

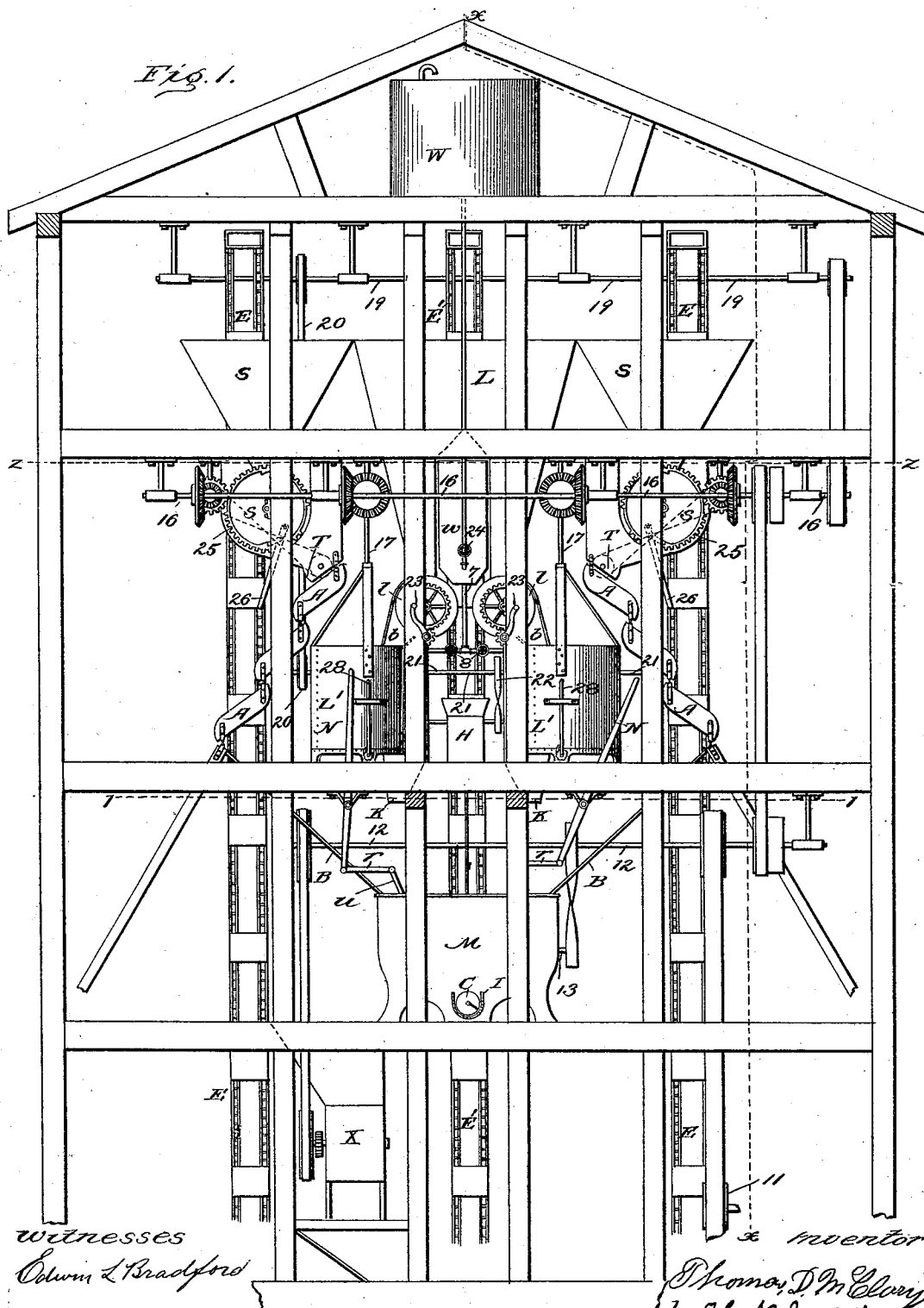
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4 Sheets—Sheet 1.

