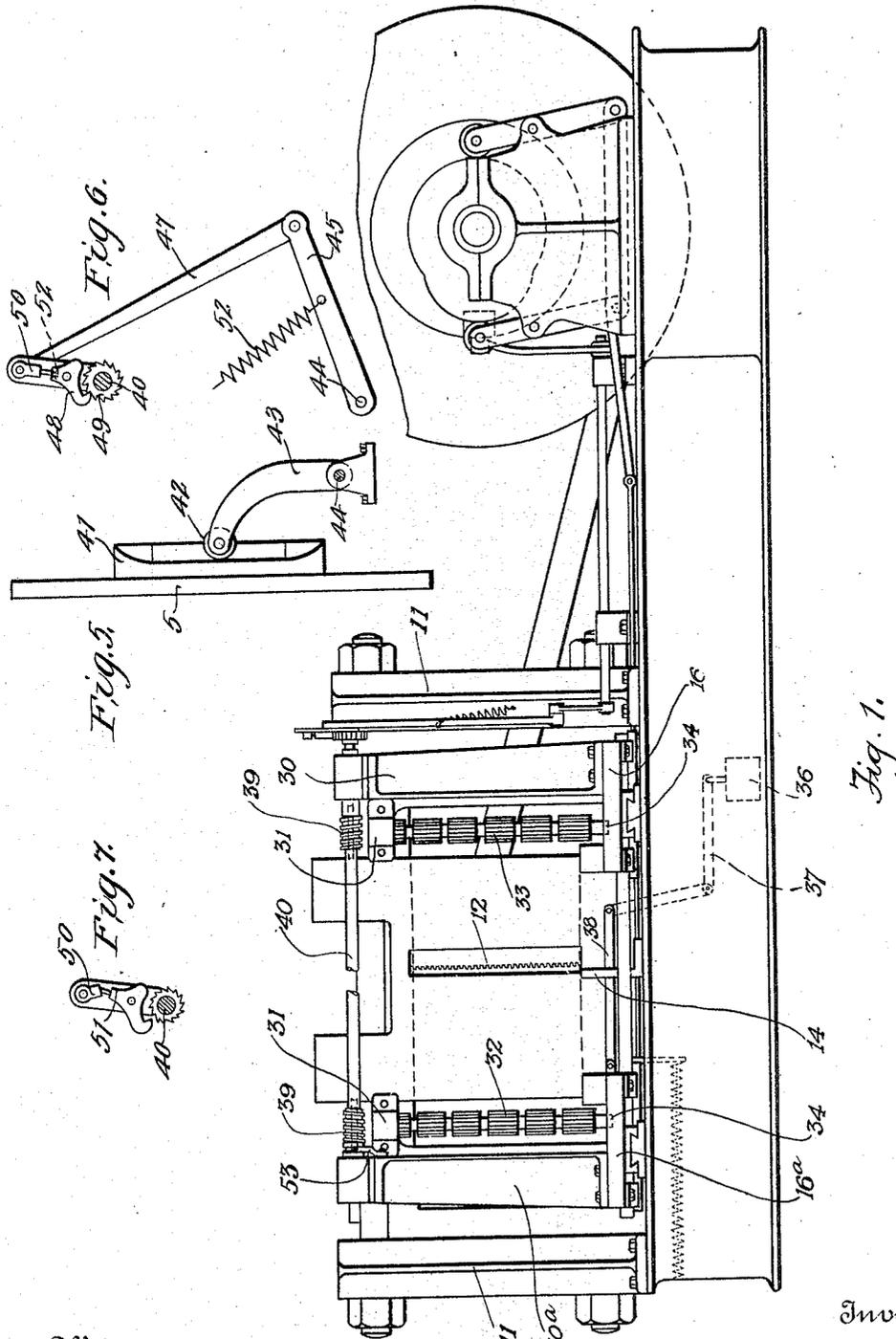


1,237,378.



