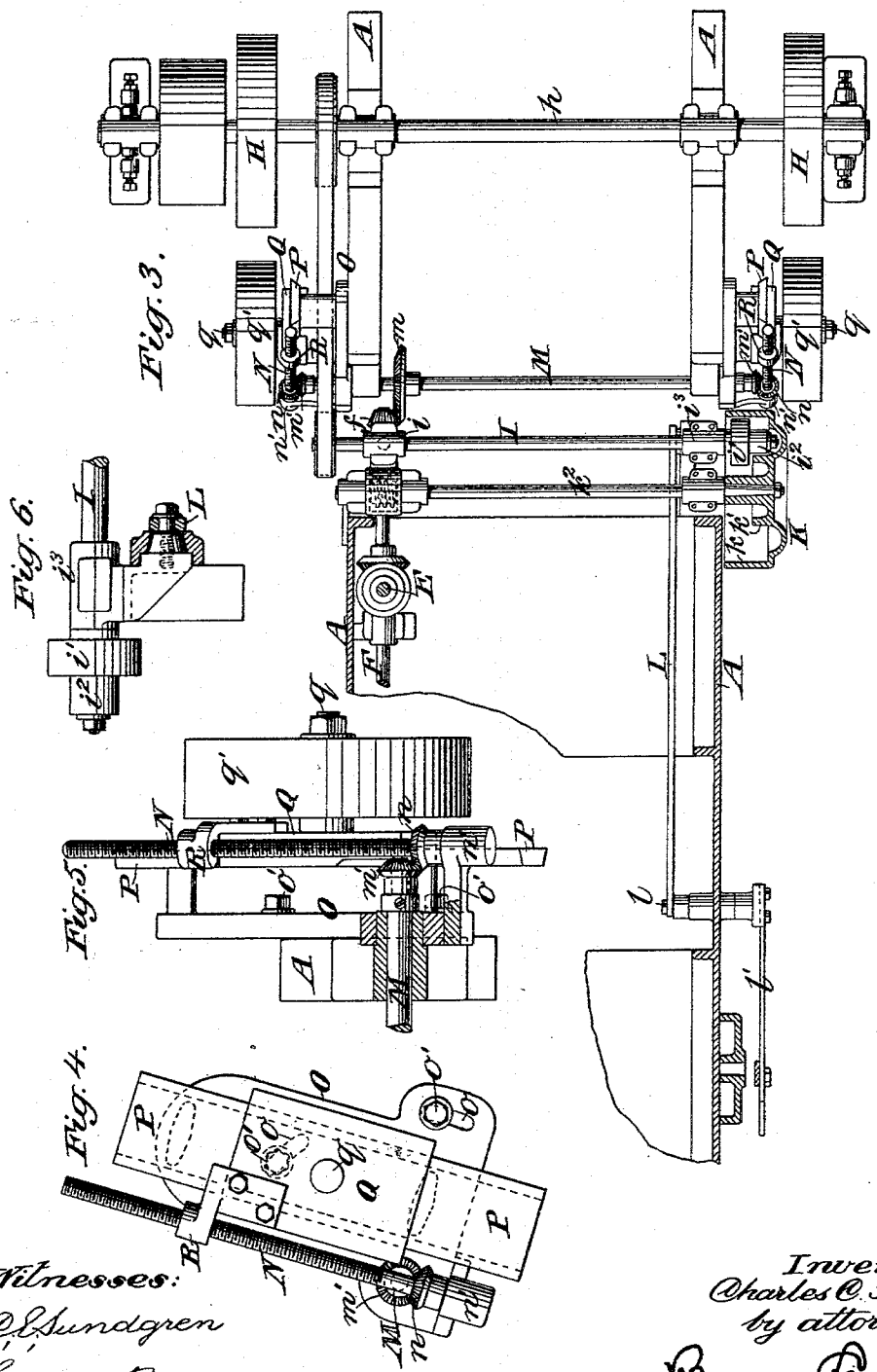

Fig. 3.

Fig. 6.

Fig. 5.

Fig. 4.

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UNITED STATES PATENT OFFICE.