T. D. McCLARY.
APPARATUS FOR MAKING MORTAR.

No. 521,507.

Patented June 19, 1894.



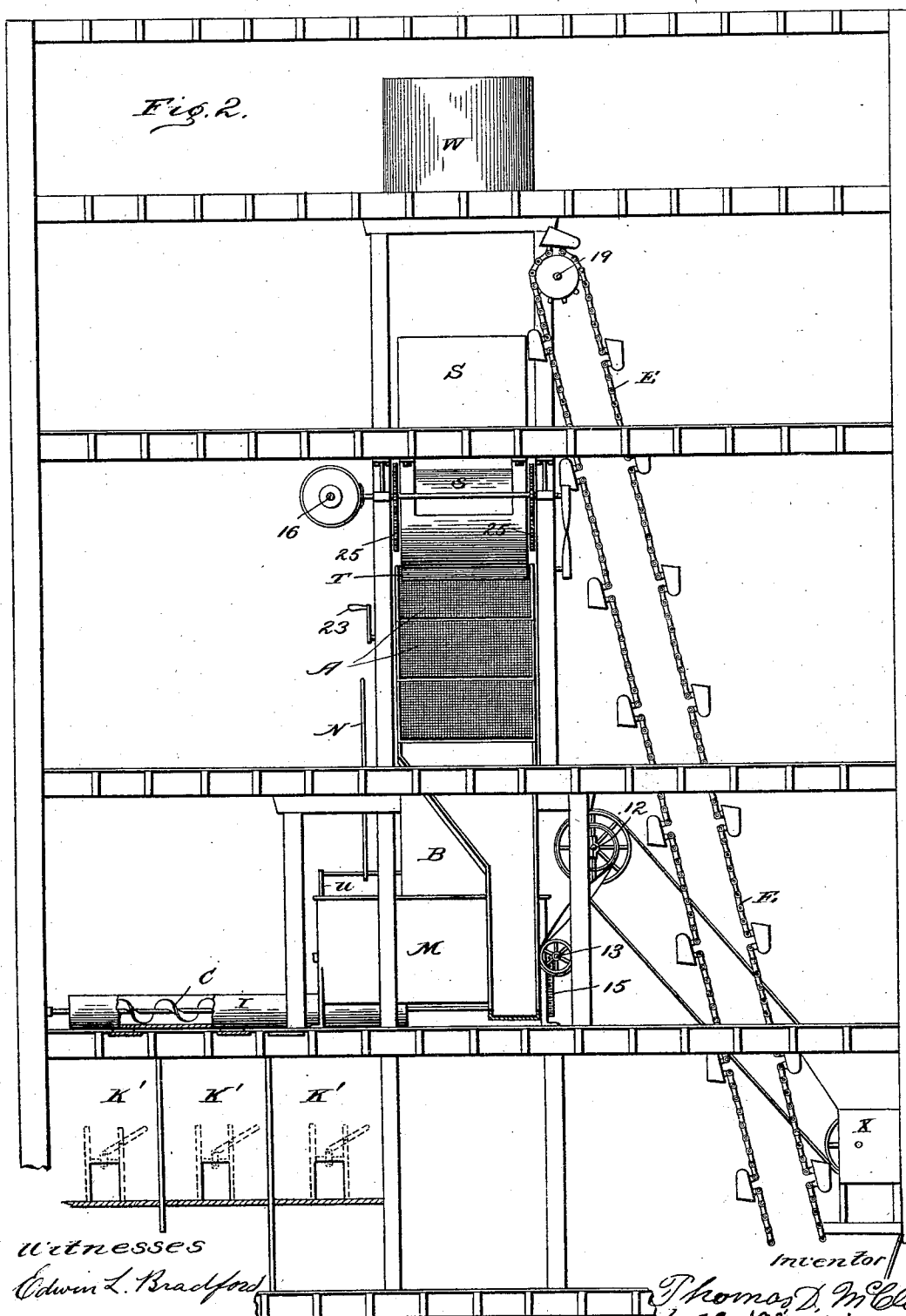
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Witnesses

