

Oct. 30, 1951

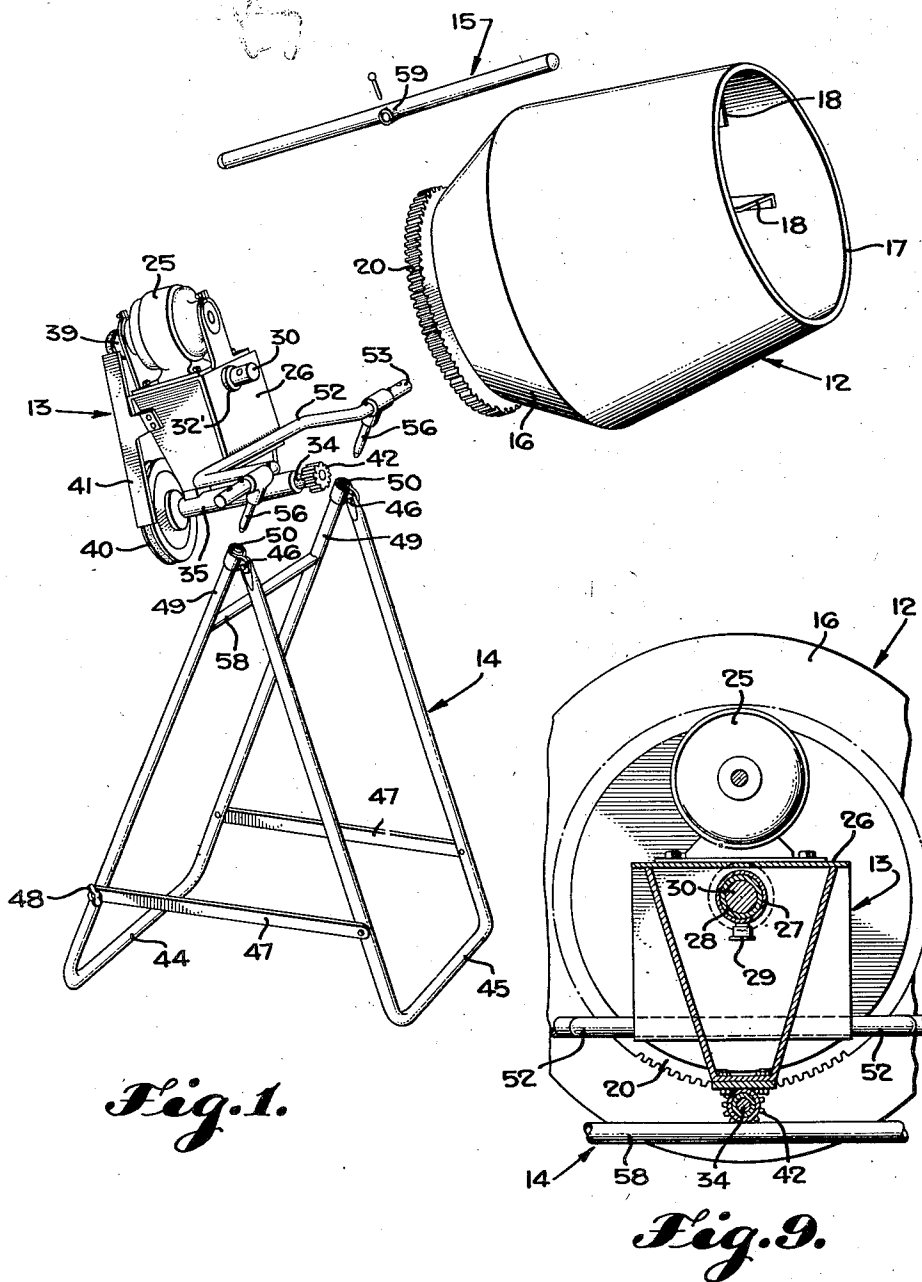
P. ARANT

2,573,296

PORTABLE MIXING MACHINE

Filed June 18, 1948

3 Sheets-Sheet 1



PERRY ARANT,
INVENTOR

BY
Stuart M. Maule
ATTORNEY

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Fig. 2.

