July 5, 1927.

1,634,885

F. A. PESCHL

PAPER MAKING MACHINE

Filed March 22, 1926

3 Sheets-Sheet 1

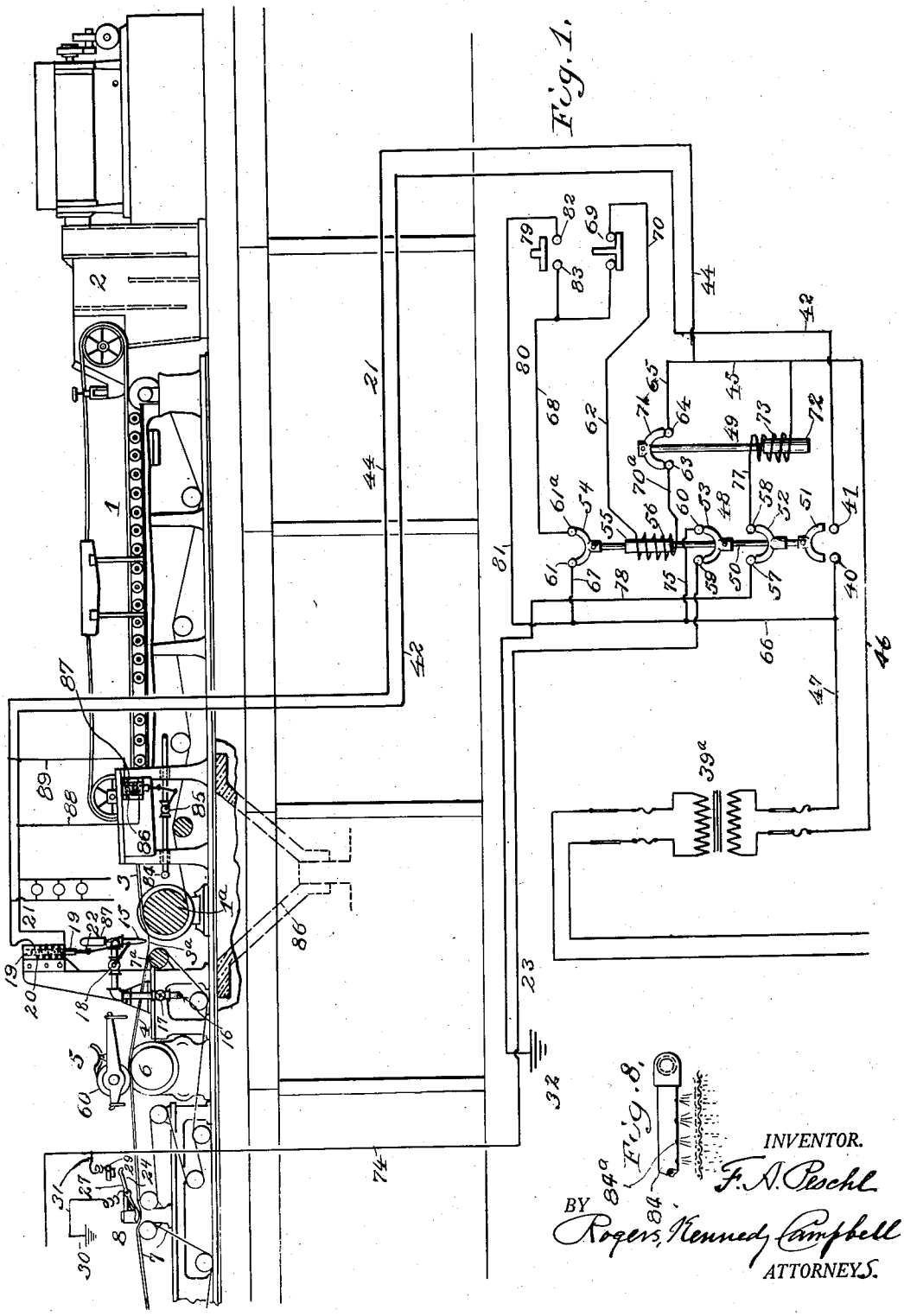


Fig. 1.



Fig. 8.

