W. J. McCRACKEN.

TILE MAKING MACHINE.

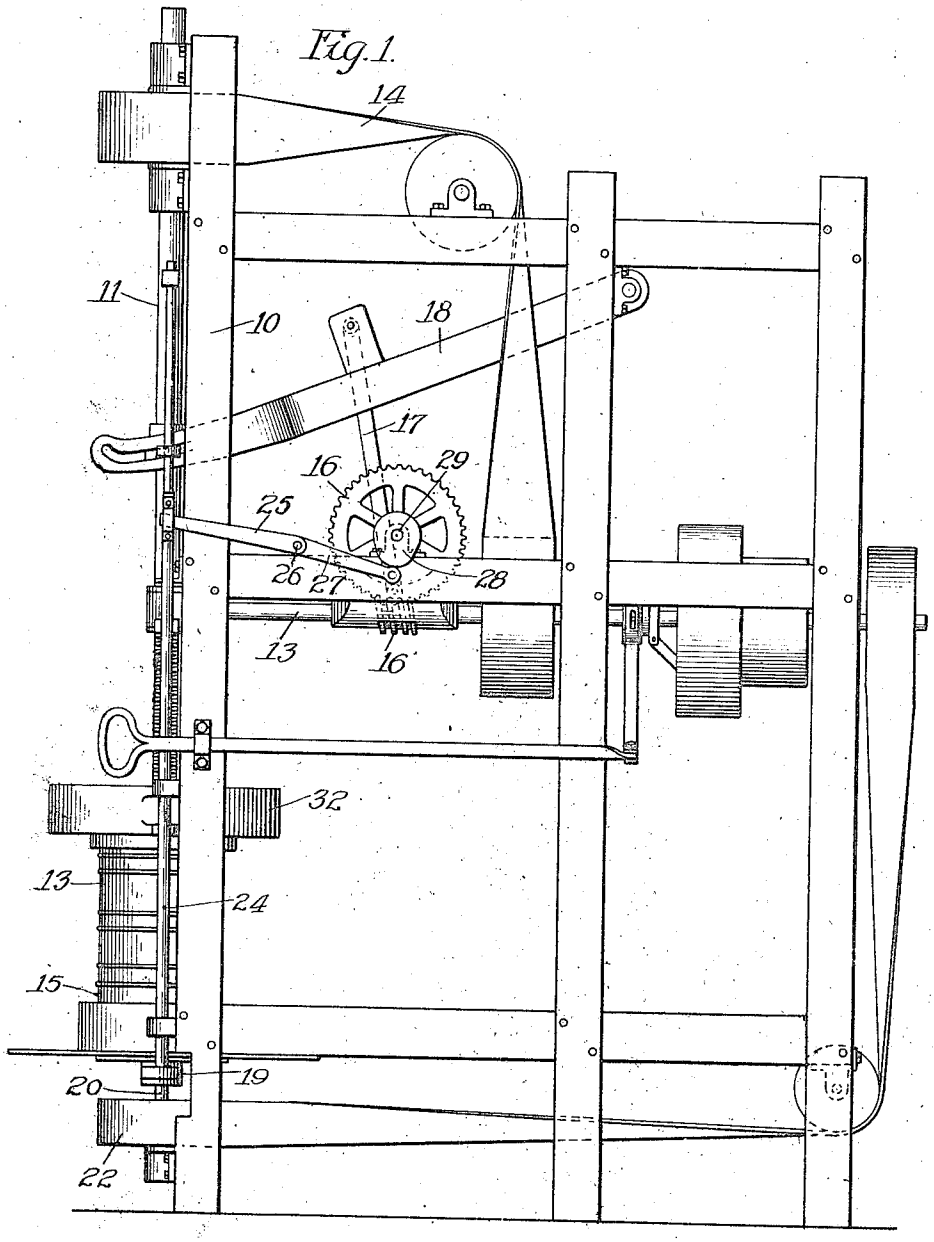
APPLICATION FILED MAY 13, 1914.

1,159,515.

Patented Nov. 9, 1915.

3 SHEETS—SHEET 1.

Fig. 1.



Witnesses.

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3 SHEETS—SHEET 2.

Fig. 2.