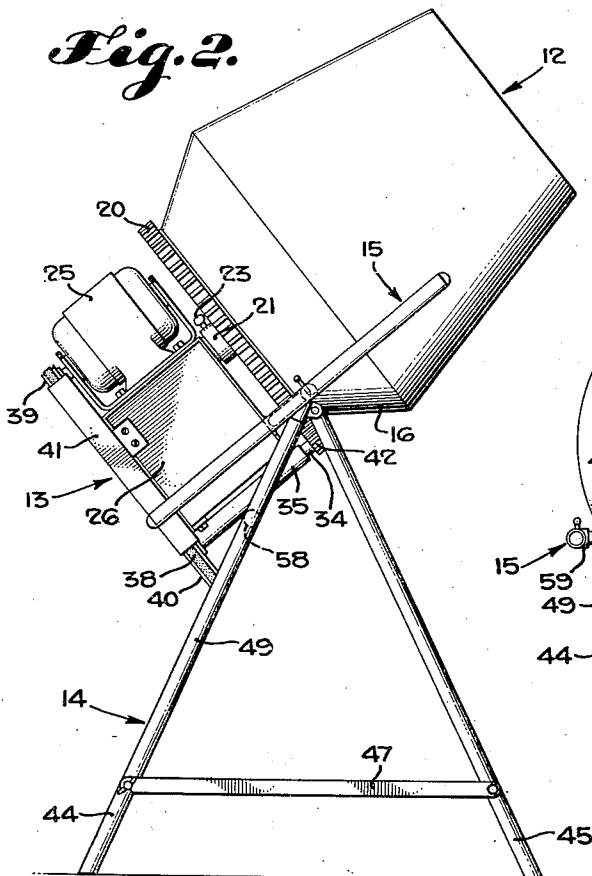


Fig. 3.

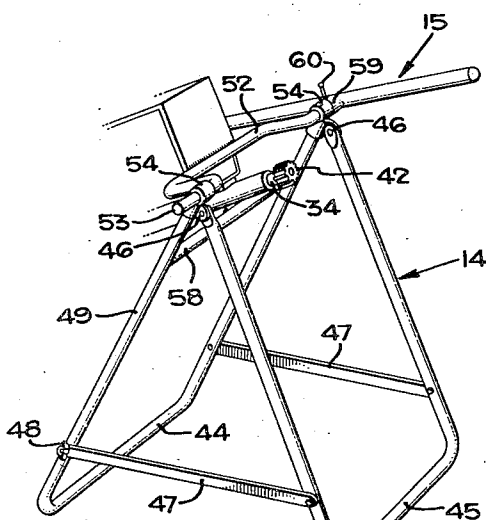
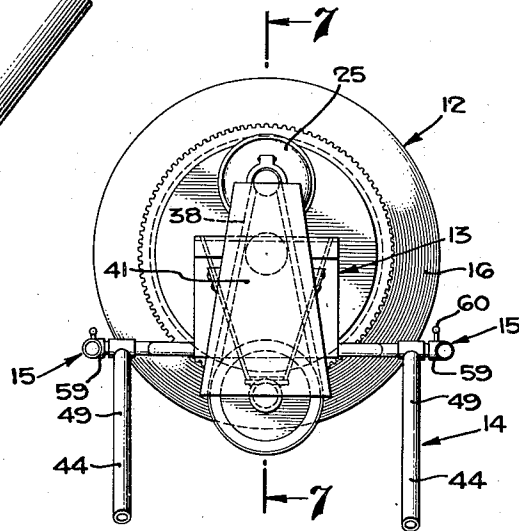


Fig. 4.

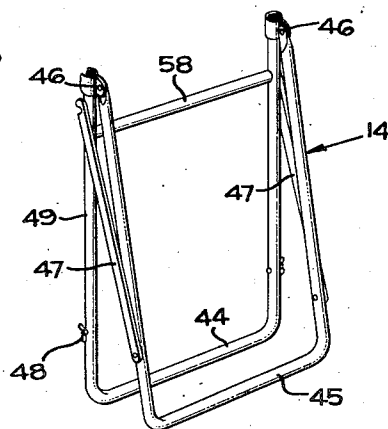


Fig. 5.