CHARLES C. STUART, OF BROOKLYN, NEW YORK, ASSIGNOR TO THE GLEN COVE MACHINE COMPANY, LIMITED, OF SAME PLACE.

BELT-TIGHTENER.

SPECIFICATION forming part of Letters Patent No. 548,404, dated October 22, 1895.

Application filed March 23, 1894. Serial No. 504,764. (No model.)

To all whom it may concern:

Be it known that I, CHARLES C. STUART, of Brooklyn, in the county of Kings and State of New York, have invented a new and useful Improvement in Belt-Tightening Mechanism for Surfacing-Machines, of which the following is a specification.

My invention relates to an improvement in belt-tightening mechanism for surfacing-machines, in which a cutter-head located in an adjustable frame is driven by a belt from a driving-pulley located on a support independent of the adjustable frame.

The object is to provide means for setting and automatically maintaining the belt at the tension to which it has been set during the various adjustments of the cutter-head-carrying frame.

A practical embodiment of my invention is represented in the accompanying drawings, in which—

Figure 1 is a view in side elevation of so much of a surfacing-machine as will suffice to show the practical operation of the belt adjusting and tightening mechanism. Fig. 2 is a vertical longitudinal section through the same. Fig. 3 is a horizontal section showing the operating mechanism for tightening the belt in top plan, and Figs. 4, 5, and 6 are enlarged views in detail of parts of the belt-tightening mechanism.

The bed-frame of the machine is denoted by A.

a represents the end frame uprising from the bed frame A and serving, in conjunction with a corresponding end frame, (not shown) to form guides for the vertically-movable upper frame B, which carries the top feed-rollers and the upper cutter-head C. The frame *a* also serves as a support for two of the four similar screws D, located one at each corner of the vertically-movable frame B, for the purpose of adjusting it toward and away from the bed-frame A to suit lumber and timber of varying thicknesses. The screws D are operated by means of vertical shafts E, geared with gear-wheels on the screws, the shafts E being driven by a horizontal shaft F, geared with the shafts E by miter-gear.

The belt G, which drives the cutter-head C in the vertically-adjustable upper frame, extends from and is driven by a drive-pulley H, mounted in the lower frame A. It is to the tightening and maintaining the tension of the drive-belt G under the various adjustments of the frame B that my present invention is more particularly directed. To accomplish this, it is obviously necessary that the tightening and loosening of the belt shall correspond with the movement of the adjustable frame B, which tends to decrease or increase the tension on the belt, and I have therefore placed the belt tightening and loosening mechanism under the control of the particular mechanism which is employed to elevate and lower the said upper frame.

A transverse shaft I, continuously driven from the shaft *h*, on which the drive-pulleys H are fixed, is journaled near one end in a horizontally-rocking bearing *i*, and is provided at its opposite end with friction-pulleys *i'* and i^2 for engaging either the interior face *k* of a friction-pulley K or the exterior surface of the inner rim *k'* on the said pulley K to rotate said pulley K in the one direction or the other, as may be desired. The shaft I is swung to bring its friction-pulleys into engagement with the inner or outer portions of said pulley K by means of a rod L, connected to a sliding bearing i^3 of said shaft I, and also to a rock-shaft *l* under the control of a hand-lever *l'*. The shaft k^2, on which the pulley K is fixed, gears with the shaft F for operating the upright shafts E, and hence the screw D, to adjust the frame B. The shaft F projects past the shaft k^2 and is provided with a bevel-gear *f*, in mesh with a corresponding gear *m* on a transverse shaft M, mounted in suitable bearings in the bed-frame. At its opposite ends the shaft M is provided with bevel-gears *m'*, arranged to mesh with corresponding gears *n* on screws N, held at their lower ends in suitable bearings *n'*, so as to permit them to rotate freely without themselves advancing longitudinally. The bearings *n'* are fixed to rocking frames O, hinged on the shaft M and provided with elongated slots *o*, through which clamp-screws *o'* extend into the bed-frame to hold the rocking supporting-frame O in the desired rocked adjustment. Fixed to the face of the frame O is a way or tongue-

piece P, on which a slide Q is arranged to travel. The slide Q is provided with a pivot q, on which a loose belt-tightening pulley q' is mounted. The rocking frames O and the parts which they carry are quite similar upon opposite sides of the machine, as clearly indicated in Fig. 3.