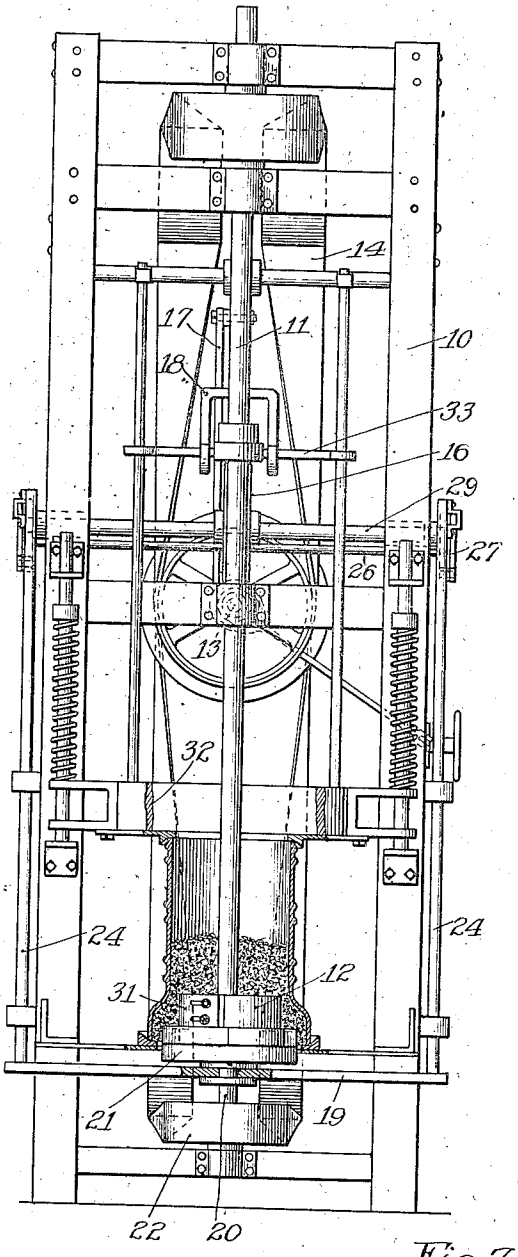


Fig. 3.

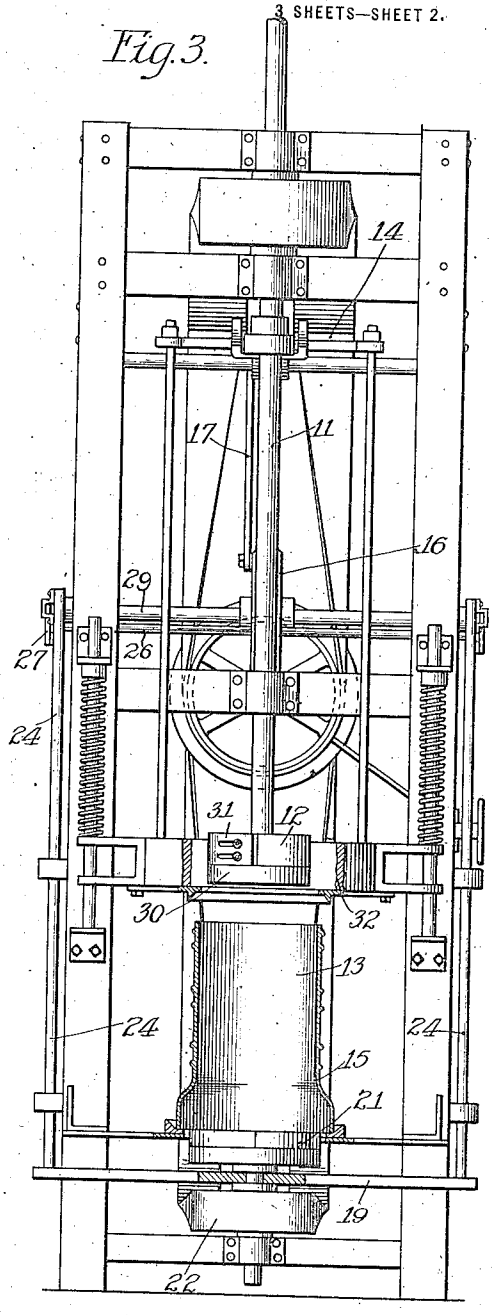
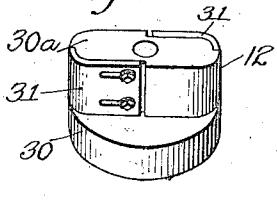


Fig. 7.