PERRY ARANT,
INVENTOR

BY

Stuart M. Maule
ATTORNEY

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3 Sheets-Sheet 3

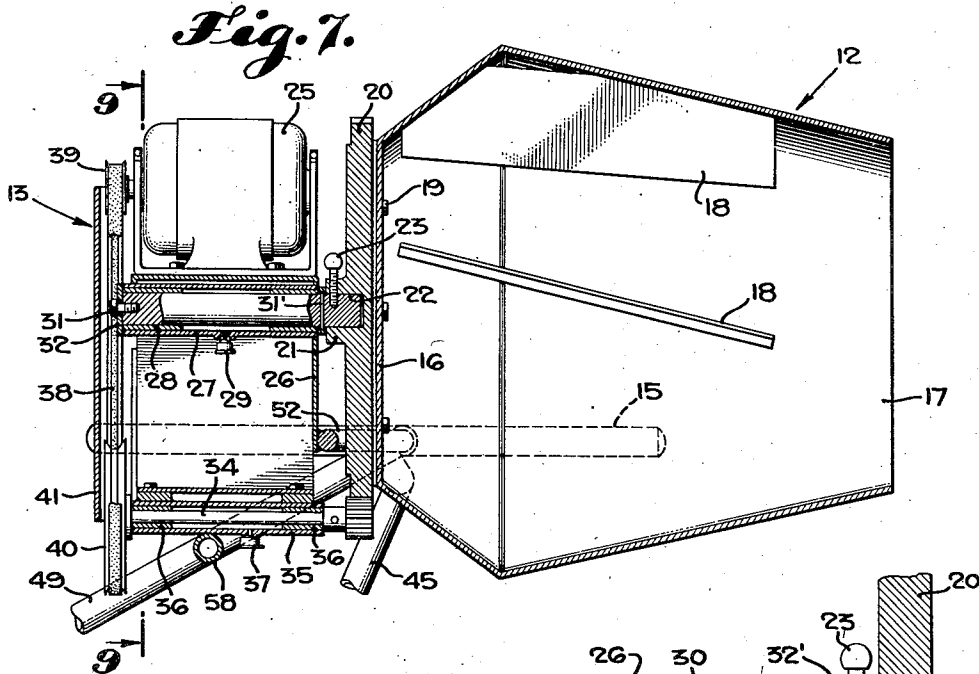
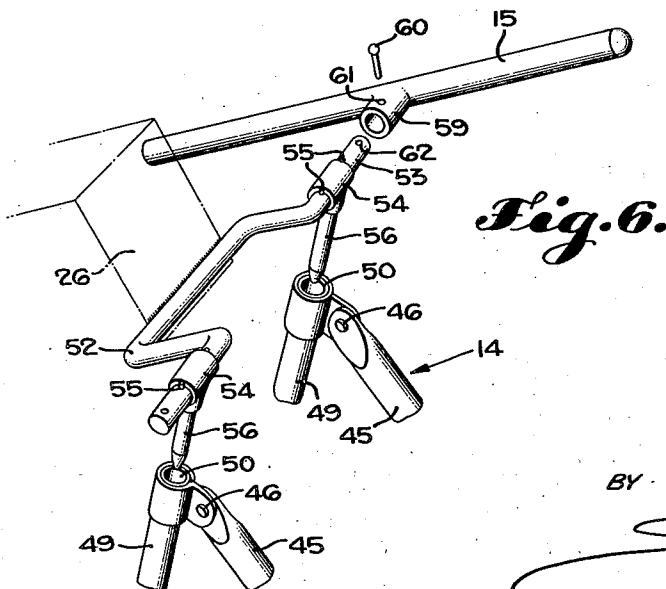
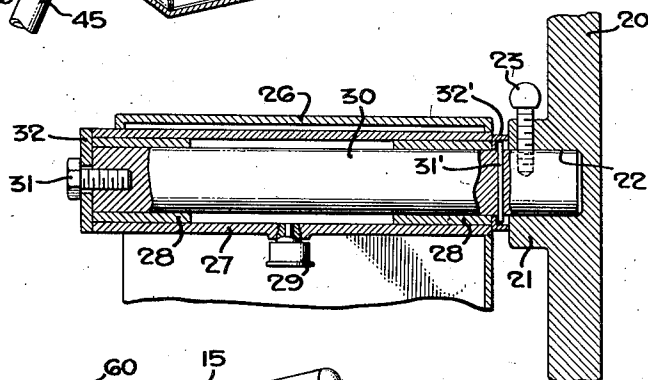


Fig. 8.



