

J. W. STULTS.
 MULTIPLE TANK WASHING MACHINE.
 APPLICATION FILED APR. 7, 1919.

1,360,464.

Patented Nov. 30, 1920.

2 SHEETS—SHEET 1.

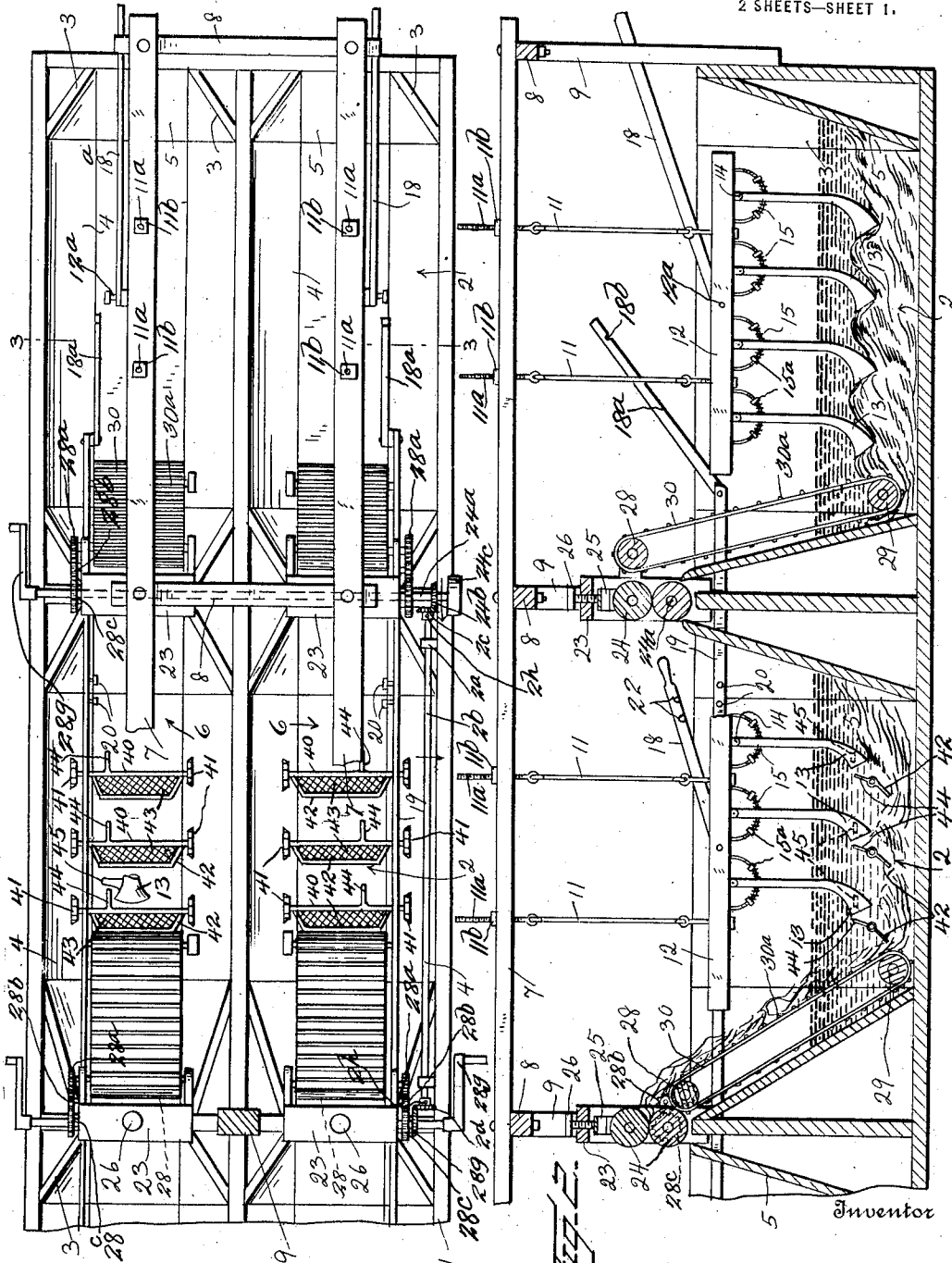


Fig. 1.

