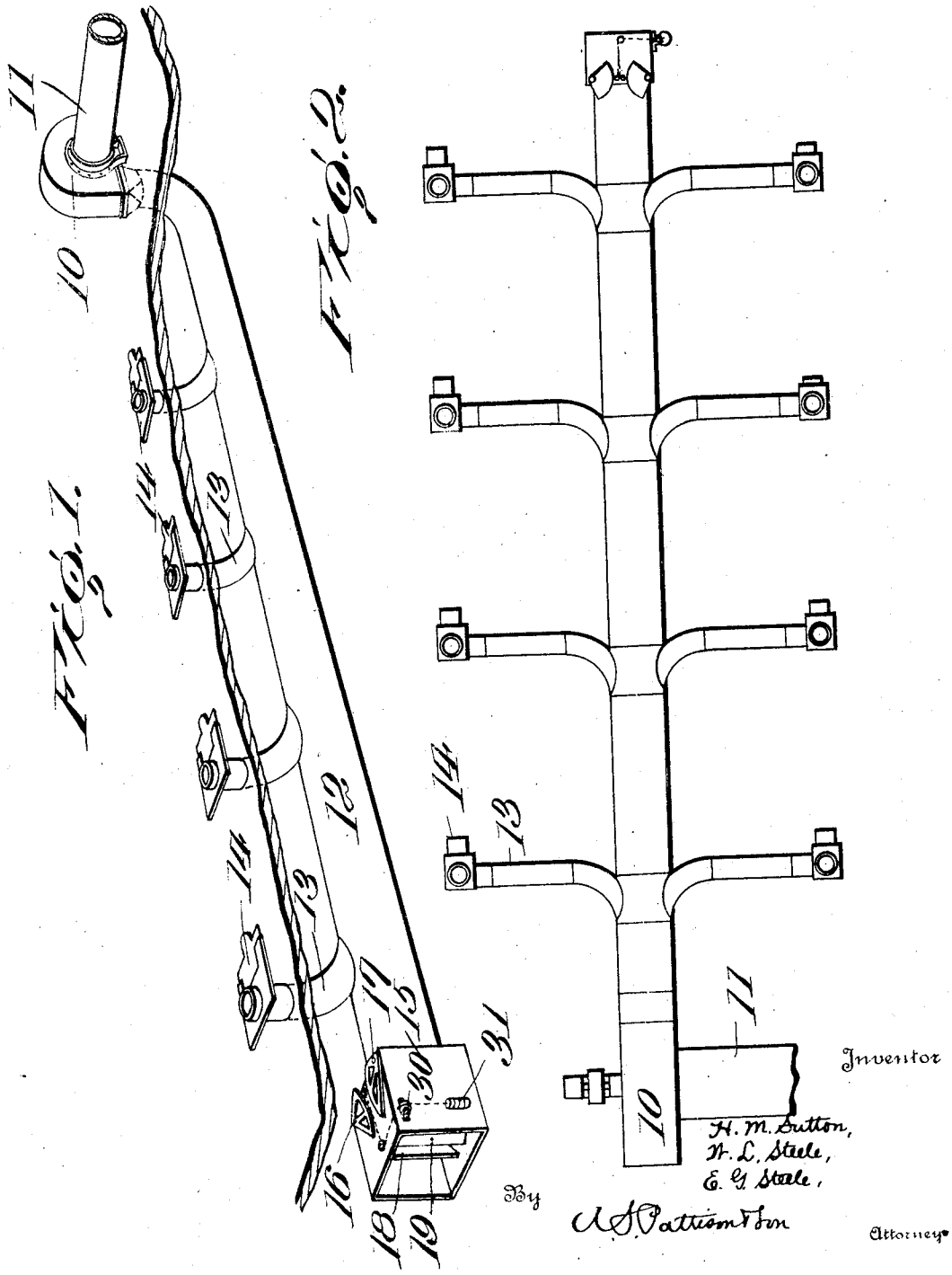
Sept. 8, 1925. 1,553,201

H. M. SUTTON ET AL

ONE-FAN SYSTEM FOR PNEUMATIC DRY CLEANING OR SEPARATING MILLS

Filed Dec. 3, 1923 2 Sheets-Sheet 1



Sept. 8, 1925. 1,553,201

H. M. SUTTON ET AL

ONE-FAN SYSTEM FOR PNEUMATIC DRY CLEANING OR SEPARATING MILLS

Filed Dec. 3, 1923 2 Sheets-Sheet 2

FIG. 3.