PERRY ARANT,
INVENTOR

BY

Stuart M. Maule
ATTORNEY

UNITED STATES PATENT OFFICE

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PORTABLE MIXING MACHINE

Perry Arant, San Gabriel, Calif., assignor to El Sereno Machine Works, Azusa, Calif., a corporation of California

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This invention relates to mixing machinery, and more particularly to machinery having a mixing or tumbling barrel such as is used in mixing cement with rock, gravel, or other aggregate in the formation of concrete or plaster, and in mixing other materials, such as feeds.

An object of my present invention is to provide a mixing machine for general mixing purposes which may be easily disassembled into a few parts which may individually be lifted and transported with convenience, so as to permit portability of the machine while maintaining it at a size permitting substantial mixing capacity.

Another object of the invention is to provide a mixing machine suitable for use within a building, and so constructed that it may be carried in sections to any floor or room where it may be needed, and set up and operated from any electric power outlet, thereby saving the time and labor ordinarily required for transporting mix from distant points.

A further object of the invention is to provide a mixing machine constructed of individually portable parts which in their assembled state are so balanced as normally to seek and maintain a position suitable for mixing, and to be easily tilted to a pouring position when containing a mix.

A further object is so to design the several sections or units of the mixing machine that they are subject to being joined together and operatively interconnected, as well as disconnected and separated from each other, with the utmost ease and without the necessity of using any tools.

The invention possesses other objects and features of advantage, some of which, with the foregoing, will be set forth in the following description of the preferred form of my invention which is illustrated in the drawings accompanying and forming part of the specification. It is to be understood that I do not limit myself to the showing made by the said drawings and description, as I may adopt variations of the preferred forms within the scope of my invention as set forth in the claims.

Referring to the drawings:

Figure 1 is an exploded perspective view of a mixing machine embodying the principles of this invention.

Figure 2 is a side elevational view showing the mixing machine assembled and in mixing position.

Figure 3 is a fragmentary elevational view, looking upwardly and from the left of Figure 2.

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Figure 4 is a perspective view on a slightly reduced scale, showing the supporting stand and motor mount in operating position, portions of the figure being broken away to reduce its size.

Figure 5 is another perspective view of the supporting stand, showing it in partially folded position.

Figure 6 is an exploded perspective view on an enlarged scale, illustrating the pivoting mechanism by which the motor and mixing barrel are pivotally supported by the stand.

Figure 7 is a medial longitudinal vertical sectional view, taken on the line 7-7 of Figure 3 and on an enlarged scale, with the direction of view as indicated, illustrating the mechanism for attaching the mixing barrel to the motor and for driving the mixing barrel from the motor.

Figure 8 is a further enlarged sectional detail of the mechanism shown in Figure 7 for attaching the mixing barrel to the motor.

Figure 9 is a transverse vertical sectional view, taken on the line 9-9 of Figure 7, and on the scale thereof, with the direction of view as indicated, illustrating the gears for driving the mixing barrel from the motor.

Specifically describing that embodiment of my invention which has been chosen for illustration and description herein, my portable mixing machine comprises a mixing barrel 12, a driving mechanism indicated generally at 13, a folding stand 14, and may include suitable leverage means such as a handle 15, all as shown in separated, or exploded, view in Figure 1. The mixing barrel 12 may have the conventional form of conic frustums joined at their wide ends and having a closed head 16 and an open end 17, so as to require downward tilting of the open end 17 to effect a complete discharge of a charge of mixed material. The barrel may also have a plurality of blades 18, preferably diagonally disposed on the inner surface of the barrel for effecting a lifting and turn-over of the mix. Secured to the closed head 16 by bolts 19 is a gear plate 20 having a hub 21 with an axial recess 22 and provided with a set screw 23 adapted to enter the recess 22.