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3 Sheets-Sheet 2

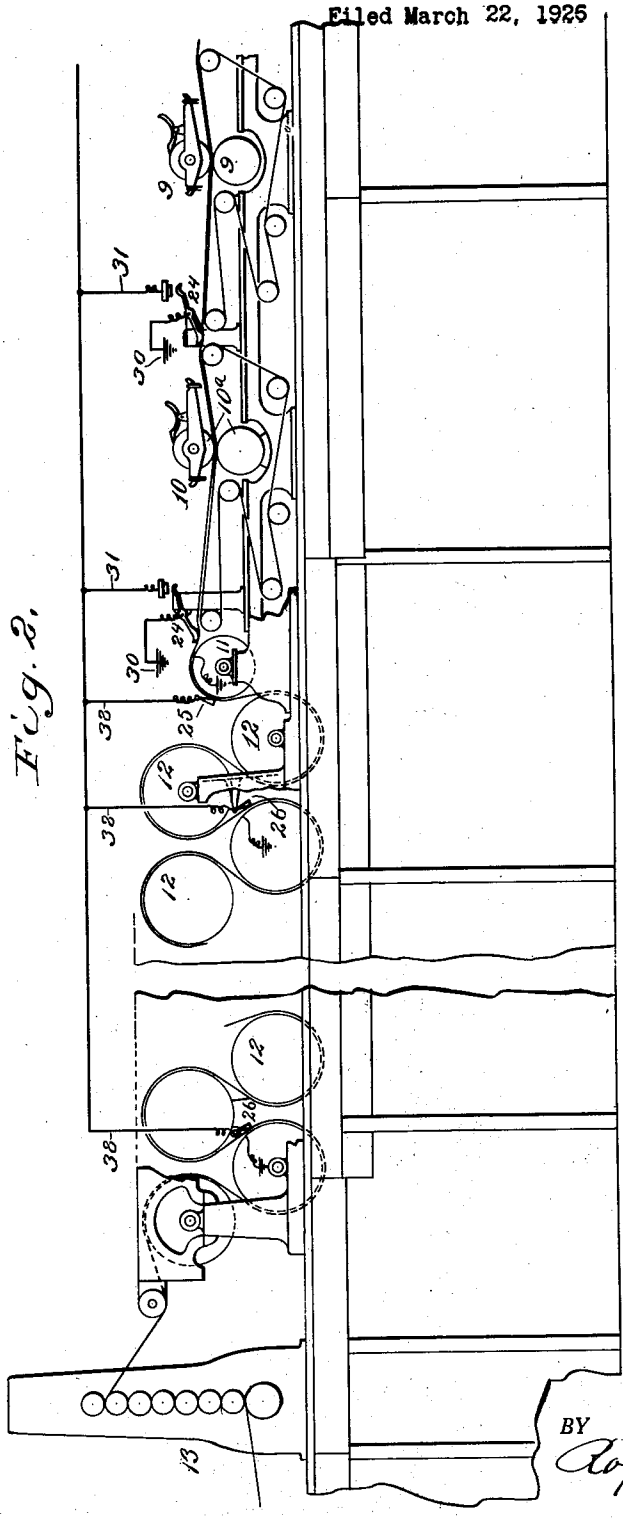



Fig. 2.

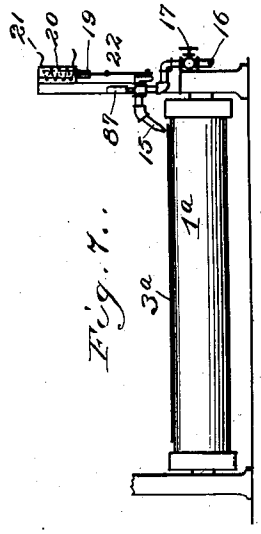



Fig. 4.

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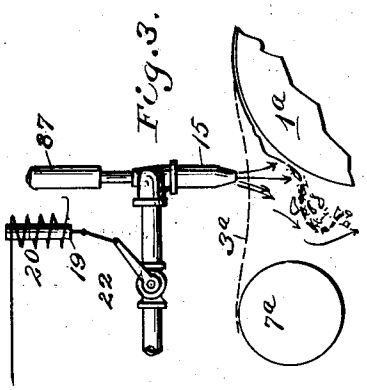
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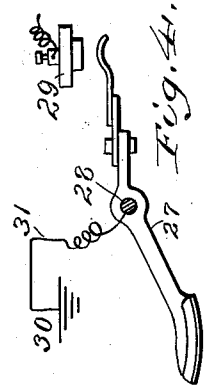
July 5, 1927. 1,634,885

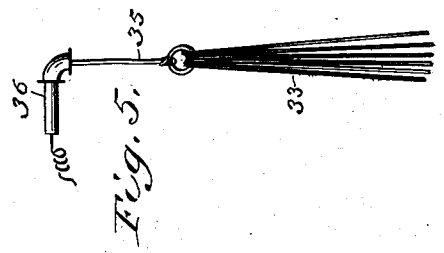
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PAPER MAKING MACHINE

Filed March 22, 1926 3 Sheets-Sheet 3







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# UNITED STATES PATENT OFFICE.

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## PAPER-MAKING MACHINE.

Application filed March 22, 1926. Serial No. 96,405.

This invention relates to paper making machines, and has for its object to prevent the accumulation in the machine, preferably without stopping the operation of the same, of the "broke" or waste paper, and the serious objections and delay incident thereto, in the event of the accidental parting of the paper web in its normal travel through the machine.

Under the present practice, in the event of the accidental parting of the web, it is necessary to stop the operation of the machine in order to prevent the continued feed of the web in rear of the break, from accumulating the waste paper, and in order to give the workman opportunity to reestablish the proper feed. Such cessation of operation of the machine is of course objectionable in that it causes delay in operation, reduced output, and other objections. On the other hand if the machine is not shut down, the continued feed of the web will cause the paper to accumulate and pile up in the presses or dryers or other parts of the machine, according to the point at which the parting of the web occurs, and this results in serious objections and injury to the parts, and danger and discomfort to the workman. For instance, the undue accumulation of "broke" or waste paper onto the broke troughs of the presses, will cause the material to fall down on the felts and break or strain them when the broke is passed by the felt to the next press. And the accumulation of the broke in the dryers necessitates much time in the removal of the waste material, usually accomplished by long spears manipulated by the workmen, frequent injury to the workman standing by, or injury to the dryer canvas or other parts.

In accordance with the present invention these objections and others incidental to the accidental parting of the web, are avoided by the provision of controllable means for causing the break of the web automatically by the accidental parting of the web, at a point in rear of that where the parting takes place, so although the machine will continue in motion, it will cease to feed the web in a way which will cause the accumulation of the broke in the machine and the objections incident to such accumulation.

The invention also contemplates signaling means brought automatically into operation by the accidental parting of the web, whereby an indication will be given the workman at once of such parting.

Means and mechanism of different forms and construction may be employed in accordance with my invention in effecting these objects, and in the accompanying drawings I have illustrated one exemplification of such means and mechanism, in which a fluid blast or jet is employed, adapted to impinge against the traveling paper web at the point in the machine where the web passes from the couch roll to the first press felt, and operative to start a break in the web, which break, due to the tension under which the web is being fed and the condition of the web at this point, will quickly continue laterally entirely across the web and cause the same to break clear through, suitable means being provided cooperative with the traveling web at one or more points in advance of the blast means, and operating in the event of the accidental parting of the web, to automatically bring the blast means into action. It will be understood however that the invention in its broader aspects is not limited to this particular embodiment, but includes as well, other forms and embodiments which will operate to bring about the desired results.