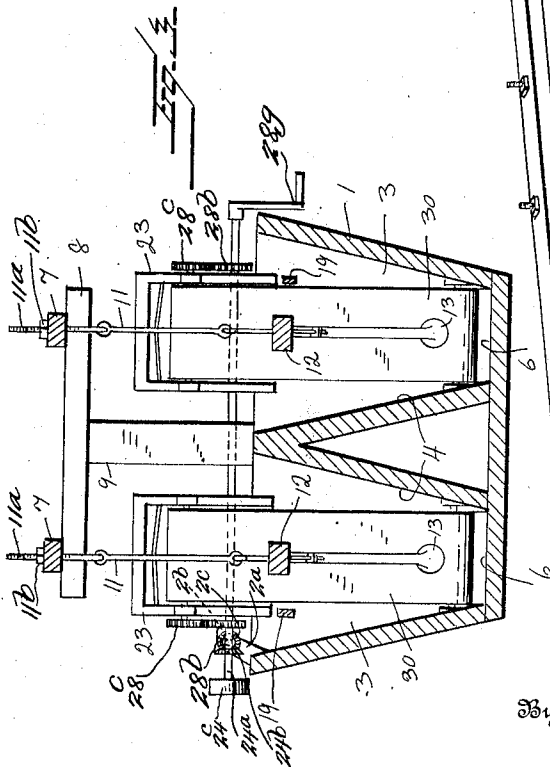
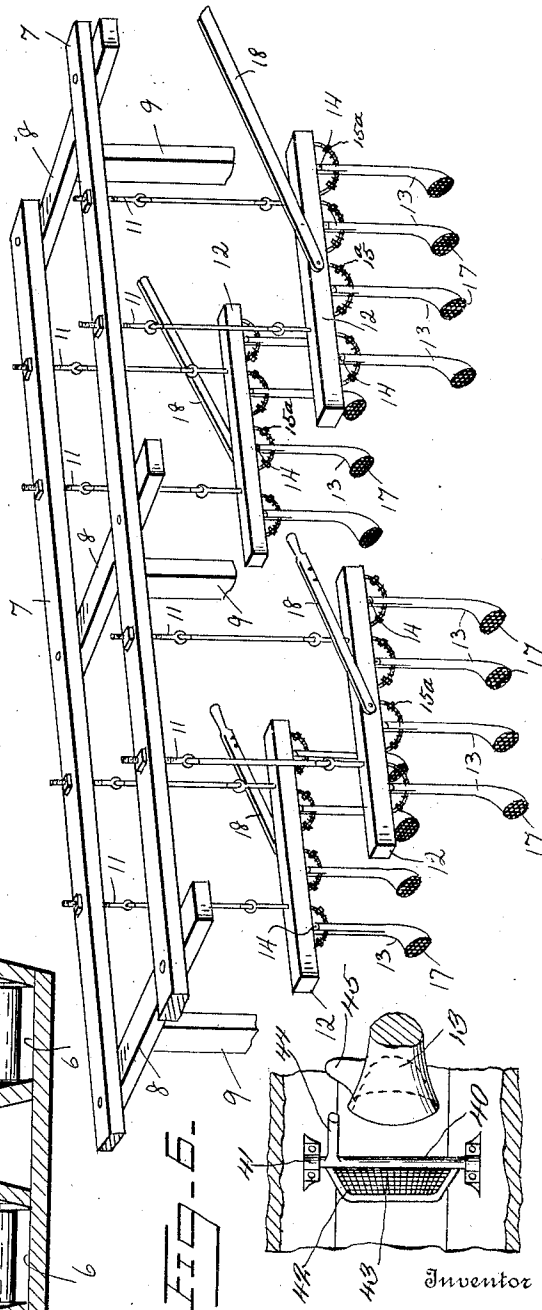
Fig. 2.

J.W. Stults

Watson E. Coleman
 Attorney

1,360,464.

2 SHEETS--SHEET 2.



Inventor

J.W. Stults

Wm. Watson E. Coleman
Attorney

UNITED STATES PATENT OFFICE.

