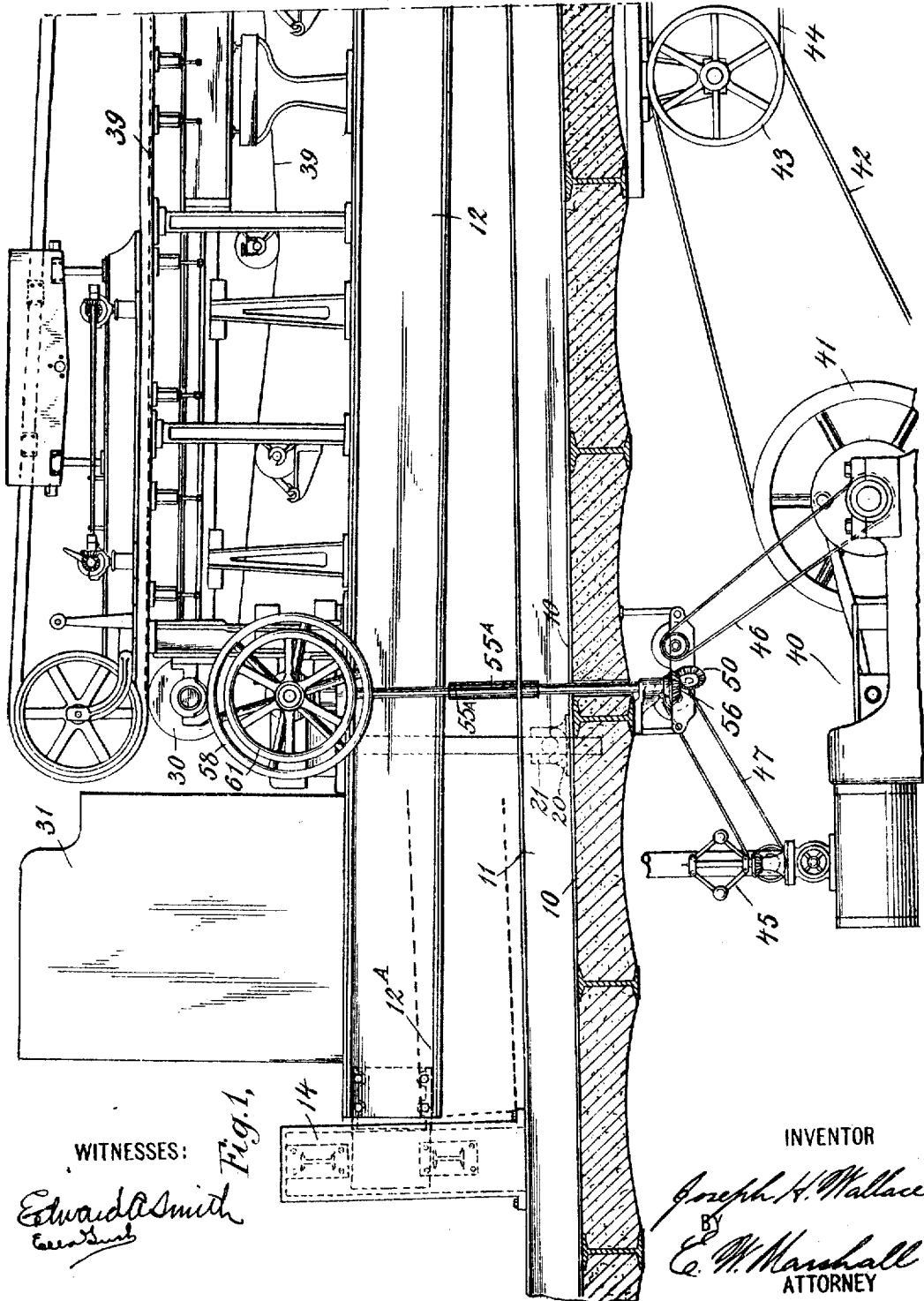


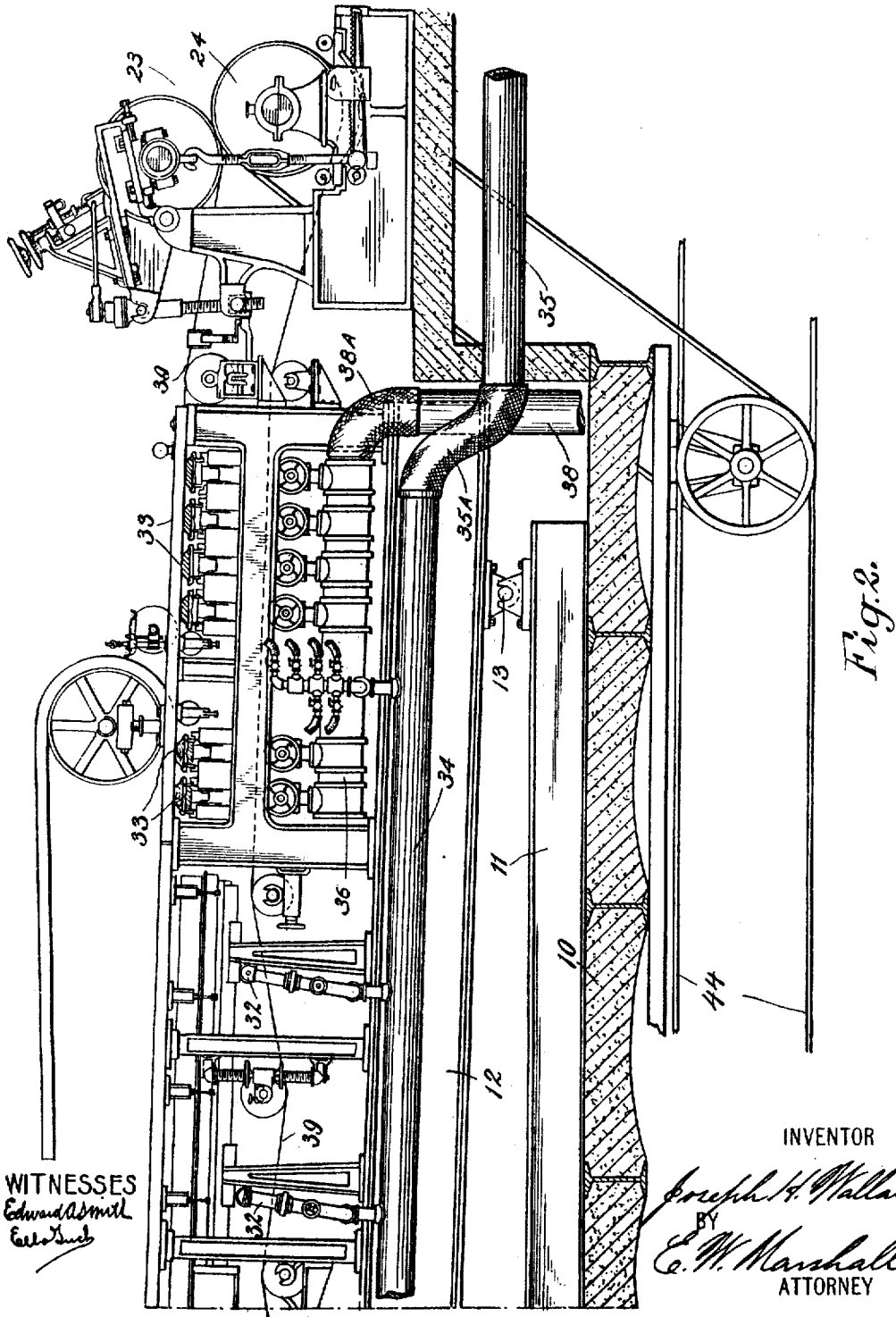
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PAPER MAKING MACHINE.
APPLICATION FILED MAR. 9, 1908.

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Patented Nov. 23, 1909.
4 SHEETS—SHEET 2.