Edwin L. Bradford

Harry L. Marsh

Inventor

Thomas D. McClary
by H. N. Jenkins,
his Attorney

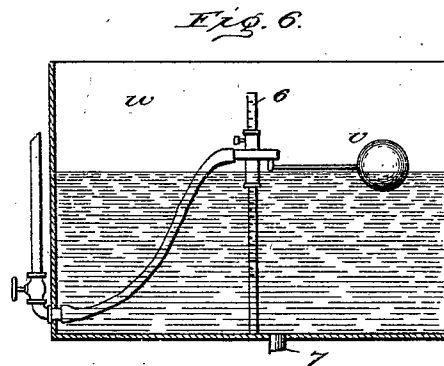
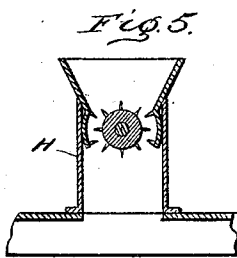
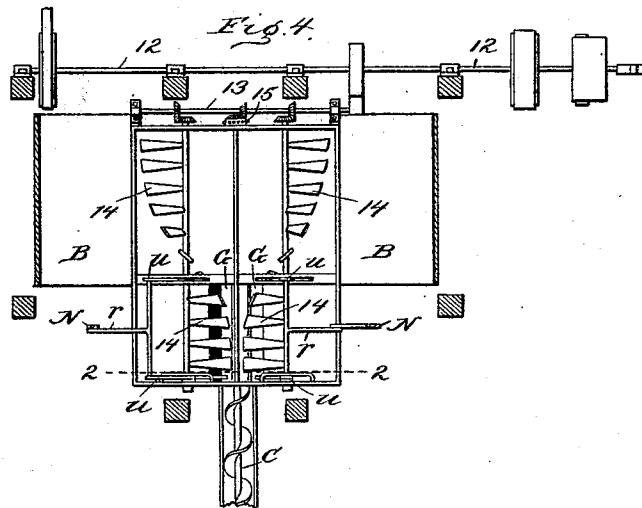