Witnesses

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 Fred J. Howard

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FRANK H. PHILLIPS

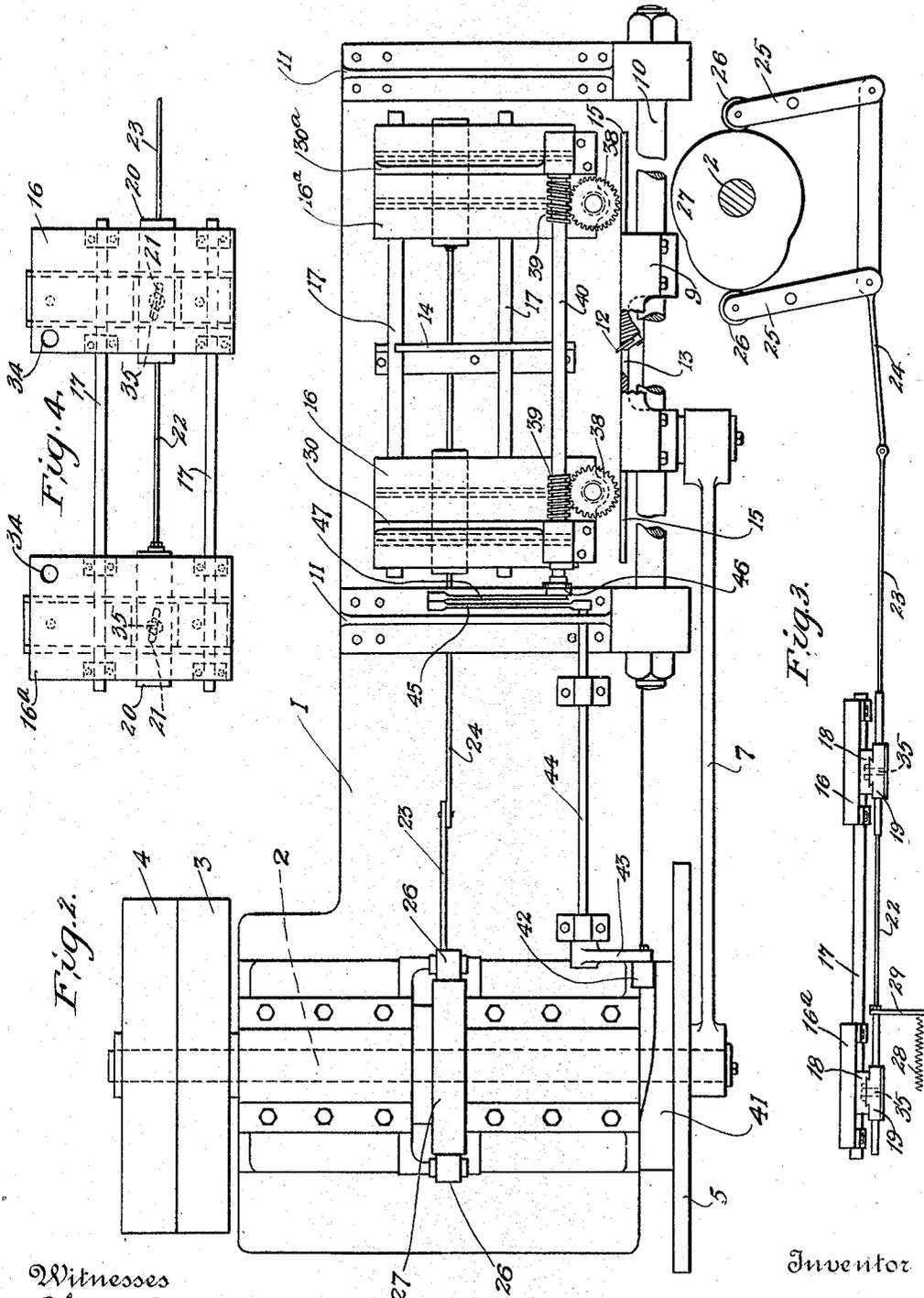
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Patented Aug. 21, 1917.