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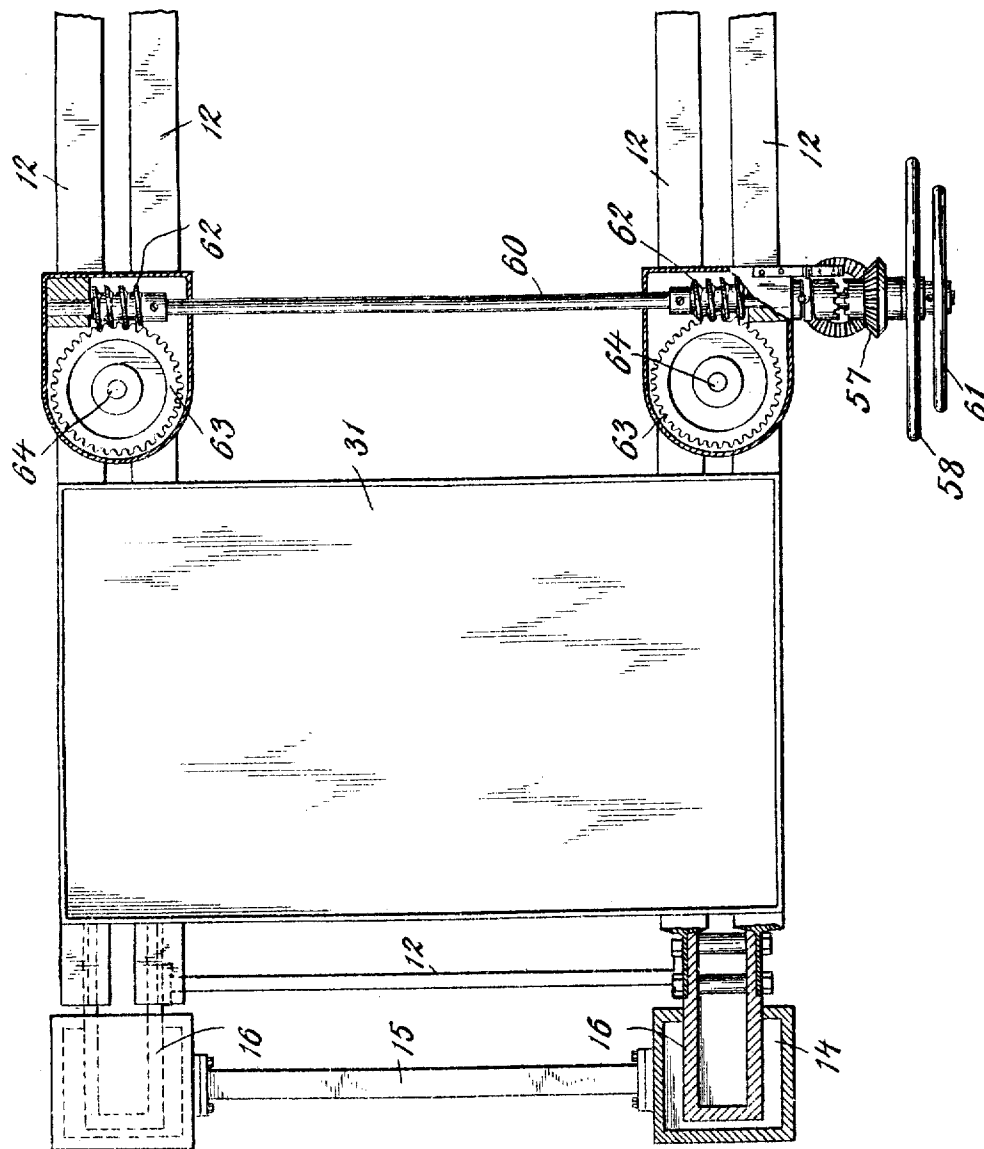


Fig. 3.

WITNESSES:

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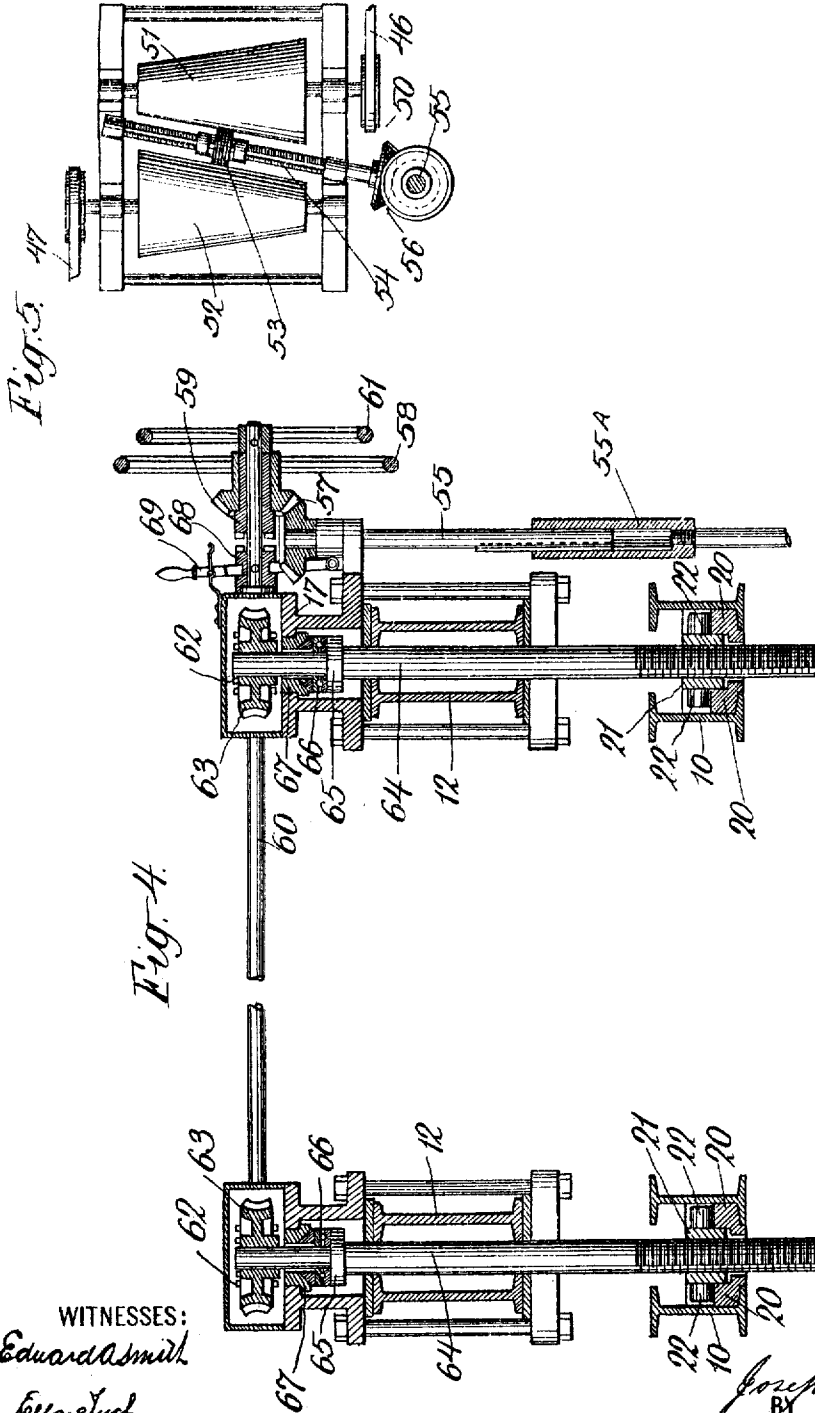
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UNITED STATES PATENT OFFICE.

JOSEPH H. WALLACE, OF NEW YORK, N. Y.

PAPER-MAKING MACHINE.

940,950.

Specification of Letters Patent.

Patented Nov. 23, 1909.

Application filed March 9, 1908. Serial No. 419,846.

To all whom it may concern:

Be it known that I, JOSEPH H. WALLACE, a citizen of the United States, and a resident of the city of New York, in the county of New York and State of New York, United States of America, have invented certain new and useful Improvements in Paper-Making Machines, of which the following is a specification.

10 My invention relates to improvements in paper making machines and its object is to improve upon apparatus of this character and to increase its efficiency, adaptability and ease of operation.

15 It relates, especially, to the Fourdrinier mechanism and its associated parts and consists in the construction and arrangement of parts which I will describe in the following specification and the novel features 20 whereof I will point out in claims.