The driving mechanism 13 preferably comprises an electric motor 25 mounted on a box frame 26 although any other type of prime mover, such as an internal combustion engine may be used if desired. The upper portion of the box frame 26 contains a journal box 27 fitted with bearings 28, and having lubrication means such as a grease cup 29, and best shown in Figures 7 and 8. A shaft 30 extends into the journal box

27 and is secured therein by a bolt 31 which holds the inner end of the shaft against the closed end 32 of the journal box which thereby provides an end-thrust bearing for the shaft, restraining the shaft 30 against movement to the right with respect to its bearings 28, as viewed in Figures 7 and 8. Movement of the shaft 30 in the opposite direction with respect to its bearings is prevented by means of a pin 31' extending axially through the shaft and having its ends protruding therefrom into the concave face of a cupped thrust washer 32' contacting the outer end of the associated bearing 28. The outwardly extending end of the shaft 30 is adapted to enter the recess 22 of the gear plate 20 and to be detachably engaged therein by the set screw 23 so as to hold the barrel 12 longitudinally rigid with the driving mechanism 13 as a temporary unit therewith, but rotatable about its longitudinal axis when the shaft 30 is rotated in the journal box 27. This construction has the advantage that the shaft 30 does not extend through the head 16 into the barrel 12, but does have an elongated and lubricated bearing surface in the gearings 28; and the relatively heavy gear plate 20 and hub 21 provide strength for supporting the barrel 12 in coaxial extension of the shaft 30.

The motor 25 drives a shaft 34 which may be secured to the lower face of the box frame 26 by a journal box 35 fitted with a bearing 36 and provided with lubrication means such as a grease cup 37. Driving of the shaft 34 from the motor 25 is preferably effected by a V-belt 38 running on pulleys 39 and 40 and protected by a guard plate 41. A pinion gear 42 is mounted on the shaft 34 so as to mesh with the teeth of the gear plate 20 when the gear plate is mounted upon the shaft 30 and the latter is secured in the journal box 27 by the bolt 31.

The stand 14 is preferably of folding or collapsible construction, as shown in Figures 4 and 5, and may be formed of two U-shaped members 44 and 45 connected at their open ends by hinges 46 and adapted to be braced in extended position by brace bars 47 pivoted on the one member and securable to the other member by wing nuts 48. At least one of the members 44 and 45, which may be the member 44, has its upwardly extending arms 49 of tubular form and open at their upper ends 50.

A supporting bracket 52 is secured, as by welding (see Figure 6), to the box frame 26 and has forwardly and then laterally extending arms 53. Journal boxes 54, which may be simple pipe T fittings, are mounted on the lateral extensions of the arms 53 so as to allow relative swinging or pivotal movement of the bracket 52, and are retained on the arms 53 by pins 55. The journal boxes 54 are provided with support pins 56 extending at right angles to the portions of the arms 53 journaled in the journal boxes. The support pins 56 may be simple spike-like members secured in the T-stems of the pipe T fittings, and are adapted to be inserted in the open tubular ends 50 of the stand 14 to support the driving mechanism 13, and to permit the driving mechanism, or the driving mechanism and the barrel 12 assembled therewith as a temporary unit, to be pivoted in a vertical plane with the arms 53 as an axis.

The arms 53 extend forwardly of the box frame 26 sufficiently to cause their pivotal axis to be so disposed relatively to the center of gravity of the unit formed by the driving mechanism 13 and barrel 12 that the unit is urged by gravity

to an inclination in which the open end 17 of the barrel is directed upwardly to retain a mix within the barrel. A stop, such as a cross bar 58 on the stand 14 engageable with the journal box 35 on the bottom of the box frame 26 or other non-rotating portion of the driving mechanism 13, may be provided to limit the inclination of the barrel 12. The handle 15 may have a tubular side extension 59 by which it may be secured to one of the arms 53 by a pin 60 fitting in holes 61 and 62 to provide leverage by which the end 17 of the barrel 12 may be inclined downwardly against gravity to effect the discharge of mix from the barrel. As is clearly illustrated in Figure 6, the arms 53 are substantially identical and each is provided with one of the holes 62, either of which is adapted to receive the pin 60. Hence, the handle 15 may be mounted in operative position optionally to either side of the apparatus. This makes for greater convenience and adaptability to different working conditions, such as those involving different preferred directions of approach, both while supplying materials to the mixer to be mixed thereby, and in order to receive the completed mix from the mixer.