JOHN W. STULTS, OF JOPLIN, MISSOURI.

MULTIPLE-TANK WASHING-MACHINE.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, JOHN W. STULTS, a citizen of the United States, residing at Joplin, in the county of Jasper and State of Missouri, have invented certain new and useful Improvements in Multiple-Tank Washing-Machines, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to an improved multiple tank washing apparatus.

An object of the invention is to provide a machine of this kind for facilitating the washing and rinsing of clothes.

The invention further aims to include a plurality of agitating members for imparting agitation to the clothes longitudinally of the tanks, there being means whereby the agitators may be actuated individually or simultaneously, in other words, the actuation of one agitator imparts movement to the others.

The invention further aims to provide improved rinsing means for the clothes after having been washed, in combination with means for feeding the clothes upwardly toward and to be operated upon by the rinsing means.

While the design and construction at present illustrated and set forth is deemed preferable, it is obvious that it is susceptible to changes, when reducing the device to a practical form for commercial purposes. The right to these changes is claimed, provided they fall within the scope of what is claimed.

The invention comprises further features and combination of parts as hereinafter set forth, shown in the drawings, and claimed.

In the drawings:

Figure 1 is a plan view of the improved washing machine constructed in accordance with the invention.

Fig. 2 is a longitudinal sectional view through one series of clothes receiving tanks, showing the agitating means therein, and the rinsing means at the ends of the tanks.

Fig. 3 is a transverse sectional view on line 3—3 of Fig. 1.

Fig. 4 is an enlarged detail view of the agitating means removed.

Fig. 5 is a vertical sectional view through a portion of one of the tanks, showing the elevator belt inclined not quite as much toward the tanks as is shown in Fig. 2, and

showing the upper roll of the elevator belt adjacent the lower roll of the wringer, and also illustrating additional means for agitating the clothes and the suds.

Fig. 6 is a horizontal view of a portion of one of the tanks, showing the additional means therein for agitating the suds and the clothes.

Referring more especially to the drawings 1 designates a frame constructed as shown to provide a plurality of clothes receiving compartments, in which the suds and the clothes are placed. The corners of the compartments have partitions or corner pieces 3, adapted for guiding the clothes under the agitating members of the agitating mechanism. Each compartment 2 is elongated and is provided with side and end walls 4 and 5 inclined downwardly to an elongated narrow bottom 6.

Arranged on the casing 1 longitudinally thereof are elongated strips or beams 7. These beams 7 are supported upon and are secured to the cross-pieces 8, which are in turn supported by the upright posts 9. Depending from the beams 7 are hangers 11 to the lower end of which bars 12 are loosely connected. These bars have extending downwardly therefrom a plurality of agitating members 13, which are hingedly connected to the bars 12 as shown at 14. Spring devices 15 are connected to the agitating members, one upon each side, so urging tension on the agitating members as to hold them substantially vertically downwardly, one spring device neutralizing the other. However, it is obvious that as a reciprocating motion is imparted to the bars 12, the agitating members will immediately, and in turn, agitate the clothes, as well as the suds, and this action has been found to thoroughly clean the clothes.

It is to be noted that the bars 12 are in parallelism, and therefore, a reciprocating motion may be imparted thereto. As the bars 12 are so reciprocated the agitators 13 will agitate the clothing and the suds, and since the agitators at their lower ends are hollow, the hollows being conical, and their lower ends covered with a heavy wire mesh 17, a suction cupping effect will be created on the clothing. In other words, on the forward stroke of the agitators 13, which will yield, the clothing will be moved forwardly,