Referring to the drawings, Figures 1 and 2 are a side elevation of certain parts of a paper making machine and associated parts showing my invention applied thereto. Fig. 3 is a plan view of one end of the apparatus shown in Fig. 1 with certain parts removed to more clearly show the construction. Fig. 4 is a sectional end elevation of an adjusting mechanism which I employ in carrying out 30 my invention. Fig. 5 is a top plan view of a detail of the apparatus, this figure showing a portion of a speed regulating mechanism.

Like characters of reference designate 35 corresponding parts in all of the figures.

10 designates the foundation upon which various parts of a paper making machine are mounted. 11 are I-beams forming a part of this foundation and supporting the 40 Fourdrinier portion of the machine.

12 designates a frame of structural steel or other suitable construction which forms the base of the Fourdrinier mechanism. 13 is a hinge-block at the rear end of this 45 frame 12 connected with the foundation 10.

14, 14 are a pair of pedestals suitably affixed to the foundation 10 and connected together by a tie-bar 15 and arranged to guide the forward end of the Fourdrinier 50 mechanism.

16, 16 are guide-blocks secured to the end of the frame 12 and projecting into the pedestals 14. These guide-blocks and pedestals are so arranged that the blocks may

move up and down within the pedestal but 55 are firmly held against lateral movement.

20 is a supporting block upon the foundation 10 which is arranged to hold the forward end of the Fourdrinier mechanism through an adjustable supporting arrange- 60 ment which I will describe fully hereinafter.

All the parts of the Fourdrinier mechanism, including the shower pipes 32, the suction boxes 33 and the flow-box 31, are mounted upon the frame 12. The showers are 65 connected with a pipe 34 which is connected with another pipe 35 from a suitable source of water supply through a flexible conductor 35^A. The suction boxes are connected with a header 36 in the usual manner and 70 with a pipe 38 from a vacuum pump through a flexible conductor 38^A.

39 designates the Fourdrinier wire which is carried in the usual manner from the breast-roll 30, the lower roll 24 of the couch 75 23 and over or under intermediate carrying rolls and guide rolls.

40 is an engine for driving a paper making machine. In the drawings I have shown a steam engine, the fly-wheel 41 of which is 80 connected by means of a belt 42 with a countershaft-pulley 43. 44 is another belt extending to one or more other countershafts and through other mechanical connections to the various driven members of the ap- 85 paratus.

45 is a centrifugal governor for controlling the speed of the engine. This governor is connected with the driven shaft of the engine by means of belts 46, 47 and intermedi- 90 ate controlling mechanism 50 which is clearly shown in Fig. 5.

The controlling mechanism 50 comprises a cone-pulley 51 driven by the belt 46 and a similar cone-pulley 52 which is connected 95 with the governor 45 by the belt 47. These two cone-pulleys are connected by a friction wheel 53 loosely mounted upon a collar on a threaded shaft 54. The position of this friction wheel upon this shaft may be adjusted 100 by rotating the shaft which may be done by rotating the vertical regulating shaft 55. A pair of bevel-gears 56 connects the vertical regulating shaft 55 and the threaded shaft 54. 57 is another pair of bevel-gears which 105 connects the vertical shaft 55 with a hand-wheel 58. One of these bevel-gears and the hand-wheel are connected together and are

mounted upon a sleeve 59 which is loosely supported upon a shaft 60. As the length of the vertical shaft 55 is variable, a splined sleeve 55^A may be interposed to provide for this change in length. 61 designates another hand-wheel and this is keyed or otherwise affixed to the shaft 60. A pair of worms 62, 62 are also attached to the shaft 60, and these are in mesh with the worm-gears 63, 63 upon vertical screw-shafts 64, 64. These screw-shafts pass through blocks 21 which are threaded to fit the thread on the shafts and are provided with gudgeons 22 which rest in the supporting blocks 20. Shoulders 65 near the upper end of each of these shafts support roller bearings 66, and swivel-blocks 67 resting upon these bearings and engaging with portions 17 of the frame 12, sustain the weight of the frame and the parts of the apparatus which are supported upon it.

68 is a clutch member splined to the shaft 50 and arranged to be moved into engagement with the sleeve 59 which is properly formed for this purpose. A hand-lever 69, connected with the clutch-member 68, is provided for this purpose.