The detailed form and construction of the mechanism and the cooperation of the parts thereof will be fully set forth in the specification to follow, and the novel features thereof set out in the appended claims.

In the accompanying drawings:

Fig. 1 is a view mainly diagrammatic in character, of the "wet" end of a Fourdrinier paper making machine, having my invention embodied therein, the same illustrating a diagram of the electric circuits controlling the operation of the web breaking means.

Fig. 2 is a similar view of the dry end of the machine.

Fig. 3 is a side elevation on an enlarged scale of the electrically operated fluid blast nozzle for applying the blast to cause the break of the web, the same being shown in cooperative relation to the couch roll and head roll of the first press felt, to deliver the blast against the web bridging these parts.

Fig. 4 is a side elevation on an enlarged scale of a form of contactor employed in co-operation with the paper web in the press

to close the contactor circuit controlling the blast means.

Fig. 5 is a side elevation on an enlarged scale of a form of contactor employed in cooperation with the web on a drying cylinder to control the contactor circuit.

Fig. 6 is a perspective view on an enlarged scale of a number of drying cylinders, showing the contactor of Fig. 5 supported in operative relation to the web to control the contactor circuit.

Fig. 7 is a view in the nature of an elevation showing the relation of the web breaking blast nozzle to the web where it passes from the couch roll to the first press felt.

Fig. 8 is a fragmentary view in elevation showing the relation of the shower pipe to the forming wire to enable the latter to be freed of adhering pulp.

Referring to the drawings:

Referring to Figs. 1 and 2 which show conjointly a Fourdrinier paper making machine, 1 indicates the usual endless forming wire onto the receiving end of which the pulp, from a supply tank or chest 2, is delivered, the said wire in its travel, supplemented by the usual suction boxes (not shown), forming the pulp into a moist self-holding web 3 which passes from the delivery end of the wire supported by the couch roll $1^a$, to the conveying felt 4 of the first press 5. The felt 4 carries the web between the first press rolls 6, and the web issuing therefrom is carried by the felt to the press felt 7 of the second press 8, and after passing between the rolls 9 of the second press, it passes to the third press 10, and after issuing from between the rolls $10^a$ of this press it passes onto the baby dryer cylinder 11, whence the web passes back and forth around the main drying cylinders 12 and finally leaves the last drying cylinder of the series and passes into the calender stack 13.

In accordance with my invention, means, in the present instance in the form of a fluid blast delivery nozzle 15, is employed to cause the break of the traveling paper web when the web parts accidentally in its travel through the machine, which nozzle is arranged to direct the blast against the web at the point where the web is in a moist condition and can be readily disintegrated by the action of the blast. The web is in this condition at the point where it passes from the couch roll $1^a$ to the first press felt, the blast nozzle being arranged to point downwardly so as to direct the blast, preferably air, against the portion of the web $3^a$ bridging the space between the couch roll and the guide roll $7^a$ of the first press felt.

The nozzle is supplied with air under pressure from a suitable source of supply by a pipe 16 which is furnished with a manually operated cut-off valve 17, whereby the air blast may be shut off at will as will be presently explained more in detail. Between the valve 17 and blast nozzle, the supply pipe is furnished with a valve 18 for the automatic control of the blast in accordance with my invention, which valve is normally closed so as to shut off the blast in the normal travel of the paper web through the machine, but which is adapted to be opened automatically in the event of the accidental parting of the web, so as to permit the blast to then act on and cause the web to break and thereby prevent the further feed of the web through the machine at this point.

To effect this object, valve 18 is operated by electrical means in the form of a solenoid core 19 surrounded by a solenoid coil 20 included in a normally open power circuit 21 more fully described hereinafter, which when closed will cause the coil to move the solenoid core endwise, and, through the medium of links 22 connected respectively with the core and valve, turn the latter to open position and release the blast.

The closure of the power circuit is effected automatically when the paper web parts accidentally, by means of contactors in a normally open contactor circuit 23, which contactors are arranged at a number of points in the machine, contactors 24—24 at different points in the three presses, a contactor 25 at the baby dryer, and contactors 26—26, etc., in the main dryer section. The contactor circuit when closed, will through the medium of electrically operated means more fully described later on, close the power circuit 21 and will thereby turn on the air blast, and such closure of the contactor circuit will take place in the event of the accidental parting of the paper web. To effect this closure of the contactor circuit, the contactors 24 in the presses are of a form which will be held in open position by the tension of the web when the latter is traveling normally through the machine, but which, when the tension of the web is relieved, as when the web parts, will automatically close and will thereby close the contactor circuit. And the contactors 25 and 26 cooperative with the drying cylinders, are of a form which will be held open by the presence of the web on the cylinders in the normal travel of the web, but which when the web parts and the leading end of the broken web passes from between the contactors and cylinders, will contact with the cylinder and thereby "ground" through the machine and close the contactor circuit.

The contactors 24 are each in the form of a lever 27 as best shown in Fig. 4 pivoted between its ends as at 28 to a fixed part of the machine frame in such position that one end of the lever will rest upon and be supported by the paper web where it passes from the delivery end of the felt of one

press to the receiving end of the felt of the next press, the tension of the web in its normal travel through the machine thus holding the lever in a position which will hold its opposite end out of contact with a contact plate 29. The lever is grounded through the machine frame as at 30 by a conductor 31 and the contact plate 29 is connected in the contactor circuit 23, which latter is grounded through the machine as at 32 as will be presently described more in detail. As a result of this form and arrangement of the contactors 24, when the paper web accidentally parts at a point in rear of any of the three contactors, the tension of the web being relieved, will allow that end of the lever bearing on the paper, to descend and the opposite end will rise in contact with the contact plate 29, thus closing the contactor circuit and turning on the blast, which impinging upon the paper web at the point between the couch roll and first press felt will cause the web to break at this point. The contactors 24 will thus act to turn on the blast whenever the accidental parting of the web occurs between the first and second press or between the second and third press, or between the third press and the baby dryer, the parting of the web at any of these points thus acting to instantly operate the blast means and break the web in rear of the parting point of the latter, so that the further feed of the paper in rear of the parting point will be arrested.