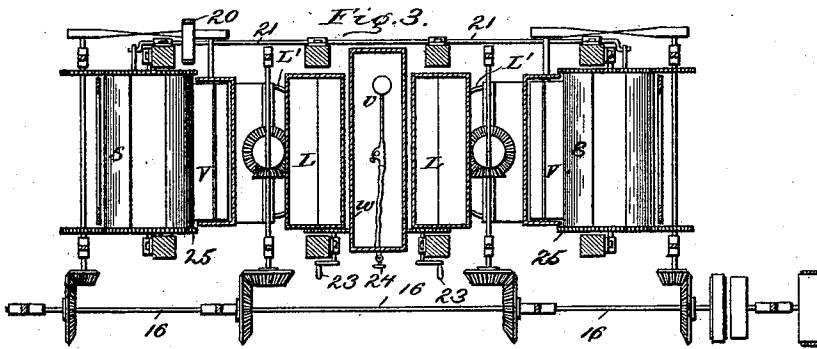
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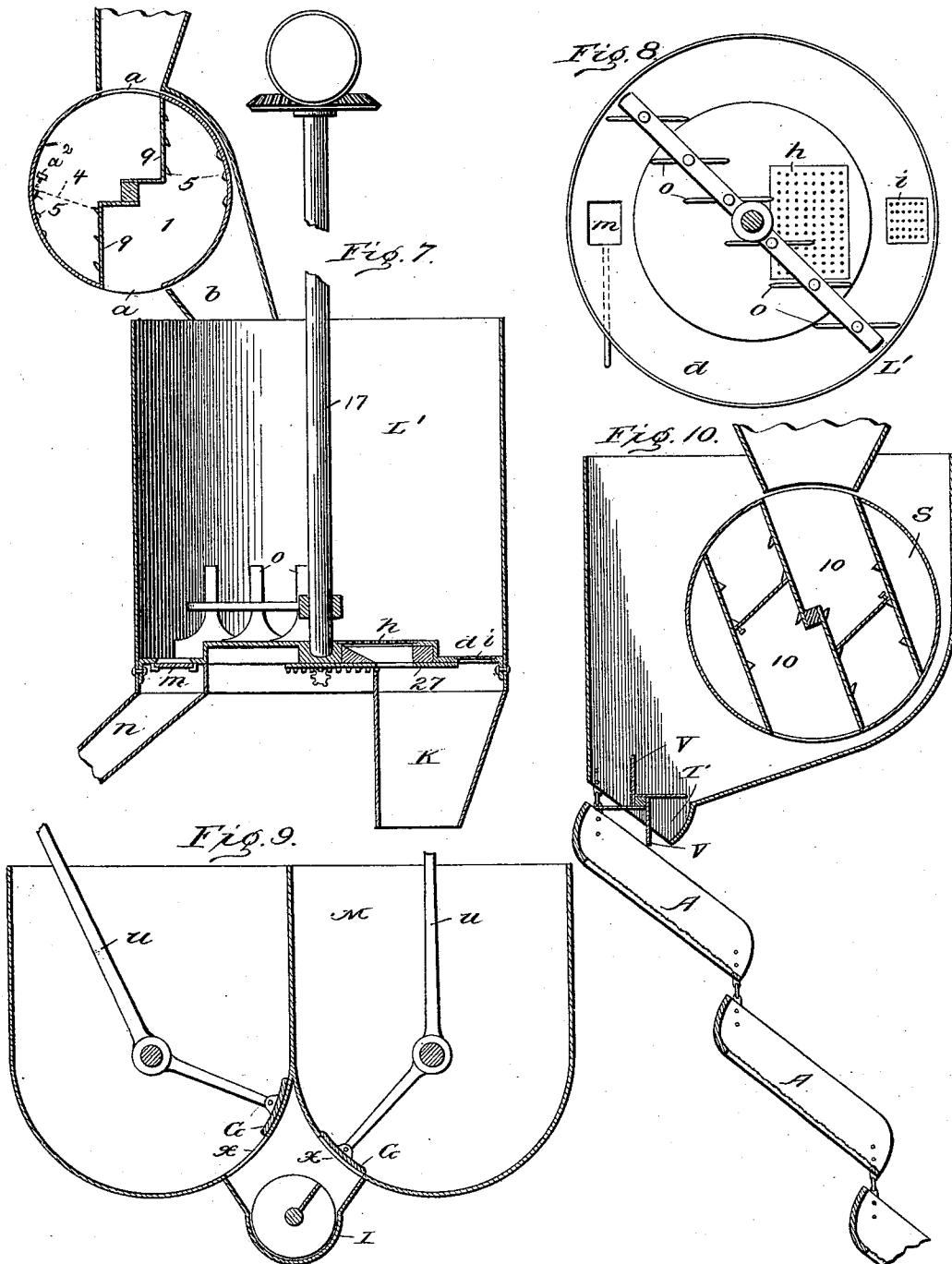
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UNITED STATES PATENT OFFICE.