2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

FRANK H. PHILLIPS, OF CLEVELAND, TENNESSEE, ASSIGNOR TO GEORGE D. ANDREWS.

EXCELSIOR-MACHINE.

1,237,378.

Specification of Letters Patent.

Patented Aug. 21, 1917.

Application filed March 22, 1915. Serial No. 16,140.

To all whom it may concern:

Be it known that I, FRANK H. PHILLIPS, a citizen of the United States, residing at Cleveland, in the county of Bradley, State of Tennessee, have invented certain new and useful Improvements in Excelsior-Machines, of which the following is a specification.

My invention relates to an excelsior machine and has as its principal object the provision of a machine in which the knife is clear of the log operated upon during the return or idle stroke of the machine.

A further object of my invention resides in the particular arrangement and combination of parts hereinafter described.

In the accompanying drawings:

Figure 1 is a side elevation of the machine.

Fig. 2 is top plan view of the device shown in Fig. 1.

Fig. 3 is a detail view in elevation showing the means for embodying movement to the feed table.

Fig. 4 is a plan view of a portion of the apparatus shown in Fig. 3.

Fig. 5 is a detail elevational view showing the cam and arm for operating the feed levers.

Fig. 6 is a detail of the feed shaft and levers.

Fig. 7 is a detail showing how the feed can be thrown out of operation.

Throughout the separate views the same part is designated by the same reference character.

Referring more particularly to the drawings, 1 is a bed on which is journaled a shaft 2 which may be driven in any convenient manner, but which is shown as driven by a pulley 3, a loose pulley 4 being provided for convenience. On the end of the shaft 2 opposite the pulley 3 is a crank disk 5 carrying a pin 6 which is pivoted to one end of the link or pitman 7, the other end of the pitman being pivoted to a pin 8 which is fixed to the cutting head 9. It will be seen that the head 9 is arranged to reciprocate on rods such as 10 which are fastened at one side of the bed 1 to standards or housings such as 11, the housings being fixed to the bed 1. It will, moreover, appear from Fig. 1 that the cutting head 8 carries a knife 12 of a kind in ordinary use in excelsior machines, and the head is provided with a slot 13 through which the

shavings may escape to the outside of the head. It will be understood that the log or block to be operated on is introduced into the machine between the standards 11 from the side opposite the knife 12 and I provide an angle iron 14 for supporting the weight of the block while it is being operated on by the knife and being fed by mechanism hereinafter described. In order to prevent the block from moving too far toward the side of the cutting head 8 when it is being placed in the machine I provide short plates 15-15 which are carried by the head 9 on the inner side thereof.

Now I provide an arrangement not only for giving the log a gradual feed toward the knife, but also for moving the log away from the knife on the back stroke of the knife. With these objects in view I provide a table comprising horizontal plates 16^a and 16 united by rods such as 17, which are let into sockets or recesses in the upper faces of blocks such as 18, plate 16^a being loose on the rods 17 and plate 16 being clamped to the rods 17. On their under-side the plates 16^a and 16 rest on, but are not directly connected with, the blocks 18 which have dove-tailed engagement with guides 19 fixed to the base 1 and which extend at right angles to the motion of the knife 12. Now the guides 19 are broken away at one point so as to receive reciprocating blocks such as 20, each of which is provided with a pin 35, the blocks 20 being arranged to reciprocate parallel to the knife 12 and the blocks 18 being provided with slots 21 oblique to the direction of reciprocation of the blocks 20 into which the pins project. Thus the reciprocation of the blocks 20 will move plates 16 toward and away from the knife. It will be seen that the blocks 20 are connected together by link 22 so as to move together and the blocks are operated by a link 23 which connects to a link 24, the last link being operated by levers such as 25 which carry rollers 26 in operative engagement with the cam 27 fixed on the shaft 2. As shown in Fig. 3 I provide also a spring 28 which is connected by an arm 29 to the link 22, the spring 28 serving to pull the block 20 in the same direction as one of the levers 25. It will be evident that, if desired, one of the levers 25 and rollers 26 may be omitted. Now the plates 16^a and 16 carry upright flanges or standards 30^a and 30 respectively and at the ends near