The contactors 25 and 26 cooperating with the dryer cylinders are best shown in Fig. 5 and consist each of a number of metal contactor rods 33 suspended loosely from a ring on the lower end of a stem 35 carried by a supporting arm 36 fixed to a fixed part 37 of the machine frame as shown in Fig. 6. The stems 35 of the several contactors are connected respectively by branch electric conductors 38 in the contactor circuit 23, which, it will be remembered is grounded through the machine as at 32, and the contactor rods 33 supported as above described rest loosely on and ride upon the paper web supported by the dryer cylinders in the normal travel of the web through the machine, the web thus preventing contact of the rods 33 with the dryer cylinders and maintaining the contactor circuit open at these points.

As a result of the form and arrangement of the contactors 25 and 26 as above described, when the paper web accidentally parts at any point beyond the third press, the leading broken end of the web in passing from between the contactor rods 33 of the next contactor in advance of the point where the parting occurs, will permit said rods to contact with their associated dry cylinder, by which contact the contactor circuit will be closed at this point, which will act to turn on the blast and cause the web to break between the couch roll and first press. These contactors 25 and 26 will therefore operate to turn on the blast whenever the accidental parting of the web occurs at any point in the machine beyond the presses, with the result that the web will be automatically broken at a point in rear of that at which the accidental parting occurs, so that further feed of the paper web in rear of the parting point will be arrested.

The power circuit 21 before alluded to as operating the solenoid core 19, may be supplied by a direct or by an alternating electric current. In the present instance I employ an alternating current from a power supply line furnished with a transformer 39ª. The said power circuit normally is open at the spaced contact points 40 and 41, and starting at point 41, a conductor 42 leads to the solenoid coil 20 operating the valve controlling the blast, and a return conductor 44 connects with a conductor 45 which in turn connects with a conductor 46 leading to the transformer 39ª, and a conductor 47 connected with the transformer leads to the contact point 40. This power circuit, as before explained, is normally open when the machine is operating under normal conditions with the paper web passing through the machine intact, but it is adapted to be closed when the paper web accidentally parts, as previously described, by an electrically operated switch mechanism 48 controlled in its operation by a relay 49, which in turn is operated by the contactor circuit 23.

The switch mechanism 48 comprises in the present instance an endwise movable rod 50 carrying four switch arms 51, 52, 53 and 54 insulated from said rod. The rod carries a solenoid core 55 surrounded by a solenoid coil 56, which coil when energized will hold the rod in the position shown, with the contact switch arm 51 free of the contact points 40 and 41, with which said arm is adapted to contact to close the power circuit when the coil is deenergized.

The switch arms 52 and 53 are adapted to contact respectively with spaced contact points 57 and 58, and with spaced contact points 59 and 60, at different points in the contactor circuit; and the switch arm 54 is adapted to contact with contact points 61 and 61ª included in a switch operating circuit 62 including the solenoid coil 56, these arms 52, 53 and 54 being held in contact with their associated contact points and maintaining the contactor circuit and switch circuit closed at these points, when the core is energized and is holding the power circuit open, but moving to disengage the contact points and opening the circuits at these points, when the coil is deenergized to close the power circuit.

In the switch circuit 62 at another point, these are two spaced contact points 63 and

64, at which point the circuit is controlled by the relay 49, and starting at the point 64 a conductor 65 leads to the conductor 45 which joins conductor 46 connecting with the transformer and returning from the transformer the current passes by conductor 47 to conductor 66, thence to conductor 67 connecting with contact point 61, whence the current passes by switch arm 54 to contact point 61ª, thence by conductor 68 to a normally closed hand-operated switch 69, and leaving the switch the current passes by conductor 70 to the solenoid coil 56, which coil is connected with the contact point 63 by conductor 70ª.

The relay 49 normally maintains this switch circuit thus traced, closed at the spaced points 63 and 64, and it opens the circuit whenever the relay is operated by the closing of the contactor circuit. To effect this object, the relay carries a switch arm 71 normally contacting with the contactor points 63 and 64 in the switch circuit, and the relay is operated by a solenoid core 72 surrounded by a solenoid coil 73 included in the contactor circuit, the said coil when deenergized, as in its normal condition, holding the switch arm in contact with the contactor points 63 and 64 and maintaining the switch circuit closed, but when deenergized, causing the switch arm to disengage the contact points and thereby open the switch circuit.

This contactor circuit receives its current from the transformer, and the current flows through the following conductors constituting the circuit. Contactor bus conductor 74 has connected with it the branch conductors 31 and 38 leading from the several contactors associated with the presses and the dryer cylinders, and said conductor 74 leads to the contact point 59, from which the current passes through switch plate 53 to contact point 60, thence by a conductor 75 to conductor 66, thence through conductor 47 to the transformer, and returning from the transformer by conductor 46, the current passes through conductor 76 connecting with the relay coil 73, and traversing the relay coil the current passes by conductor 77 connected with contact point 58. The current then passes through switch arm 52 to contact point 57 connected to conductor 78 of the contactor circuit which is grounded through the machine frame at 32, as before explained.