By means of the mechanism above described, the speed of the engine 40, which is controlled by the speed governor 45, may be varied by manipulating the hand-wheel 58. The hand-wheel 61 is for the purpose of adjusting the position of the frame 12 and the entire Fourdrinier mechanism which it supports. It has already been shown that the rear end of this frame is supported by the hinge-block 13 and its forward end by the screw-shafts 64. As the latter are rotated they move up or down in the blocks 21, and with these screws the forward end of the frame 12 is elevated or depressed. By this arrangement the forward end of the entire Fourdrinier mechanism may be raised to any desired height to give a decided downward slope to the upper surface of the Fourdrinier wire, or it may be depressed until this end of the frame is lower than the rear end as is indicated by the dotted lines at 12^A in Fig. 1.

The two adjustments of speed and slope above described may be made independently of each other. By throwing in the clutch-member 68 both of these adjustments may be made simultaneously, and the mechanism is so arranged that the speed of the engine, and consequently of the entire machine which it drives, will be increased when the forward end of the frame 12 is raised.

Slight adjustments of the slope of the Fourdrinier wire have been made for the purpose of varying the quality of the manufactured paper. It has also been found advantageous to so construct the wet end of a paper making machine to give the Fourdrinier wire a substantial downward decli-

nation in order to allow the gravity flow of the stock upon the Fourdrinier wire to increase the output of the machine by increasing the speed at which the stock is fed to the various presses and other parts of the apparatus. In carrying out the latter idea machines have been installed with the forward end of the Fourdrinier wire blocked up, which arrangement has necessitated the readjustment of the various parts of the mechanism which are associated with the Fourdrinier wire. A paper making machine thus set up and adjusted has great efficiency for manufacturing a given kind and quality of paper.

One of the objects of my invention is to provide a machine which is capable of using different varieties of stock and which may be used for making papers of different classes and qualities. The apparatus which I have shown and described may be readily and almost immediately changed to suit varying conditions. To accomplish this result I have mounted the entire Fourdrinier mechanism, including the flow-box, upon an adjustable base and have associated with it an arrangement for controlling the speed of the driving engine. It is a point of importance that the flow-box should be mounted upon this movable frame as thereby the head which causes the flow of stock onto the Fourdrinier wire is maintained constant regardless of the vertical position of the forward end of the frame. It is also important that all of the parts associated with the Fourdrinier wire be mounted together on the same frame as by this arrangement the various parts remain in the same relative positions regardless of the amount of slope which is given to the Fourdrinier wire.

In making some classes of paper it is desirable to have the stock carried up-grade by the Fourdrinier wire in order to gain the desired results, and in some cases a considerable down-grade in the Fourdrinier wire may be used advantageously. My improved apparatus may be used for a large variety of work, and by the arrangements which I have described, the machine may be quickly changed from one class of paper to another. It is also possible to give the slight variations of slope in the Fourdrinier wire which are necessary for obtaining the proper results in the quality of the kind of paper which is being made at a given time.

An important feature of this invention is that the desired adjustments of slope and speed may be used while the machine is running and therefore without interrupting its production. As a result it is possible to change a machine from conditions for making one class of paper to those required for another class of paper without the necessity of shutting down the machine. It is well known that such a change has heretofore re-

quired a shut down of the machine and entailed a considerable loss of time and a large proportion of a day's product of the machine.

The particular mechanism for regulating the speed of the engine and for adjusting the slope of the apparatus are arbitrarily selected and of course various other mechanisms may be used if desired to accomplish these results. It is well-known that the engine is connected through suitable arrangements with the various units of the paper making machine so that when its speed is changed, the speed of the various units is also changed. It is also well-known that between the driving engine and each separate unit, independent speed varying mechanisms are employed, but as these form no part of the present invention, I have not thought it necessary to illustrate them in the drawings.

What I claim is:—

1. In a paper making machine, a complete Fourdrinier wire and its supports, a flow-box; a frame upon which said supports and flow-box are mounted, means for maintaining one end of the frame at an approximately fixed level, and means for raising and lowering the other end of said frame.