there being the suction cupping effects created, the suds and water being forced through the clothing, and on the return strokes of the agitators, they will slightly
 5 release the clothing, and in some instances entirely release the clothing, there also being suction cupping effects. Then when the agitators again move forwardly they will again
 10 act upon the clothing in this manner forcing the suds and water therethrough. These actions are successively repeated, and finally the clothing is worked toward and on the belt 30, that is at its lower end. The percolation of the water and suds through the
 15 clothing, caused by the agitating members acts to remove the dirt and cleanse the clothing. It is to be observed that the agitating members have free movements, when motion is imparted to the bars 12, thereby agitating
 20 the clothes. Pivotaly connected to the bar 12 of each agitating means is a lever 18, and slidable in bearings of the frame 1 is an actuating bar 19. This actuating bar 19 is provided with a series of headed studs 20.
 25 One of the levers 18 is provided with notches 22, either one of which is adapted to engage either one of the headed studs carried by the actuating bar 19. Carried by one end of each of the bars 19 is an additional lever
 30 18^a, provided with a notch 18^b, which may engage a pin 12^a carried by one of the bars 12, thereby linking the bars 12 of one set of compartments with the bars 12 in another set of compartments. When the bars 12 of
 35 both sets of compartments are linked in this manner, then it is possible, as will be noted, to grasp the levers 18, whereby reciprocating movements may be imparted to the bars 12 in the rear and those in advance simultaneously. However, either one of the bars
 40 12 may be actuated individually by disconnecting the lever from the actuating bar, so as to agitate the suds, water and clothing in one compartment independent of the
 45 clothing and suds in another compartment, and vice versa.

Arranged on the frame at points intermediate the clothing receiving compartments are wringers 23. These wringers are of
 50 conventional construction, consisting of the wringer rollers 24, between which the clothing is fed, so as to remove the major part of the water and suds from the clothing. One of the wringer rollers of each wringer is
 55 mounted in bearings of an adjustable frame 25, which may be adjusted by means of the hand screw 26, while the other roller of each wringer has its pintles mounted in bearings of the frame of the wringer 23, and since
 60 the upper roller is permitted to yield the clothing will pass between the rollers. Mounted in bearings in projecting arms of the wringer frames, are additional rollers 28, which adjoin the rollers of the wringers.
 65 In the lower part of each compartment at

one end thereof and in bearings a roller 29 is mounted, and passing about this roller and also about the roller 28 is an elevator belt 30. When it is believed that the clothing has been sufficiently washed, the agitating means may
 70 be operated, so as to feed the clothing toward the lower roller 29 in each compartment. If desired, the clothing may be pushed manually toward the lower roller 29 in each compartment sufficiently so that the
 75 clothing may be fed upwardly, either between the belt and the end of one compartment, as shown in the right hand portion of Fig. 2, or elevated on the belt, as shown in the left hand end of Fig. 2.

It is to be noted that each of the rollers 28 on one end thereof has its pintle provided with a gear 28^a, which meshes with an idle gear 28^b, which in turn meshes with the gear 28^c of the upper yieldable roller of the
 85 wringer, so that when motion is imparted to the wringer rollers, motion in turn will be imparted to the belt 30, whereby the clothing may be elevated toward and between the wringer rollers. The upper gear 28^c of the upper wringer roller meshes with the lower gear 28^d of the lower wringer roller. The pintle of the lower wringer roller has the usual crank 28^e.

In the instance where the clothes are lifted on the belt, instead of between the belt and the end of the compartment, the upper roller of the belt is positioned adjacent the lower roller of the wringer. In this case, the idle gear 28^b meshes between the gear of the lower wringer roller and the gear 28^c of the upper roller of the belt, so that motion may be imparted to the belt, whereby the clothes when they reach the upper end of the belt will pass between the wringer rollers.

Obviously, when motion is imparted to the wringer rollers, motion in turn will also be imparted to the elevator belt, and since the clothing is agitated and fed on the belt, the clothing will be elevated toward and between the wringer rollers. Obviously, by this means, it is possible to remove the clothing from each compartment without the operator or washerwoman removing the clothes manually. It is obvious that a washing machine of this character may be increased or decreased in size, by simply increasing or decreasing the number of compartments or receptacles. It is also obvious when increasing the number of compartments it is necessary to increase the number of wringers. The washing machine may be increased in length or width by adding to or taking from the number of compartments.