In the operation of the parts above described, when the contactor circuit is closed by the closing action of any of the contactors, the relay switch arm 71 will open the switch circuit at the spaced contact points 63 and 64 by disengaging said contact points, and the solenoid coil 56 which had been holding the core 55 up with the switch arms 57 out of contact with the contact points 40 and 41 in the power circuit, being deenergized, will permit the switch rod 50, and consequently the switch arm 51, to move into contact with said contact points 40 and 41 and thereby close the power circuit. The closing of the power circuit will open the blast controlling valve 18 and permit the blast to act in effecting the brake of the web. This same movement of the switch rod 50 in closing the power circuit, will, through the medium of the switch arms 52 and 53, open the contactor circuit at the points therein where the spaced contact points 57 and 58 and the spaced contact points 59 and 60 are located, and the switch arm 54 will open the switch circuit at the point therein where the spaced contact points 61 and 61ª are located. By the opening of the contactor circuit in this manner, the relay coil 73 being deenergized, the relay switch arm 71 will move back to contact with contact points 63 and 64 of the switch circuit and this circuit will be again instantly closed at this point. But it will remain open at the point therein where the contact points 61 and 61ª are located, and in order to complete the closure of the switch circuit so as to again open the power circuit and shut off the blast, whose momentary action only will be necessary to start the break in the web, a normally open resetting switch 79 adapted to be manually operated, is employed. This switch is located in a branch circuit 80 of the switch circuit, which circuit 80 branches around the gap in the switch circuit opened by the switch arm 54 as described, and comprises a conductor 81 connected with conductor 67 and connected also with one of the switch points 82 of the resetting switch, the other switch point 83 of the switch being connected with the conductor 68 of the switch circuit. When this resetting switch is closed, the current will flow from the transformer by conductors 47, 66, 81, switch 79, normally closed manually operated switch 69, conductor 70, coil 56, switch plate 71, conductor 65, conductor 45, and conductor 46 back to the transformer. This will energize the switch coil 56, and the switch rod 50 will be shifted endwise and the switch arms 51, 52, 53 and 54 operated to open the power circuit, and close the contactor circuit, and the switch circuit at the contact points 61 and 61ª.

It will be understood that before restoring the parts to their former normal condition by the operation of the resetting switch as just described, the paper web broken by the blast must be again started through the machine so as to hold the contactors 24, 25 and 26 in a position which will open the contactor circuit, otherwise and if the resetting switch were operated before the travel of the web was reestablished, the contactor circuit being closed, due to the absence of the web with which the contactors cooperate, the relay would be operated to again open the switch circuit.

In the action of the blast in causing the break of the web between the couch roll and first press felt, the blast blows the ruptured web downwardly, and because the web at this point is weak and unpressed, it can be returned without trouble to the supply tank of the machine, thereby avoiding any re-preparation of the wet "broke" to enable it to be again supplied to the machine.

When after the cessation of the feed the machine has been cleared out and is ready for the feed of the paper to be reestablished, the web is again tendered through the machine, and as soon as it arrives at the calender stack, the resetting switch 79 is operated to restore the mechanism to its former normal condition in readiness for the next operation.

The purpose in providing for the breaking of the contactor circuit at the two points therein when the switch mechanism is operated to turn on the blast, is to prevent sparking of the contactors, and avoid danger to workmen coming in contact with the contactors in working around the machine in removing the "broke" or in reestablishing the feed of the paper web.

The only function of the relay 49 is to give a momentary impulse sufficient only to break the switch circuit. Therefore the accumulation of dirt or other foreign substances on the surface of the dryer cylinders, or on the associated contactors, will not interfere with the momentary actuation of the relay; and a contact of the contactor rods for a single instant with the cylinder, followed by interruption due to dirt, will be sufficient to bring the switch mechanism 48 into action, which latter will operate with definite power and reliably, to close the power circuit. It is seen therefore that it would not be desirable to operate the blast means directly from the contactor circuit, since, due to the liability of interruption of the circuit from the clogging of the surfaces by dirt, the blast would operate intermittently and ineffiectively with a rapid puffing action.

The relay coil 73 has a high resistance relatively to the switch coil 56 and therefore takes a relatively small amount of current. Under these circumstances there will be but little, if any, sparking between the contactors and parts of the machine with which they engage, so that there will be little or no liability of pitting the cylinders or other parts of the machine with which the contactors cooperate.

It will be understood that but a momentary operation of the blast will be necessary to start the break of the web at the point where it passes from the couch roll to the first press felt. It is the practice therefore of the attendant, to turn off the blast by the cut-off valve 17, just as soon as the break is started, and then when the power circuit has been opened again by the resetting switch and the valve 18 thus closed by the deenergizing of the coil 20, the attendant again opens valve 17 so that the blast will be ready to flow on the next automatic operation of the parts.

Or the cut-off valve 17 may be set to nearly closed position so as to allow the air to "bleed" through, and accumulate pressure in the pipe between the valve 17 and the electrically operated valve 18. As thus set, when the valve 18 is turned on, the accumulated pressure in the pipe back of it will cause the air to issue from the nozzle in a sudden puff or blast which will be sufficient to start the break in the web. Under these conditions the valve 18 can be left open without material waste of air and until the attendant, after the new web has been started through the machine, opens the power circuit by the resetting switch 79 and thereby causes the closure of the valve 18, it being understood that while this latter valve remains open, the air bleeding by the nearly closed valve 17 will escape in but very small quantity. On the closure of the valve 18, the air bleeding past valve 17 will again build up pressure in the pipe back of the valve 18 ready for another blast or puff through the nozzle when the valve 18 is again opened.