2. In a paper making machine, a complete Fourdrinier wire, supporting mechanism therefor, a frame upon which said supporting mechanism is mounted, a flow-box also mounted upon said frame; a pivotal support for the rear end of the frame, and an adjusting mechanism supporting the forward end of the frame and arranged to vary the height thereof.

3. In a paper making machine, a Fourdrinier mechanism comprising a Fourdrinier wire and its supports, a suction device and showers; a frame upon which said Fourdrinier mechanism and its associated parts are mounted, a flow-box also mounted upon said frame; a hinge device supporting the rear end of the frame, a screw mechanism supporting the forward end of the frame and arranged to vary the height of the forward end of the frame, and flexible conductors connected with the suction device and showers.

4. In a paper making machine, a Fourdrinier mechanism, a frame supporting said mechanism, means for driving the machine, and mechanism for raising or lowering one end of the frame and at the same time increasing or decreasing the speed at which the machine is driven.

5. In a paper making machine, a Fourdrinier mechanism, a frame supporting said mechanism, means for driving the machine, associated mechanism for raising or lowering one end of the frame and for together or separately increasing or decreasing the speed at which the machine is driven.

6. In a paper making machine, a Four-

drinier mechanism, a frame supporting said mechanism, means for driving the machine, a movable member for raising or lowering one end of the machine, a separate movable member for increasing or decreasing the speed at which the machine is driven, and means for connecting said movable members together.

7. In a paper making machine, a Fourdrinier mechanism, a frame supporting said mechanism, a hinge device supporting one end of the frame, an adjusting mechanism supporting the other end of the frame at variable heights, means for driving the machine, a speed regulating mechanism for said driving means, a hand-wheel for actuating the adjusting mechanism, another hand-wheel for actuating the speed regulating mechanism, and means for connecting said hand-wheels together.

8. In a paper making machine, a Fourdrinier wire, supporting mechanism therefor, a flow-box, a frame upon which said supporting mechanism and flow-box are mounted, a hinge device supporting the rear end of the frame, a screw mechanism supporting the forward end of the frame and arranged to vary the height of the forward end of the frame, means for driving the machine, a speed regulating mechanism for said driving means, a hand-wheel for actuating the screw mechanism, another hand-wheel for actuating the speed regulating mechanism, and a clutch for connecting said hand-wheels together.

9. In a paper making machine, a Fourdrinier mechanism comprising a Fourdrinier wire, supporting mechanism therefor including a breast-roll, suction boxes and showers; a frame upon which all of said Fourdrinier mechanism is mounted, a hinge device supporting the rear end of the frame, an adjusting mechanism supporting the forward end of the frame at variable heights, flexible conductors to the suction boxes and showers, a variable speed motor for driving the paper making machine including said Fourdrinier wire, a speed regulating mechanism for said motor, a hand-wheel for actuating the adjusting mechanism to vary the height of the forward end of the frame, another hand-wheel for actuating the speed regulating mechanism to vary the speed at which the Fourdrinier wire and the machine are driven, and a clutch for connecting said hand-wheels together.

10. In a paper making machine, a Fourdrinier mechanism comprising a Fourdrinier wire, supporting mechanism therefor including a breast-roll, suction boxes and showers; a flow-box, a frame upon which all of said Fourdrinier mechanism and flow-box are mounted, a hinge-block supporting the rear end of the frame, a screw mechanism supporting the forward end of the frame at

variable heights, flexible conductors to the
suction boxes and showers, a variable speed
motor for driving the paper making ma-
chine including said Fourdrinier wire, a
5 speed regulating mechanism, a hand-wheel
for actuating the screw mechanism to vary
the height of the forward end of the frame,
a worm and gear mechanism connecting said
hand-wheel with the screw mechanism, an-
10 other hand-wheel for actuating the speed
regulating mechanism to vary the speed at

which the Fourdrinier wire and the machine
are driven, and a clutch for connecting said
hand-wheels together.

In testimony whereof I have signed my 15
name to this specification in the presence of
two subscribing witnesses.

JOSEPH H. WALLACE.

Witnesses:

L. E. GUNDERSON,
D. REDMAYRE.