Witnesses.

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3 SHEETS—SHEET 3.

Fig. 4.

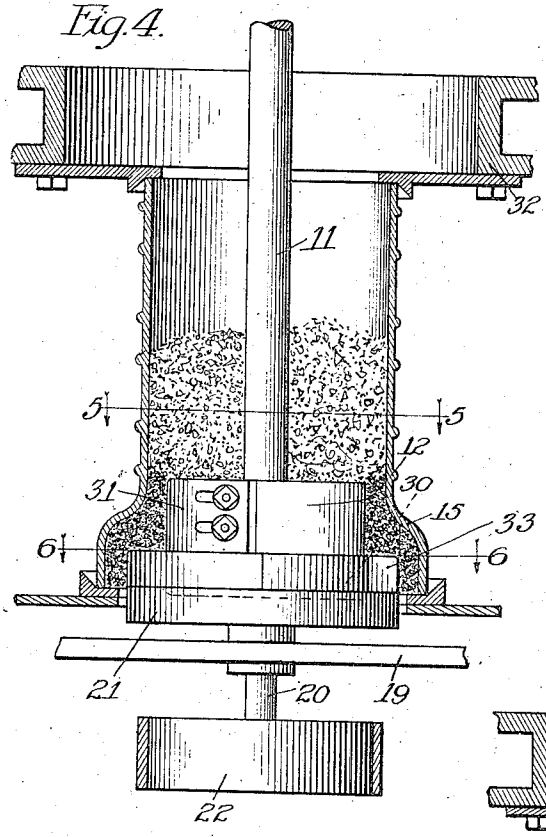


Fig. 5.

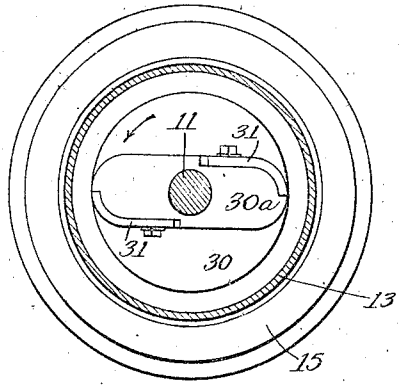


Fig. 8.

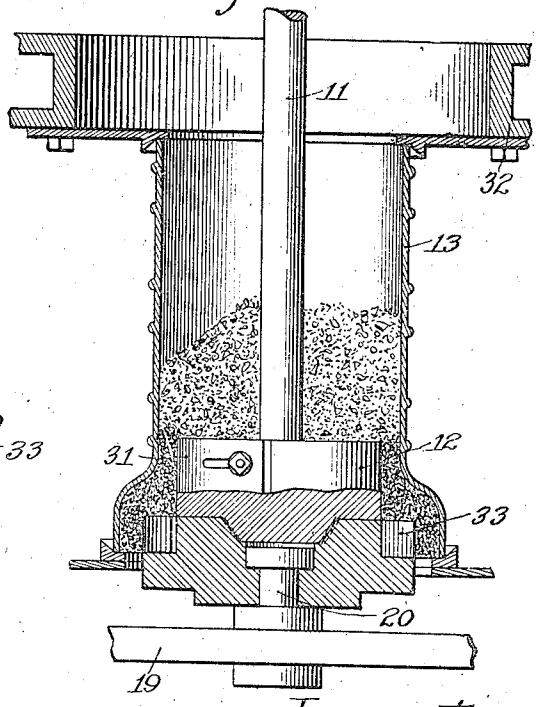
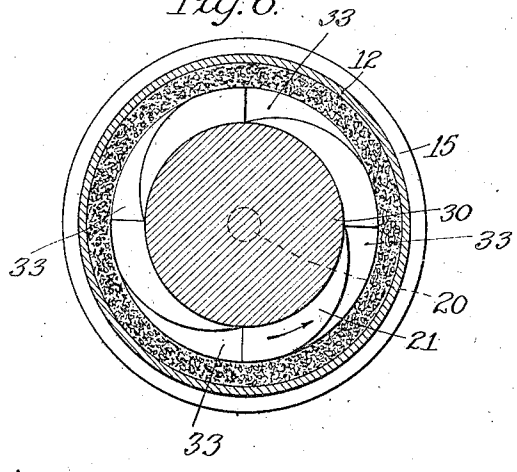


Fig. 6.