the cutting head, the standards 30^a and 30 are enlarged transversely of the plates 16^a and 16 as clearly shown in Fig. 1, to provide bearings 31 for vertical feed rollers such as 32 and 33, the lower ends of the rollers 32 and 33 being received in sockets 34 in the plates 16^a and 16 respectively, it being understood that plate 16 is fixed, but that plate 16^a may move longitudinally on the rods 17. From the foregoing it will be apparent that the logs can be fed toward the knife by rotating the rollers 32—33 in the proper direction and, moreover, the log can be moved back away from the knife by giving a reciprocating motion to the plates 16^a and 16. The plates are operated by the blocks 20 previously mentioned through instrumentality of pins 35 previously mentioned in the blocks 20, the blocks 20 being moved by the cam 27.

Now, as previously mentioned, the plate 16^a is slidable on the rod 17 and this is for the purpose of permitting the standard 30^a, carried by the plate 16^a, to be moved transversely of the carrier to permit a block of wood to be inserted between the rollers and I provide a weight 36 which connects with the movable standard 30^a carrying the roller 32 through link 37 and 38 in such manner that the roller is normally thrown into engagement with the block. In order to operate the rollers 32 and 33 I provide gears such as 38 at the upper ends of the rollers which connect with worms 39 carried by a shaft 40 suitably journaled at the top of the standards 30. Means for properly rotating the shaft 40 in order to feed the block toward the knife is shown in detail in Figs. 5, 6 and 7 and appears also on Figs. 1 and 2. Such operating means comprises a cam 41 on the shaft 2 immediately adjacent the crank disk 5. In operative contact with the working face of the cam 41 is a roller 42 which is pivoted on a lever arm 43, the arm 43 being arranged to work in a plane at right angles to the plane of rotation of the cam 41 on shaft 2. The arm 43 is fixed to a shaft 44 the other end of which carries an arm 45 which serves to operate the shaft 40 by means of a pawl and ratchet motion comprising an arm 46 loose on the shaft 40 which connects with the arm 45 by means of a link 47. Carried on the arm 46 is a pawl 48 which operates in conjunction with a ratchet wheel 49 in the usual manner. I provide, however, means whereby the pawl 48 may be thrown out of operation which comprises a pin 50 pivoted to the arm 46 which extends into a recess in the projection 51 on the pawl member 48. I provide also a spring 52 in the said recess and it will be seen that the pivot points of the members 48 and 50 are so arranged that the spring normally tends to throw the pawl into engagement with the

wheel 49. However, if the members 48 and 50 are pushed to one side so that the extension 51 is no longer in alinement with the pin 50, then the spring serves to hold the pawl 48 away from the ratchet. It will be seen, moreover, that I provide a spring 52 which serves to operate the arm 45 in a direction contrary to the cam 41. From the foregoing it will be understood that the revolution of the cam 41 serves to revolve the rollers 32 and 33 so as to feed toward the block or log against the knife 12.

As previously stated, moreover, the standard 30^a and plate 16^a which are associated with the roller 32 are movable on the rods 17 but that the shaft 40 is fixed with respect to the standard 30, so far as longitudinal movement is concerned. Consequently I make the worm 39 which is associated with the feed roller 32 slidable longitudinally of the shaft 40, the two being connected by a key or spline, and hold the worm 39 in proper position relatively to the corresponding wheel 38 by means of a finger 53 which fits in a groove formed by a collar fixed to the worm 39 and which is also fastened to the corresponding standard.