In order to prevent the accumulation of pulp on the forming wire in the continued travel of the wire and the continued feed of the pulp thereto after the web is broken by the blast, which accumulation would result in the fall of the pulp from the felt in the lower stretch of the wire at different points and the littering up of the floor, and loss of material, I provide means, brought into action automatically on the parting of the web, or when the breaking blast is brought into action, which means will act to shower the lower stretch of the wire and free it of the adhering pulp. This means is shown in Fig. 1, and in the present instance consists of a fixed shower pipe 84 extended horizontally transversely above the lower stretch of the wire just behind the couch roll, and suitably supported from the frame of the machine, the said pipe being formed in its underside with perforations 84ª through which jets of a suitable cleansing fluid, such for instance as white water, will issue and fall on the traveling wire. The pipe is connected with a suitable source of liquid supply, and is provided with a normally closed controlling valve 85 whose stem is operatively connected with a solenoid core 86 surrounded by a coil 87 connected by electric conductors 88 and 89 to the conductors 42 and 44 of the power circuit 21. The form and arrangement of the parts are such that when the power circuit is open and the coil 87 deen-

ergized, the valve will be in closed position shutting off the shower, but when the circuit is closed as by the accidental parting of the web or when the switches 69 are operated to turn on the web-breaking blast independently, the coil 87 will be energized and will open the valve and thereby turn on the shower. The shower will act to flow through the wire and clear the same of adhering pulp, and the latter will fall down and be collected in a suitable saveall tank 90 arranged beneath the wire at the point where the shower acts, and from the tank the collected material may, by suitable means, be conducted away for use again in the machine

In order that the workmen may be instantly notified of the occurrence of the accidental parting of the web, I propose to provide signaling means which will be brought into action automatically when the web parts. In the present instance these signaling means are in the form of electric lights 84 placed in the power circuit as shown in Fig. 1; or electric bells or other forms of signaling means may be employed adapted to be brought into action automatically when the power circuit is closed by the accidental parting of the web. Or a whistle or siren 91 may be applied to the air blast pipe beyond the valve 18 in order to give audible signal when the blast issues on the opening of the valve.

The normally closed hand-operated switch 69 in the switch circuit 62 is for the purpose of opening said circuit and thereby operating the web breaking blast independently of the automatic operation of the same by the parting of the web. Such hand-operated switches may be located at different points in the machine so as to be within convenient reach of the workmen at different points of the machine, who by the operation of the switches, may, when occasion arises, stop the further feed of the web by operating the blast means to break the web.

Among the many advantages flowing from the invention as above described may be mentioned the following:

By the immediate detection of the parting of the web and the instant cutting off of the feed into the presses, the period of suspended production is greatly shortened. In the event of the parting of the web in the presses, the "broke" which is discharged onto the broke troughs of the presses, is small and there is no danger of the accumulated "broke" breaking the felts when it is passed from one press felt to the next press. Also the press felts are saved from sudden strain.

In case of the parting of the web in the dryers the fed sheet cannot build up a large accumulation of "broke" which would require much time in the removal by the workmen who in effecting such removal employ long spears. Under ordinary conditions the removal of the broke by spears causes accidents to workmen standing by and may injure the dryer canvas or other dryer parts. The removal of the "broke" in this manner necessitates in most cases the stoppage of operation of the whole dryer section, and the starting up of the section causes always severe strain on the gears and bearings. Therefore it is most desirable to keep this section in motion.

Due to the immediate cessation of the feeding of the material when the web accidentally parts, there is economy in the consumption of the steam, since the dryers do not have to supply heat energy to unproductive paper. It also saves energy, in curtailing the power which would otherwise have to be employed in beating and pumping the so-called "broke", and saves power also on the idle running machine. There is a saving of labor throughout the machine and at the beaters, and obstructions on the machine floor and around the broke beaters is avoided. The dryer canvas is saved from strain by avoiding the wrapping of the sheet around the cylinders by large lumps of "broke" passing between the cylinders, rolls and canvas. The workmen are relieved from strenuous watch and they are given more liberty for their other duties, and gear troubles are minimized by preventing the clogging of the same or contact therewith of the paper.

In the foregoing description and accompanying drawings I have set forth my invention in the particular detailed form and construction of the parts which I prefer to adopt, and which in practice have been found to answer to a satisfactory degree the objects to be attained. It will be manifest however that these objects may be variously changed and modified without departing from the limits of the invention; and further it will be understood that the invention is not limited to any particular form or construction of the parts except in so far as such limitations are specified in the claims.

Having thus described my invention, what I claim is:

1. In a paper making machine, the combination of means for feeding the paper web, means for causing the break of said web, and means controlled by an abnormal condition of the paper web, for actuating said breaking means.

2. In a paper making machine, the combination of means for feeding the paper web, controllable means for causing the break of said web, and means controlled by the accidental parting of the web to actuate said breaking means.

3. In a paper making machine, the combination of means for feeding the paper web, and means controlled by the accidental

parting of the web at one point in the machine and operable to automatically cause the break of the web at a point in rear of said parting.

4. In a paper making machine, the combination of means for feeding the paper web, and means operative automatically in the event of the accidental parting of the web at one point, to cause the break of the web at another point.

5. In a paper making machine, the combination of means for feeding the paper web, and means operative automatically in the event of the accidental parting of the web, to interrupt the feed of the web to the presses.

6. In a paper making machine, the combination of means for feeding the paper web, and means operative automatically in the event of the accidental parting of the web, to interrupt the delivery of the web from the couch roll to the first press.

7. In a paper making machine, the combination of means for feeding the paper web, controllable means operable to cause the web to break at the point in the machine between the couch roll and first press, and means for controlling the operation of said breaking means.

8. In a paper making machine, the combination of means for feeding the paper web, controllable means operable to cause the break of the paper web at a point in the machine between the couch roll and first press, and means operable automatically in the event of the accidental parting of the web, to control the actuation of said breaking means.

9. In a paper making machine, the combination of means for feeding the paper web, controllable means for causing the break of said web, and a plurality of controlling means for the breaking means situated respectively at different points in the machine and operable independently of each other by the accidental parting of the web, to control the action of the breaking means.

10. In a paper making machine, the combination of means for feeding the paper web, controllable means for causing the break of said web at a given point in the machine, and a plurality of controlling means for said breaking means situated respectively at different points in the machine beyond said breaking means, and operable automatically in the event of the accidental parting of the web, to control the action of the breaking means.

11. In a paper making machine, the combination of means for feeding the paper web, a fluid blast means for causing the break of the web, and means controlled by the paper web for actuating said fluid blast means.

12. In a paper making machine, the combination of means for feeding the paper web, a fluid blast means for causing the break of the web, and means controlled by the accidental parting of the web, for actuating the blast means.