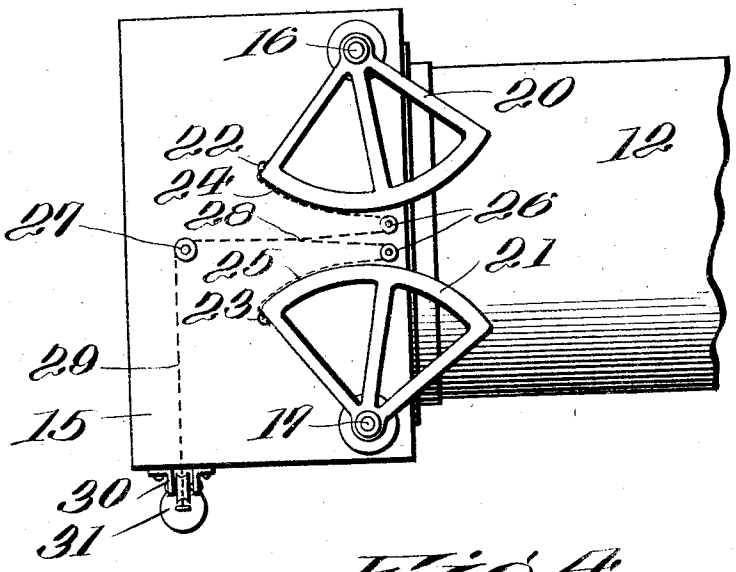
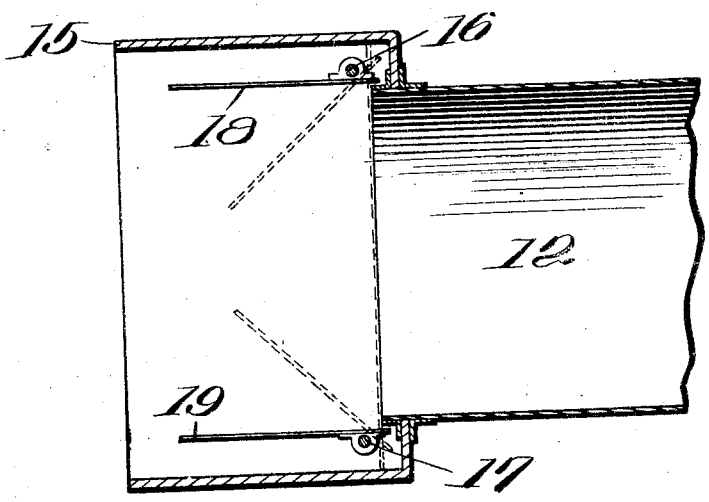


FIG. 4.



Inventor

H. M. Sutton,
H. L. Steele,
E. G. Steele,

By A. D. Pattison & Son

Attorneys.

Patented Sept. 8, 1925. 1,553,201

UNITED STATES PATENT OFFICE.

HENRY MOORE SUTTON, WALTER LIVINGSTON STEELE, AND EDWIN GOODWIN STEELE, OF DALLAS, TEXAS.

ONE-FAN SYSTEM FOR PNEUMATIC DRY-CLEANING OR SEPARATING MILLS.

Application filed December 3, 1923. Serial No. 678,342.

To all whom it may concern:

Be it known that HENRY M. SUTTON, WALTER L. STEELE, and EDWIN G. STEELE, citizens of the United States, residing at Dallas, in the county of Dallas and State of Texas, have invented certain new and useful Improvements in One-Fan Systems for Pneumatic Dry-Cleaning or Separating Mills, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to improvements in a one-fan system for pneumatic dry cleaning or separating mills and relates more particularly to a one-fan system for providing air to a plurality of pneumatic separators or cleaners.

Heretofore it has been the custom to provide a separate fan for each separator or cleaner so that the air used on the particular separator may be closely regulated to suit the work being done. The air used on a separator or cleaner must be closely regulated because that particular separator or cleaner may be used for material of different characters or material of different weight and the amount of tonnage of the material which is being handled by the apparatus.

From this it will be seen that each separating or cleaning unit employed in a mill must be provided with a fan for its air supply. If all of the separators or cleaners of a mill installation were connected direct to one fan of a sufficient capacity to supply the needs of all of the units and if each of these units were regulated to receive its proper air supply it will be seen that any change in the regulation of air supplied to any one particular unit would immediately disturb and change the regulation of air supplied to the other units. A one-fan system of this character would consequently be inoperative when frequent regulation of the air supplied to the several units is necessary.

To state this in another manner let us assume that we have a battery of two or more separating or cleaning units in operation each of which would be operating on different sizes of material and handling a different amount of tonnage. For the proper operation of these several units the air supplied to each separator or cleaner would be necessarily different. One unit might require anywhere from 3,000 to 5,000 cubic feet of air per minute while another of the units might require only from 200 to 500 cubic feet of air per minute while the intervening or remaining units would require air in different amounts in accordance with the size of material and tonnage being handled. It will of course be readily understood that the exact amount of air needed for each unit can be readily regulated by air gates or valves between the unit and the source of air supply but once having secured the close regulation of air needed for each unit any change in this balanced condition by changing the air regulation on any one unit would destroy the air regulation of the other units and thereby upset and spoil the balance of the entire system.