THOMAS D. McCLARY, OF WASHINGTON, DISTRICT OF COLUMBIA.

APPARATUS FOR MAKING MORTAR.

SPECIFICATION forming part of Letters Patent No. 521,507, dated June 19, 1894.

Application filed May 18, 1893. Serial No. 474,697. (No model.)

To all whom it may concern:

Be it known that I, THOMAS D. McCLARY, a citizen of the United States, residing in the city of Washington, District of Columbia, have invented certain new and useful Improvements in Apparatus for Making Mortar; and I do hereby declare that the following is a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to mortar making apparatus, the object of which is to provide a complete apparatus or set of machines for handling, proportioning and mixing the ingredients of mortar and thereby economically obtain a constant quality and a superior product.

The invention consists in certain combinations of machines and instrumentalities hereinafter described and claimed.

In my new organization and apparatus, many old devices and machines for performing different steps in the complete process of making mortar may be used, and I therefore do not limit myself in the general combinations to the special construction of any one of the parts embraced in said combinations, as any conventional means for performing the functions of the several machines or instruments are for the purposes of this application the equivalents of other instruments or machines which will accomplish the same result.

In the drawings, Figure 1 is an elevation of a suitable structure and of instrumentalities arranged within and upon the same, illustrating my invention. Fig. 2 is a sectional elevation of the same, on the line $x-x$ of Fig. 1. Fig. 3 is a horizontal section, taken on the line $z-z$ of Fig. 1. Fig. 4 is also a horizontal section taken on the line 1-1 of Fig. 1. Fig. 5 is an enlarged sectional view of a hair-picker. Fig. 6 is an enlarged sectional view of a water meter adapted for my purposes. Fig. 7 is an enlarged sectional view of an adjustable lime meter and slaker. Fig. 8 is a top or plan view of the slaker. Fig. 9 is a horizontal section on the line 2-2 of Fig. 4, showing the gate or cut-off of the mortar mixer, and Fig. 10 is a sectional view of the sand meter, feed-regulator and screens.

The structure or support of the apparatus is, by preference, provided with five floors. On the top floor is supported a water tank W for supplying water under a head for distribution. Obviously, any other source of supply is the equivalent of this tank. The fourth floor supports sand bins or hoppers S and lime bins or hoppers L, and beneath this floor are suspended sand meters s , water-meters w and lime meters l . Lime slakers L' and hair-picker H are supported on the third floor and the mortar mixers M and the conveyer C for discharging the mortar are located on the second floor. The sand-meter s is located below the sand bins and discharges on to shaking screen A, and thence over chute B to mixer M. The lime meter l is also located below the lime bin and discharges to slaker L' . A lime crusher X is located at a suitable point to discharge the crushed lime into an elevator well convenient for elevation to the hopper above.

E is an elevator for hoisting sand from a well located, by preference, below the first floor, to bins or hoppers S on the fourth floor and E' is the lime elevator for a similar purpose. The lime-crusher comprises any suitable means for reducing the lime to about the size of nut coal. A device similar to a coal breaker is contemplated.

The water-meter, Fig. 6, consists of a vessel w provided with a graduated standard 6 and a float valve v adjustably connected with said standard and is thus rendered adjustable. The water passes from meter through pipe 7 and cock 8 to slaker L' .

The lime meter, Fig. 7, consists of a cylindrical chamber l provided with a diaphragm 9 dividing it into equal compartments. Said meter is also provided with openings a on opposite sides of the cylinder. Each chamber is also provided with a movable partition or false bottom 4 shown in dotted lines and with cleats 5-5 and set screws a^2 for supporting and securing the partition at any point desired to alter the capacity to correspond with the character of lime and sand to be used, as sand and lime vary in such way that the relative proportions of the two have to be varied to produce a given quality of mortar. The proportions also have to be varied in order to provide mortar of different qualities from

given materials. Lime is discharged from bin or hopper to fill one compartment of the meter, which is then partially rotated by crank 23 so as to discharge its contents over chute *b* to slaker *L'*, after which it is set in the position shown in Fig. 7 to receive another charge of lime.

The lime-slaker, Figs. 7 and 8, consists of a closed upright cylindrical tub or tank *L'* provided with an annular channel or depression *d* and with a main port and screen or separator *h* in the bottom of the tank and with a second port and screen *i* in the channel, both ports discharging into chute *K* leading to mixer *M*. There is also a gate or cut-off *m* in the channel discharging to spout *n* which leads to waste.