13. In a paper making machine, the combination of means for feeding the paper web, a fluid blast means operable to cause the break of the web at a point in the machine between the couch roll and the first press, and means operable automatically in the event of the accidental parting of the web, to control the actuation of said blast means.

14. In a paper making machine, the combination of means for feeding the paper web, electrically operated means for causing the break of the web, and means operable in the event of the accidental parting of the web, to initiate the action of the electrically operated means.

15. In a paper making machine, the combination of means for feeding the paper web, electrically operated means for causing the break of the web, a contactor circuit for controlling the operation of said electrical means, and a switch in said circuit for controlling the latter.

16. In a paper making machine, the combination of means for feeding the paper web, electrically operated means for causing the break of said web, a normally open contactor circuit adapted when closed to cause the operation of the breaking means, and means operable automatically in the event of the accidental parting of the web, to close said circuit.

17. In a paper making machine, the combination of means for feeding the paper web, electrically operated means for causing the break of said web, a contactor circuit for controlling the operation of said electrical means, and a contactor in said circuit adapted to be operated automatically to control said circuit, by the accidental parting of the web.

18. In a paper making machine, the combination of means for feeding the paper web, electrically operated means for causing the break of the web, a contactor circuit for controlling the operation of said electrical means, and a plurality of contactors in said circuit disposed at different points in the machine and adapted to be operated automatically independently of each other by the accidental parting of the web, to control said circuit.

19. In a paper making machine, the combination of means for feeding the paper web, electrically operated means for causing the break of the web, a contactor circuit for controlling the operation of said electrical means, and a contactor in said circuit for controlling the same, said contactor being maintained in open position by the tension of the web in its normal travel through the

machine, and being movable to closed position when said tension is relieved on the accidental parting of the web.

20. In a paper making machine, the combination of means for feeding the paper web, electrically operated means for causing the break of the web, a contactor circuit for controlling the operation of said electrical means, and a contactor in said circuit adapted to ground through a web supporting member of the machine and thereby close the circuit, said contactor being prevented from grounding by the presence of the paper web between said switch and said member; whereby on the accidental parting of the web, the passage of the trailing end of the web from between the member and contactor, will permit the latter to contact with the member and thereby close the circuit.

21. In a paper making machine, the combination of means for feeding the paper web, electrically operated means for causing the break of the web, a contactor circuit for controlling the operation of said electrical means, and a contactor in said circuit cooperative with the web at the point where it passes from one press felt to the next and adapted to be operated to control said circuit, by the accidental parting of the web.

22. In a paper making machine, the combination of means for feeding the paper web, electrically operated means for causing the break of the web, a contactor circuit for controlling the operation of said electrical means, and a contactor in said circuit cooperative with the paper web on a drying cylinder and adapted to be operated to control said circuit, by the accidental parting of the web.

23. In a paper making machine, the combination of means for feeding the paper web, electrically operated means for causing the break of the web, a contactor circuit for controlling the operation of said electrical means, a contactor in said circuit cooperative with the web at the point where it passes from one press felt to the next, and a second contactor in said circuit cooperative with the paper web on a drying cylinder, said contactor being adapted to be operated to control said circuit by the accidental parting of the web.

24. In a paper making machine, the combination of means for feeding the paper web, electrically operated means for causing the break of the web, a contactor circuit for controlling the operation of said electrical means, and contactors in said circuit cooperative with the web respectively in its passage from the first to the second press felt, and from the second to the third press felt, and adapted to be operated to control said circuit by the accidental parting of the web.

25. In a paper making machine, the combination of means for feeding the paper web, electrically operated means for causing the break of the web, a contactor circuit for controlling the operation of said electrical means, contactors in said circuit cooperative with the paper web on a plurality of the drying cylinders respectively, said contactors being adapted to be operated to control said circuit by the accidental parting of the web.

26. In a paper making machine, the combination of means for feeding the paper web, electrically operated means for causing the break of the web, a contactor circuit for controlling the operation of said electrical means, contactors in said circuit cooperative with the web respectively at the points where it passes from the first press felt to the second press felt, and from the second press felt to the third press felt, and additional contactors in said circuit cooperative with the paper web respectively on a plurality of the drying cylinders, said two groups of contactors being adapted to be operated to control the circuit by the accidental parting of the web.

27. In a paper making machine, the combination of means for feeding the paper web, and means adapted to be brought into action by the accidental parting of the web, said means acting to automatically deflect the path of travel of the web from its normal.

28. In a paper making machine, the combination of means for feeding the paper web, and means adapted to be brought into action by the accidental parting of the web, said means acting to automatically deflect the path of travel of the web from its normal at a point between the forming wire and the first press.

29. In a paper making machine, the combination of means for feeding the paper web, controllable means for causing the break of said web at a given point in the machine, and controlling means for the breaking means cooperating with the paper web in its passage from one press felt to the other and adapted to be operated by the accidental parting of the web, to control said breaking means.

30. In a paper making machine, the combination of means for feeding the paper web, controllable means for causing the break of said web at a given point in the machine, and controllable means for said breaking means cooperating with the paper web on a drying cylinder and adapted to be operated by the accidental parting of the web to control said breaking means.

31. In a paper making machine, the combination of means for feeding the paper web, a fluid blast nozzle adapted to direct a fluid blast against the web, and means operated automatically by the accidental parting

of the web to cause said blast to impinge against the web to cause the break of the same.

32. In a paper making machine, the combination of means for feeding the paper web, a fluid blast nozzle adapted to direct a fluid blast against the web, a normally closed valve to shut off the blast, and means operated automatically by the accidental parting of the web, to open said valve to discharge the blast.

33. In a paper making machine, the combination of means for feeding the paper web, a fluid blast nozzle adapted to deliver a blast against the paper web at a point between the couch roll and the first press, and means operated automatically by the accidental parting of the web to cause said blast to impinge against and cause the break of the web.