Our invention is designed and built to overcome the difficulties and weaknesses of a one-fan system as described above and our system is so arranged that the air needed for each of the separating or cleaning units is supplied by one fan and the air to each of the units may be regulated when and as desired without disturbing the balance of the system or disturbing the regulation of the air supplied to any of the other units of the battery of separators or cleaners.

The object of our invention is to provide a one-fan system for a battery or plurality of pneumatic separators or cleaners.

Another object of our invention is to provide a one-fan system for a battery or plurality of pneumatic separators or cleaners in which the fan provides an air capacity in excess of the total air required.

Another and further object of our invention is to provide a one-fan system for a battery or plurality of pneumatic separators or cleaners in which there is provided an excess capacity of air over the total air requirements and means for regulating the air supplied for each of the separators or cleaners.

Another and further object of our invention is to provide a system of the character described in which there is an automatic release from the system of air in excess of the air requirements of the several separators or cleaners.

A further object of our invention is to provide a system of the character described which is cheap and simple of manufacture and highly efficient in operation.

Other further objects, and improved results, and novel features of construction of our system will appear in the following description and accompanying drawings.

In the drawings:

Figure 1 is a perspective view of a four unit system.

Figure 2 is a plan view of our system for two batteries of separators or cleaners, each battery composed of four units.

Figure 3 is a plan view of our automatic relief valve.

Figure 4 is a horizontal section of our automatic relief valve.

Referring now to the drawings:

10 indicates a fan which may be of any type desired and may be driven in any manner convenient. The fan 10 is provided with an air inlet pipe 11 and discharges into the air conduit 12 from which lead off the several supplemental air conduits 13 which provide air to the several separators or cleaners, (not shown), located preferably above the main conduit.

We have located in each of the supplemental conduits 13 a regulating gate or valve 14 for controlling the air supply to each of the units. The position of this valve or regulating gate is not material in so long as it is at some point between the main air conduit and the separator or cleaner to which the air is supplied.

Located at the end of the main air conduit 12 is our automatic release valve which comprises an open ended housing 15 in which are mounted upon the vertical shafts 16 and 17 the two gate valves 18 and 19. The upper ends of the shafts 16 and 17 extend through the top of the housing 15 as clearly appears in the drawings and carry upon their ends the segments 20 and 21 which are fastened as at 22 and 23 to the ends of the straps or chains 24 and 25. These chains 24 and 25 are carried around the pulleys 26 and forward towards the pulley 27. At a point 28 the chains meet and merge into a single chain 29 which passes around the pulley 27 before mentioned to the pulley 30 mounted upon the side of the housing 15. Upon the end of the chain 29 is fastened a weight 31.

To make our system operative the main conduit 12 must be of sufficient size to provide capacity for the desired number of outlets to the several separator or cleaner conduits. The fan must be of a size to provide an amount of air in excess of the maximum air capacity of the several separating or cleaning units of the battery.

From the foregoing it will be seen that the operation of the system is as follows:

The fan is driven and supplies to the conduit 12 air in excess of the amount needed for the several separator or cleaning units. Air to each of the units is adjusted through the medium of the valves or regulating gates 14 to provide to the unit a volume of air needed for its work, the total volume of air consumption of the entire battery of units being less than the volume of air supplied by the fan. The excess air volume over that being used by the several units opens the gates 18 and 19 of the automatic exhaust or relief valve and passes to the atmosphere or to waste. Should any adjustment of any air volume to any particular unit be desired this is accomplished by means of the regulating gate 14 of the unit. Should the adjustment be to provide more air to the unit this additional volume is drawn from the excess in the main conduit 12 but should this adjustment be to reduce the volume to the unit this would throw back into the main conduit 12 an additional excess which would cause the gates 18 and 19 of the automatic relief valve to open further and thus pass more air to waste. It will be seen then that the greater the volume of air used the nearer the exhaust valve gates are closed and that the gates of the automatic valve open as the volume of air consumed by the several units is reduced.

The weight 17 is of such a size as to position the exhaust valve gates to maintain within the main conduit 12 the maximum pressure or air volume available from the fan. As the maximum air capacity of the fan is greater than the capacity of all the units it will be seen that the gates must always be open to allow escapement of air to waste.

To prevent a useless escape of air to waste, the total capacity of air volume of the units and the total capacity of air volume of the fan should be made very close. This can be done without affecting the efficiency of the system because occasions would be very few when all of the units would be set at the same time so as to utilize their full air capacity.

From the foregoing it will be seen that we have provided a highly efficient one-fan system for providing air to a battery of pneumatic separators or cleaners.