Within the slaking tank are stirring blades or agitators *o* adapted to be rotated, as shown. In operation, the blades agitate and mix the lime and water and as the lime becomes slaked, the lime paste passes through the screens to the mixer. The hard lumps of lime, stone and other refuse which will not pass the screens, accumulate in the channel and are periodically discharged through the gate *m*. Beneath the screen-covered ports is a single perforated sliding gate 27 for simultaneously opening and closing said ports. The gate is operated by rack and pinion through lever 28 carrying a pawl for rotating the pinion shaft by means of a ratchet pinion, as shown in Figs. 1 and 7. The closed slaker has an inlet port to which a charging chute *b* leads, the chute or port being closed, during the process of slaking, by a suitable gate. I have shown, Fig. 7, the lime meter so made and arranged that it registers with the mouth of the chute and after said meter has discharged its contents to slaker it is moved far enough to close the passage between meter and slaker.

The mixer consists of a tank *M* having its bottom curved in the arc of a circle and provided with an interior swinging gate or cut-off *G* for closing and opening the port *X* of the tank to discharge the contents to conveyer trough *I* whence the completed mortar is discharged to air-tight mortar vats *K'*. The gate *G* is mounted on a pivot, as shown, and is conveniently operated from the third floor through lever *N*, link *r* and arm *u*. As shown in Fig. 4, the discharge port *x* extends only part of the length of the tank, it being understood that the blades 14 will operate as a conveyer to force the contents toward the port. Obviously, the gate may extend the entire length of the tank, if desired. The blades are rotated so as to force the contents toward the port at one side of the bottom of the tank.

The sand-meter, Fig. 10, consists of a cylindrical horizontal vessel *s* having two equal compartments 10—10 and having a mouth leading to and from each of these compartments. Sand from bin *S* fills one chamber of the meter and upon turning the vessel about

one-half a revolution, the sand is discharged from one chamber and the other is brought to position and filled. A chute or trough *T* leads from sand meter to screen *A*, which discharges the screened sand to chute *B* and thence to mixer *M*. At the mouth of trough *T* is a feed-regulator *V* consisting of a rotating shaft having outwardly projecting blades for regulating the flow of sand from the meter to the screen, and forcibly discharging and scattering the sand on the screen, in a manner somewhat similar to that practiced by hand. The screen consists of a succession of sifters arranged and supported in any suitable way, as by brackets.

The hair-picker *H*, Fig. 5, consists of a rotary cylinder armed with teeth, a toothed concave and a hopper. This picker is arranged above the mixer and is designed to discharge directly into said mixer. A proper quantity of hair or fiber for a charge of lime and sand is put into the hopper where its bunches are broken up and the fiber separated, and introduced to the mixer in proper condition to be incorporated with the mortar. The vats *K'* are made air-tight, so that the finished mortar may be kept for an indefinite period without deterioration, which takes place in the open air when the hydrate or lime paste absorbs carbonic acid and becomes carbonate of lime.

I have shown many of the parts in duplicate to provide a continuous apparatus, but it is evident that a single set will operate on the same principle as the duplex arrangement shown. I have also shown shafting and gearing for driving all of the movable parts, except gates and cocks and the lime meter, from a prime motor, thus making the apparatus essentially automatic in operation.

11 is the main driving pulley operated by a suitable prime motor. This pulley drives shaft 12, from which is driven crusher *X*, and through short shaft 13 drives mixer blades 14, and said short shaft 13, through sprocket 15 drives the conveyer *C*. Shaft 12 also drives counter shaft 16. Shaft 16, through gearing shown drives the sand meter *s*, slaker and agitator shaft 17, and through cross belt 18 drives feed regulator *V*. It also drives shaft 19. Shaft 19 drives the lime and sand elevators, and through belt 20 drives crank shaft 21, the cranks of which shake the screens, and through cross belt 22 drives the hair picker.

The lime meter is operated by hand through crank 23 and the water-meter is filled by opening cock 24, and when filled the water is shut off by the same. The sand meter is operated through a mangle gear 25 through which it is rotated about one-half a revolution when it comes to rest for discharging from one compartment and filling the other. When a second charge is required the operator through lever 26 and its connected pawl moves the meter so that the gears intermesh and the operation is repeated.