34. In a paper making machine, the combination of means for feeding the paper web, a fluid blast nozzle adapted to direct a fluid blast against the traveling web, a normally closed valve to control the discharge of the blast, electrically operated means for opening the valve, and means operable in the event of the accidental parting of the web to initiate the action of the electrical means.

35. In a paper making machine, the combination of means for feeding the paper web, a fluid blast nozzle adapted to deliver a fluid blast against the traveling web to cause the break of the same, a normally closed valve to control the discharge of the blast, electrically operated means for opening the valve, a contactor circuit including said operating means and adapted when closed to actuate said means, and means operable automatically to close said circuit on the accidental parting of the web.

36. In a paper making machine, the combination of means for feeding the paper web, a fluid blast nozzle adapted to direct a fluid blast against the traveling web to cause the break of the same, a normally closed valve to control the discharge of the blast, electrically operated means for opening the valve, a normally open power circuit including said operating means and adapted when closed to actuate the same to open the valve, electrically operated controlling means for said power circuit, a normally open contactor circuit for controlling said operating means and adapted when closed to actuate the same to close the power circuit, and means operated automatically by the accidental parting of the web to close said contactor circuit.

37. In a paper making machine, the combination of means for feeding the paper web, electrically operated means for causing the break of the web, a power circuit including said operating means and adapted to actuate the same, a switch for controlling the power circuit, a switch circuit for operating the switch, a relay for controlling said switch circuit, and a contactor circuit adapted to operate the relay and controlled in its operation automatically by the accidental parting of the web.

38. In a paper making machine, the combination of means for feeding the paper web, electrically operated means for causing the break of the web, a normally open power circuit including said operating means, a normally open switch for closing the power circuit, electrically operated means for holding the switch open, a normally closed switch circuit including said switch holding means and adapted when opened to permit the switch to close the power circuit, a relay controlling said switch circuit and adapted to maintain the same normally closed, a normally open contactor circuit for the relay, and means operated automatically to close the contactor circuit when the web accidentally parts; whereby the switch circuit will be opened and will permit the switch to close the power circuit.

39. In a paper making machine, the combination of means for feeding the paper web, electrically operated means for causing the break of the web, a power circuit including said electrically operated means, a relay for controlling the power circuit, and a contactor circuit controlled automatically by the accidental parting of the web for operating the relay.

40. In a paper making machine, the combination of means for feeding the paper web, electrically operated means for causing the break of the web, a normally open power circuit including said electrically operated means, a relay for closing the power circuit, a contactor circuit controlled automatically by the accidental parting of the web for operating the relay to close the power circuit, and means operating to automatically break the contactor circuit on the closure of the power circuit.

41. In a paper making machine, the combination of means for feeding the paper web, electrically operated means for causing the break of the web, a power circuit including said operating means, a normally open switch for controlling the power circuit, electrically operated means for holding the switch open, a normally closed switch circuit including said switch holding means and adapted when opened to permit the switch to close the power circuit, a relay controlling said switch circuit and adapted to maintain the same normally closed, a normally open contactor circuit for the relay, means operated automatically to close said contactor circuit when the web accidentally parts, and means operated by the power cir-

cuit controlling switch for automatically opening the contactor circuit when said circuit is operated to close the power circuit.

42. In a paper making machine, the combination of means for feeding the paper web, electrically operated means for causing the break of the web, a normally open power circuit including said operating means, electrically operated means for closing the power circuit, a normally closed circuit including said last mentioned operating means adapted when opened to cause the closure of the power circuit, a relay for opening said normally closed circuit, a normally open contactor circuit for the relay adapted to be closed automatically by the accidental parting of the web and thereby open the normally closed circuit, and a manually operated normally closed switch in said normally closed circuit operable independently of the relay, to open said circuit and cause the closure of the power circuit.

43. In a paper making machine, the combination of means for feeding the paper web, electrically operated means for causing the break of the web, a normally open power circuit including said operating means, a switch mechanism for closing the power circuit, electrically operated switch actuating means for said switch mechanism, a normally closed switch circuit including said switch actuating means and operable to normally hold the switch mechanism in a position to maintain the power circuit open, a relay for opening the switch circuit at one point, a normally open contactor circuit adapted to be closed on the accidental parting of the web and thereby automatically operate the relay to open the switch circuit, means operated by the switch mechanism on the closure of the power circuit, to automatically open the switch circuit at another point and to open the contactor circuit and thereby cause the relay to again close the switch circuit at the point where it was opened by the relay, a normally open circuit connected with the switch circuit and branching around the point in said switch circuit opened by the switch mechanism, and a normally open switch in said branch circuit adapted to be operated manually to close the switch circuit and thereby reset the device.

44. In a paper making machine, the combination of means for feeding the paper web, controllable means for causing the break of the web, means for controlling said breaking means, and means adapted to be brought into action automatically by the actuation of the controlling means, and operable to free the forming wire of adhering pulp.

45. In a paper making machine, the combination of means for feeding the paper web, controllable means for causing the break of the web, means for controlling said breaking means, and means adapted to be brought into action automatically by the actuation of the controlling means, and operable to shower the forming wire with cleansing fluid.

46. In a paper making machine, the combination of means for feeding the paper web, controllable means for causing the break of the web, means controlled by the accidental parting of the web to actuate the breaking means, and means brought into action automatically on the parting of the web to free the forming wire of adhering pulp.

47. In a paper making machine, the combination of means for feeding the paper web, controllable means for causing the break of the web, means controlled by the accidental parting of the web to actuate the breaking means, and means brought into action automatically on the parting of the web and operable to shower the forming wire with a cleansing fluid.

48. In a paper making machine, the combination of means for feeding the paper web, and means operative automatically in the event of the accidental parting of the web, to interrupt the feed of the web.

In testimony whereof, I have affixed my signature hereto.

FRANK A. PESCHL.