The drawings set forth one manner of building and utilizing our system but we do not limit ourselves to the particular construction shown in the drawings. The particular construction of the automatic relief valve could be changed in many ways without departing from the spirit of our invention.

To make our system a success it is only necessary that there be provided three features, namely:

1, the use of a fan with capacity in excess of the total air requirements; 2, air regulating means at each of the separating or cleaning units; 3, the automatic release

from the system of air in excess of the amount used by the separating or cleaning units. So long as these three features are incorporated in a system it is immaterial what manner or form they take.

It is our desire and intention to protect the above enumerated three features which make up a successful one-fan system for a plurality of separating or cleaning units.

Having thus described our invention what we desire to protect and secure by Letters Patent is:

1. A one fan system for a plurality of pneumatic separators or the like, comprising a fan with an air capacity in excess of the total air requirements, an air conduit, and automatic means for releasing from the system air in excess of the amount of air used by the separators.

2. A one fan system for a plurality of pneumatic separators or the like, comprising a fan with an air capacity in excess of the total air requirements, an air conduit, means for regulating the air supply to each of the separators or units, and automatic means for releasing from the system air in excess of the amount of air used by all of the separators or units.

3. A one fan system for a plurality of pneumatic separators or the like, comprising a fan with an air capacity in excess of the total air requirements, a main air conduit, supplemental air conduits for each separator or unit, means for regulating the air supply to each of the separators or units, and automatic means for releasing from the system air in excess of the amount consumed by all the separators or units.

4. A one fan system for a plurality of pneumatic separators or the like, comprising a fan with an air capacity in excess of the total air requirements, an air conduit, means for regulating the air supply to the separators or units, automatic means for releasing from the system air in excess of the amount used by all of the separators or units, said automatic means comprising a relief valve composed of a pivotally mounted door normally held against the air escape.

5. A one fan system for a plurality of pneumatic separators or cleaners, comprising a fan with an air capacity in excess of the total air requirements, an air conduit, means for regulating the air supply to each of the separators or units, automatic means in communication with the air conduit for releasing from the system air in excess of the amount used by all of the separators or units, said release valve comprising a pivotally mounted door normally held against the air escape by means of a weight.

6. A one fan system for a plurality of pneumatic separators or the like, comprising a fan with an air capacity in excess of the total air requirements, a main air conduit, supplemental air conduits for each separator or unit, means for regulating the air supply of the supplemental conduits to each separator or unit, automatic means for releasing from the system air in excess of the amount used by all of the separators or units, said automatic means comprising a valve weighted to normally retard the air escape through the valve.

7. A one fan system for a plurality of pneumatic separators or the like, comprising a fan with an air capacity in excess of the total air requirements, means for regulating the air supply to each separator or unit, automatic means for releasing from the system air in excess of the amount used by the separators or units, said automatic means adapted to allow an air escape at all times and automatically adjustable to increase or decrease said air escape in proportion to the air consumption of the separators.

8. A one fan system for a plurality of pneumatic separators or the like, comprising a fan with an air capacity in excess of the total air requirements, a main air conduit, supplemental air conduits for each separator or unit, means for regulating the air supply to each of the separators or units, automatic means for releasing from the system air in excess of the amount used by the separators or units, said automatic means operating to always allow an air escapement in the system and to regulate such air escapement in proportion to the air consumption of the separator.

9. A fan system for pneumatic separators comprising a conduit having outlets to be connected with the separators, a fan having its outlet connected with the conduit, the fan having a capacity in excess of the total requirements of the separators, the conduit having a regulator controlled by the air of the fan, whereby the pressure is kept uniform in the conduit.

10. A fan system for pneumatic separators comprising a conduit having outlets adapted to be connected with the separators, a fan having its outlet connected with said conduit and its inlet disconnected from the conduit, the conduit having pressure regulating means operated by the air pressure of the fan whereby a uniform pressure is maintained in the conduit.

11. A fan system for a plurality of pneumatic separators comprising a conduit having openings to be connected with the separators, manually operated valves in the said openings, a fan having its outlet connected with the said conduit, the conduit having pressure means operated by the air from the fan to maintain a uniform pressure within the conduit irrespective of the ad-

justment of the said manually operated valves.

12. A fan system for pneumatic separators comprising a conduit having openings to be connected with the separators, a fan having its outlet connected with the conduit, said conduit having means operated by the air from the fan comprising a gate adapted to swing in the direction of air pressure.

13. A fan system for pneumatic separators comprising a conduit having openings to be connected with the separators, the fan having its outlet connected with the said conduit, of a regulating valve for the pressure comprising two gates caused to swing by the air pressure in the direction thereof.

In testimony whereof we hereunto affix our signatures.

HENRY MOORE SUTTON.
WALTER LIVINGSTON STEELE.
EDWIN GOODWIN STEELE.