Considering now the operation of the machine as a whole, it will be understood that the cutting head 9 which carries the knife 12 is reciprocated by the crank disk 5 in a manner previously described. As the knife moves toward the right in Fig. 1 the blocks 20 are placed in such position by the cam 27 and spring 28 and associated mechanism that the plates 16 are advanced toward the knife and the knife cuts a series of shavings from the block or log. As the knife makes its return stroke the blocks 20 are moved so as to throw the plates 16 back away from the knife, so that the knife makes its return stroke entirely free from the log. I find that this feature of returning the knife free of the block not only greatly prolongs the life of the knife, but also eliminates about ninety per cent. of the trouble which has heretofore been encountered with the reciprocating type of excelsior machines. At the same time that the knife makes its return stroke and the plates 16 are moved away from the knife, the cam 41 operates the arm 45 so as to draw the same into its normal position. However, as the plates are moving rapidly at this time no operation of the feed rollers 32 and 33 occurs until the plates 16 are moved toward the knife again. As soon as this happens the arm 46 is moved so as to turn the ratchet wheel 49 whereupon the cam 41 releases the arm 45 and the springs throw the same forward again. Thus the log is pressed forward at the time the plates 16 are moved forward and a fresh cutting surface is presented to the knife for the next cutting stroke.

It will be understood that the machine

specifically described herein embodies the preferred form of my invention, but there are modifications and re-arrangements thereof that may be made as will be apparent to those skilled in the mechanical art, and I contemplate as being within the spirit of my invention all such re-arrangements and modifications as are mechanically equivalent to the device described herein.

10 Having thus described my invention, I claim:

1. In an excelsior machine in combination, a horizontal reciprocating head, a vertical knife carried by said head, a movable carrier for holding a block to be operated on, and means in addition to said carrier for feeding the block toward the knife, said means being supported by said carrier, and means for reciprocating the knife comprising a shaft and a pitman operated by said shaft, said independent feeding means comprising a cam mounted on said shaft, a pawl and ratchet mechanism mounted on said carrier, an arm mounted to move in a plane at right angles to the plane of rotation of said cam, a shaft fixed to said arm, a second arm mounted to move parallel to first mentioned arm fixed to the other end of said shaft, and a link connecting said last mentioned arm to said pawl and ratchet mechanism.

2. In an excelsior machine in combination, a main driven shaft, a knife, connections between said shaft and knife for reciprocating the knife in a plane at right angles to the shaft, a carrier for a block to be operated on, said carrier being mounted to move toward and away from the plane of the knife, blocks mounted to move in a plane parallel to the plane of the knife, operative connections between said blocks and said carrier whereby the carrier is moved toward and away from the plane of the knife at each cutting and return stroke thereof, a cam carried by said shaft for operating said blocks, and means for operating said blocks from said cam.

3. In an excelsior machine in combination, a main driven shaft, a knife, connections between said shaft and knife for reciprocating the knife in a plane at right angles to the shaft, a carrier for a block to be operated on, said carrier being mounted to move toward and away from the plane of the knife, blocks mounted to move in a plane parallel to the plane of the knife, operative connections between said blocks and said carrier whereby the carrier is moved toward and away from the plane of the knife at each cutting and return stroke thereof, a cam carried by said shaft for operating said blocks, means for operating said blocks from said cam, feeding means mounted on said carrier for feeding the blocks toward the plane of the knife, a second cam on said shaft, and connections between said cam and said feeding means, said feeding means remaining stationary as the carrier is drawn away from the plane of the knife and feeding forward under combined action of said second mentioned cam and the forward movement of the carrier as the carrier moves toward the plane of the knife.

4. In an excelsior machine in combination, a main driven shaft, a knife, connections between said shaft and knife for reciprocating the knife in a plane at right angles to the shaft, a carrier for a block to be operated on, said carrier being mounted to move toward and away from the plane of the knife, blocks mounted to move in a plane parallel to the plane of the knife, operative connections between said blocks and said carrier whereby the carrier is moved toward and away from the plane of the knife at each cutting and return stroke thereof, a cam carried by said shaft for operating said blocks, and means for operating said blocks from said cam, said connections comprising pins on one part, and slots in the other part engaging said pins and set at an angle to the movement of the carrier.

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

FRANK H. PHILLIPS.

Witnesses:

JAS. U. JONES,
FRED J. HOWARD.