The mixing machine may be transported in disassembled condition to any place accessible to its individual parts and convenient to the work to be accomplished and there quickly and easily set up and placed in operation. The folding stand 14 may first be set up and braced by the brace bars 47. The driving mechanism 13 may then be assembled upon the stand 14 by placing the spike-like members 56 in the open ends 50 of the stand members 49. The shaft 30 will ordinarily be transported with the driving mechanism 13 as a part thereof, but if removed therefrom it may be inserted in the journal box 27 and secured by the bolt 31. The driving mechanism 13 will swing downwardly upon the axis of the arms 53 until it rests upon the cross bar 58, and the shaft 30 will slide into the journal box 27 and remain there by its own weight until secured by the bolt 31. The barrel 12 may then be placed in position to complete the tiltable driving and mixing unit by engaging the outstanding end of the shaft 30 in the recess 22 and securing it therein by the set screw 23. When the motor 25 is connected to a source of power, the mixing machine is ready for operation in the usual manner.

During the operation of the machine, the barrel 12 will remain tilted with its open end 17 inclined upwardly to receive the materials to be mixed and to retain them during mixing. Through operation of the V-belt 38, shaft 34, pinion gear 42 and plate gear 20, the barrel is caused to rotate, with the shaft 30 rotating in the journal box 27. When a mix is completed, the barrel 12 may be inclined downwardly to discharge the mix by means of the handle 15 while continuing to rotate. When the handle is returned, the barrel will resume its former upwardly tilted position.

I claim:

1. A portable mixing machine comprising a mixing barrel, a driving mechanism, a shaft, means on said barrel for detachably securing said barrel to one end of said shaft coaxially therewith, means on said driving mechanism for rotatably supporting the other end of said shaft, gears on said barrel and on said driving mechanism adapted to mesh when said shaft is so supported by said driving mechanism and said bar-

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rel is so secured thereto, a stand having spaced upwardly extending tubular members open at their upper ends, journal boxes each having a member adapted to be inserted in one of said open upper ends, and means secured to said driving mechanism and journaled in said journal boxes for tiltably supporting said driving mechanism and said barrel as a unit on said stand, said journal boxes being so disposed with respect to the center of gravity of said unit when said barrel contains a normal charge of mix that said barrel is urged by gravity to assume a mix-retaining inclination.

2. A portable mixing machine comprising a mixing barrel, a driving mechanism attachable to said barrel for causing relative rotation thereof, a folding stand having spaced upwardly extending tubular members open at their upper ends, a pair of axially aligned journal boxes, a pin extending radially from each of said journal boxes, each of said pins being removably receivable in one of said open upper ends to removably mount the associated journal box thereon, and means secured to said driving mechanism and journaled in said journal boxes for tiltably supporting said driving mechanism and said barrel on said stand.

3. A portable mixing machine comprising three optionally interengageable or separable units, one of said units comprising a stand having a plurality of upwardly opening sockets, another of said units comprising a driving mechanism and means for releasably mounting it on said stand to be operably supported thereby, said releasable mounting means comprising a plurality of pins carried by said driving mechanism in position for each of said pins to extend downwardly therefrom into one of said sockets whereby said driving mechanism is releasably retained in operating position upon said stand by gravity, and the other of said units comprising a mixing bar-

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rel and means for releasably mounting it on said driving mechanism to be supported and rotated thereby.

4. A portable mixing machine comprising two optionally inter-engageable or separable units, one of said units comprising a driving mechanism including a frame, a pair of spaced, axially aligned bearings carried by said frame, a shaft journaled in said bearings and having one end projecting to an accessible position clear of the remainder of said driving mechanism, a driving gear mounted on said frame for rotation about an axis parallel to and offset from the axis of said shaft, and means for rotating said driving gear, and the other of said units comprising a barrel, a driven gear rigidly affixed to an end of said barrel in coaxial alignment therewith, said gear comprising a central hub having a recess therein adapted to receive said extended end of said shaft therein and a rim operably engageable with said driving gear as said end of said shaft is received within said recess.

PERRY ARANT.

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