The hanger rods 11 are suspended from the hanger screw rods 11^a, on which suitable nuts 11^b are threaded. Obviously the nuts 11^b may be adjusted on the hanger screw rods, and by such means the agitator carrying bars 12 may be adjusted vertically, that

is raised or lowered. It is obvious that should the bars 12 be lowered the lower ends of the agitating members 13 will be positioned closer to the bottoms of the clothing receiving compartments or tanks 2, so as to accommodate clothing of less thicknesses. By positioning the bars 12 higher, it is obvious that the spaces between the lower ends of the agitating members 13 and the bottoms of the clothing receiving compartments or tanks may be increased, so as to permit of the reception of a greater quantity of clothing. It is to be understood that in this application such spacing of the agitating member is not to be limited to any particular dimensions, it being clear that such spacing may be increased or decreased as may be desired according to the adjustment of the hanger screw rods. The nuts 15^a are threaded upon the arcuate rods or guides 15^s as shown clearly in Fig. 4. Furthermore, it is obvious that the nuts 15^a may be adjusted, so as to compress the springs 15, or allow them to expand, so that the yieldable urging action of the agitating member may be increased or decreased as the case may be.

In the operation of the agitators, the agitator carrying bars 12 may be reciprocated in a straight line, but it is preferably the aim to operate the agitator carrying bars diagonally, so that a diagonal agitating motion may be imparted to the agitators, it having been found that a better and more efficient effect can be attained on the clothing to remove the dirt and the like. It is also obvious that if desired, the agitator supporting bars 12 may be operated transversely, it being apparent that owing to said bars 12 being suspended by the hangers 11, that the bars are free to so move.

It is evident, that since the present application illustrates a plurality of ringers, one pair centrally of the washing machine, one for each clothing receiving compartment, another pair at one end of the washing machine, one for each of the adjoining clothing receiving compartments, additional wringers can be easily positioned at the other end of the washing machine. By this statement in this specification, the use of the wringers is not limited to any particular location on the multiple washing machine.

It is further evident that the feed belts 30 may have their upper ends positioned or connected to the wringer mechanism otherwise than illustrated, just so long as the principle remains, to the effect that the feeding belts are capable of feeding the clothing upwardly and between the wringer rolls. For instance, the upper ends of the belts may be connected to rollers or rolls adjacent the lower wringer roll, and in this case, it is the aim that the upper wringer roll would then be positioned immediately

above the center or the meeting portion between the lower wringer roll and the roll to which the belt is connected, so that the clothing could easily pass off the belt between the wringer rolls.

The lower roller of one of the central wringers is provided with a beveled gear 24^b, and a pulley 24^c, and mounted in bearings 2^a of one of the side walls of one of the tanks of clothing receiving compartments is a line shaft 2^b, the opposite ends of which are provided with beveled gears 2^c and 2^d. The beveled gear 2^c meshes with the beveled gear 24^b, while the beveled gear 2^d meshes with the beveled gear 2^e on the shaft of the lower roll of an adjacent wringer. It is clearly evident that by connecting motive power from any suitable source (not shown) to the pulley 24^c, the adjacent wringers may be operated automatically and simultaneously, instead of manually. However, it is to be noted that the beveled gears 2^c and 2^d are adjustable on the line shaft 2^b owing to the provision of the set screws 2^h. It is clear that by unfastening these set screws, the beveled gears 2^c and 2^d may be adjusted on the line shaft out of mesh with the beveled gears 24^c and 2^e, then a crank may be applied to the shaft 24^a, and the shaft operated manually. The shafts of the other wringers may also be operated manually, or if desired, the other wringers may be actuated automatically, provided the connections, as heretofore described are duplicated on the opposite sides of the multiple washing machine. As shown in Fig. 1, the shaft of the lower wringer roll extends transversely of the two side by side clothing receiving compartments, so that the wringers adjacent both sides of the multiple washing machine may be actuated at one time.