The screws N engage in nuts R, fixed to the slides Q, so that as the screws N are rotated in the one direction or the other the nuts R, and hence the slides Q, to which they are fixed, and the pulleys q', carried by the slides, will be caused to travel along the way or tongue P in the one direction or the other to take up or let out the belt G.

In operation the belt G is first adjusted to the desired tension by rocking the frame O on the shaft M to increase or decrease the tension on the belt, and after this adjustment is obtained the tension will be automatically maintained by the operation of the screws N, under the control of the mechanism which actuates the movable upper frame to vary its adjustment relatively to the lower frame—*i. e.*, when the shaft I is drawn into position to rotate the pulley K in a direction to move the upper frame away from the lower frame, and hence increase the tension upon the belt G, the shaft F will at the same time rotate the shaft M, and hence the screws N, in a direction to lower the tension-pulleys q', and hence slackening the belt G, the amount of slackening being exactly proportioned to the amount of take-up caused by the elevation of the upper frame. When, on the other hand, the shaft I is moved in a direction to actuate the pulley K to lower the upper frame, it will impart to the screws N the reverse movement, and hence will force the tightening-pulleys q' toward the belt G to take up just that amount which is slackened by the lowering of said upper frame.

At any time when the belt becomes stretched, so that the normal tension is less than what is desired, the proper tension to be maintained may be at once obtained by rocking the frames O in the one direction or the other, as hereinabove set forth.

It is obvious that slight changes might be resorted to in the form and arrangement of the several parts without departing from the spirit and scope of my invention, the broad feature of which consists in providing for the control of the belt-tightening mechanism by the mechanism which actuates the upper cutter-head-carrying frame. Hence I do not wish to limit myself strictly to the structure and arrangement herein shown and described; but

What I claim is—

1. The combination with an adjustable upper frame, means for actuating it, a cutter carried by said frame, a driving pulley mounted independently of said cutter carrying frame and a belt connecting said driving pulley with said cutter spindle, of a rocking frame and belt tightening mechanism carried by said rocking frame and under the control of the movable frame actuating mechanism to maintain a uniform tension upon the belt during the movements of said upper frame, substantially as set forth.

2. The combination with a vertically adjustable upper frame, the cutter carried thereby, the lower frame, a driving pulley mounted therein and a belt connecting said driving pulley and cutter spindle, of mechanism for adjusting the upper frame including a shaft extending along the bed frame, a slide carrying a belt tightening pulley, a screw for operating the slide and gear under the control of said shaft, extending along the bed frame, for operating said screw, substantially as set forth.

3. The combination, with a lower frame, the drive pulley, the adjustable upper frame, the cutter carried thereby, and the belt connecting the drive pulley with said cutter spindle, of mechanism for adjusting the upper frame, said mechanism comprising a shaft extending along the bed frame, a transverse shaft in gear with said shaft extending along the bed frame, a slide carrying a belt tightening pulley and mounted to move toward and away from the belt, a screw engaged with said slide and gear connecting said transverse shaft with the screw, substantially as set forth.

4. The combination with a movable upper frame, the rotary part carried thereby, the drive pulley and the belt connecting said rotary part with the driving pulley, of mechanism for actuating the upper frame, a rocking frame, a slide carrying a belt tightening pulley and mounted on said rocking frame and mechanism for moving the said pulley-carrying slide under the control of the upper frame actuating mechanism, substantially as set forth.

5. The combination with the driving belt, of a transverse shaft, a rocking frame hinged on said shaft, means for locking the frame in a desired rocked adjustment, a slide mounted on said rocking frame and carrying a belt-tightening pulley, mechanism connecting the transverse shaft and slide for adjusting the slide along the support and means for actuating the shaft, substantially as set forth.

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Witnesses:

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FREDK. HAYNES.