In operation, the driving pulley being in motion and sand, lime, water and hair being supplied, the lime is first reduced by the crusher X and thence delivered to elevator 5 boot, and lime and sand are simultaneously elevated to the bins or hoppers. The operator now shuts off the water by means of cock 24 and then by crank 23 and cock 8 introduces, in proper pre-determined proportions, 10 a charge of lime and water to the slaker L' where they are agitated and the lime slaked, the lime meter being moved to serve as a gate to close the port leading to slaker. The operator then opens slide gate 27 and the lime 15 paste is discharged through screens h and i to mixer M. About the same time the sand meter and the hair picker are brought into operation and lime paste, sand and hair are regularly fed to the mixer at the same time. 20 When a charge from one set of machinery has been completed and the mortar fully mixed, an operator through lever N and its connections, opens gate G when the mortar passes to conveyer C and thence to vats K 25 and while this is in progress the second set of instrumentalities are switched into service and the operation is alternately repeated as long as the apparatus is in operation.

I claim as my invention—

30 1. In a mortar making apparatus, the combination of a lime-slaker and a rotating lime-meter, the latter provided with compartments, each compartment having a false-bottom adapted to be adjusted, or removed, the meter 35 arranged above the slaker so as to discharge therein, by gravity, substantially as described.

2. In a mortar making apparatus, the combination of a mortar mixer, a lime slaker, a 40 rotary lime meter provided with compartments having adjustable partitions, a water meter provided with a graduated scale and automatic cut-off, and a sand-meter, as described; the slaker and sand meter being arranged to discharge into the mixer, by gravity, 45 substantially as set forth.

3. In a mortar making apparatus, the combination of a mortar-mixer and a sand-meter, said meter having compartments, each provided with inlet and discharge openings, as 50 described, with the mangle-gear, lever, and pawl, whereby the meter is adapted for operation, substantially as described.

4. In mortar making apparatus the combination of a lime slaking tub or tank, having 55 an annular depression or channel, a port leading from the channel through which lumps and waste may be discharged, and a gate for opening and closing said port, substantially 60 as described.

5. In mortar making apparatus a lime slak-

ing tub or tank having an annular depression or channel, a port leading from the channel, and a large port in the bottom of the tub in combination with a screen to cover the large 65 port and a gate for closing and opening the channel port, substantially as described.

6. In mortar making apparatus the combination of a lime slaking tub or tank having an annular depression or channel, a screen 70 and a gate in the channel, substantially as described.

7. In mortar making apparatus the combination of a lime slaking tub having an annular depression, a main port and screen in the 75 bottom, a port and screen in the channel for discharging the contents to mixer below, and a port and gate in the channel for discharging refuse, substantially as described.

8. In mortar making apparatus the combination of a lime slaking tub having two ports 80 and screens for discharging the lime paste, a perforated sliding gate for simultaneously opening and closing said ports and means for operating said sliding gate, substantially as 85 described.

9. In mortar making apparatus the combination of a lime slaking tub, a chute and port leading into said tub and a gate or cut off for opening the port to discharge lime into the 90 slaker and to close the same after the slaker has been charged, substantially as described.

10. In mortar making apparatus the combination of a lime slaker, a chute and port leading into the same and a cylindrical lime meter 95 registering with the mouth of the chute or port for discharging lime to the slaker and for closing the port, substantially as described.

11. The combination in a mortar-making 100 apparatus, of a lime-crusher, a lime-meter having compartments provided with false-bottoms adapted to be adjusted or removed, as desired, a lime-slaker, a water-meter having a graduated standard and a float-valve 105 adjustably connected therewith, the said meters arranged to discharge into the slaker, by gravity, the bottom of the slaker provided with ports and screens, a mixing-tank arranged below the slaker, a sand-meter provided with mangle-gear and operating lever 110 and pawl, a feed regulator, and screens arranged between the said meter and mixer, the mixer provided with a discharge port and an interior swinging-gate for opening and 115 closing said port, substantially as described.

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

THOMAS D. McCLARY.

Witnesses:

H. S. WETMORE,

WM. W. PALMER.