In Figs. 5 and 6 a device is illustrated for agitating the suds and the clothes, in order to facilitate the thorough cleaning of the clothes. This device comprises a transversely disposed shaft 40, which is mounted in bearings 41 on the sides of the clothes receiving compartment. This shaft 40 has a radially extending blade or member 42, which consists of a depending frame and stretched between the frame and the shaft is a piece of wire gauze fabric 43. An arm 44 projects radially from the shaft, and is disposed in the path of a lug 45 which projects laterally from the side of the agitator 13. The blade or member 42 normally assumes the position shown in Figs. 5 and 6, and it is to be observed that when the agitator 13 is in motion, the lug 45 will contact with the arm 44, and rock the shaft, and in which case the blade or member 42 will be oscillated, stirring up or agitating the suds and the clothes, causing the suds and water to be forced through the clothing, thereby cleansing the same. It is to be remembered

that while this additional agitating means is illustrated in Fig. 5, it forms an essential part of the washing machine as illustrated in Figs. 1, 2 and 3. In fact, when the machine is constructed for use this agitating means will be included. However, it is not illustrated in Figs. 1, 2 and 3 due to the fact that its inclusion may complicate the illustrations, for the reason that it is the design of the invention to utilize this agitator between the agitators 13. When the agitators 13 move forwardly, each lug 45 will engage its arm 44 and oscillate the blade or member downwardly. On the reverse movement the blade or member is oscillated in the opposite direction.

The invention having been set forth, what is claimed as new and useful is:

1. In a washing machine, the combination with a frame having clothing receiving compartments, of agitator frames suspended for swinging movement longitudinally in said compartments, agitators pivoted to the agitator frames and depending therefrom, arcuate guide rods carried by the agitator frames and being concentric with the pivots of the agitators and guiding the same, spaced abutments on the arcuate rods upon opposite sides of the agitators, and yieldable springs coöperating between the abutments and the agitators on opposite sides thereof, whereby the agitators may yield in a longitudinal plane parallel with the longitudinal plane of movement of the agitator frames.

2. An agitator for washing machines, comprising a body, a plurality of agitator frames, a plurality of agitators pivotally suspended from the agitator frames and having their lower ends terminating in conical agitator feet provided with agitating wire fabric end pieces, arcuate guide rods carried by the agitator frames and being concentric with the pivots of the agitators, said guide rods engaging through the agitators, abutments on the arcuate rods on opposite sides of the agitators, coil springs engaging the arcuate guide rods on opposite sides of the agitators and coöperating with the abutments, to hold the agitators in uniform substantially perpendicular positions from the agitator frames, to permit the agitators to swing yieldably with respect to the agitator frames.

3. In a washing machine, the combination with a frame having a clothes receiving compartment, of a rocking agitator mounted in said compartment, a reciprocating agitator, a lug carried by the rocking agitator, and means mounted upon the reciprocating

agitator to engage the lug, to impart rocking movements to the rocking agitator.

4. In a washing machine, a dominant frame having a clothes receiving compartment, an auxiliary frame supported on the dominant frame, an agitator frame arranged in said compartment, suspension links adjustably and pivotally connected to the auxiliary frame and in turn connected to the agitator frame, an agitator pivotally suspended from the agitator frame, an arcuate guide rod engaging through the agitator and whose radius extends from the pivot of the agitator, spring means on the arcuate guide rod on each side of the agitator, adjustable abutments on the guide rod to regulate the tension of the spring means, said agitator adapted to protrude downwardly in the compartment and terminating in a curved agitator foot.

5. In a washing machine, a frame having a clothes receiving compartment, a second frame suspended thereon for combined swinging and reciprocating movements, an agitator depending from and being yieldably mounted on the second frame and terminating at its lower end in an agitator foot provided with a lateral lug, a second agitator operatively mounted in the bottom of the clothes receiving compartment for oscillatory movements, and provided with an extension arm positioned in the path of the lug of the foot of the first agitator, whereby as the lug and the arm engage upon reciprocating movements of the first agitator, the second agitator will be oscillated back and forth.

6. In a washing machine, a frame having a clothes receiving compartment, a second frame arranged in the compartment and being operatively suspended on the first frame for swinging and reciprocating movements, an agitator pivotally suspended from the second frame, an arcuate guide rod connected to the second frame and engaging through the agitator and whose radius extends from the pivot of the agitator, yieldable means on the arcuate guide rod upon each side of the agitator, and adjustable abutments on the guide rod for regulating the tension of the yieldable means, said agitator terminating at its lower end in a curved agitator foot.

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

JOHN W. STULTS.

Witnesses:

ROY E. STEPHENS,
SIDNEY C. WESTON.