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UNITED STATES PATENT OFFICE.

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TILE-MAKING MACHINE.

1,159,515. Specification of Letters Patent. Patented Nov. 9, 1915.

Application filed May 13, 1914. Serial No. 838,263.

To all whom it may concern:

Be it known that I, WILLIAM J. McCRACKEN, a citizen of the United States, residing at Sioux City, in the county of Woodbury and State of Iowa, have invented certain new and useful Improvements in Tile-Making Machines, of which the following is a specification.

This invention relates particularly to machines for forming sewer tiles or tile sections provided with a "bell end" and it is the object of my invention to provide a machine and a former therefor so designed as to efficiently mold, pack and smooth the "bell end" of a tile.

It is a further object of my invention to provide a device of this class with a rotatable former adapted to form an annular shoulder in one end of a tile section and a separate former for forming the body portion of the tile section.

It is a further object of my invention to provide a former or packer head for a device of this class with adjustable wearing plates or wings.

The above and other features of novelty, advantages and capabilities will become apparent from a detailed description of the accompanying drawings in which I have illustrated one practical embodiment of the invention, but the construction shown therein is to be considered as illustrative only and not as defining the limits of the invention.

Referring to the drawings: Figure 1 is a side elevation of a tile making machine embodying one form of my invention. Fig. 2 is a front view of the machine shown in Fig. 1 illustrating the position of the upper and lower formers while forming the first portion of the tile. Fig. 3 is a similar view illustrating the position of the upper and lower formers after the complete tile has been formed. Fig. 4 is an enlarged cross sectional view of the mold showing the upper and lower formers in a position corresponding to that shown in Fig. 2. Fig. 5 is a cross sectional view taken on the line 5—5 of Fig. 4, looking in the direction indicated by the arrows, showing a plan of the upper former. Fig. 6 is a sectional view taken on the line 6—6 of Fig. 4 looking in the direction indicated by the arrows and shows a plan of the lower former. Fig. 7 is a perspective view of the upper former and Fig. 8 shows a modified form of the upper and lower formers in position in the mold.

Save for the construction and the provision of the upper and lower formers and the connection for driving the latter, the machine shown in the drawings is substantially the same as the machine illustrated and described in my pending application, Serial No. 579,812, filed August 21, 1910.

Referring to the drawings in detail. The machine comprises a frame work 10 in which is rotatably mounted a former shaft 11 carrying an upper former 12 which shaft is driven by the power shaft 13 by means of a suitable connection such as the belt 14. From this it will be seen that the former shaft 11 carrying the upper former is rotated whenever the power is operatively connected with the power shaft 13. While this power shaft is rotated, power is also transmitted to means for reciprocating the shaft 11 so as to move the upper former into and out of the mold 15, which means comprises a worm rigidly secured to the power shaft 13 and meshing with a worm gear 16 to which gear is pivotally connected a link 17, said link being at its opposite end pivotally connected with the walking beam 18 through a suitable bracket connection as shown. It will thus be seen that while the gear 16 is making a complete revolution, the walking beam moves up and down making a complete cycle for moving the upper former 12 downwardly substantially to the bottom of the mold 15 where it is retained for a short period, (by means of the curved slot connection in the walking beam) then again out of the mold to a position shown in Fig. 3.

The machine thus far described, is all clearly set forth in the application above referred to, while the machine there shown, as I have found from practical experience, is admirably adapted for forming straight tile sections. It is not adapted for forming sewer tiles *i. e.* tiles having a "bell end". I have therefore in my present invention brought forth improvements for accomplishing this purpose which I will now describe.

Rotatably mounted in the support 19, is a short shaft 20 which is held against vertical displacement with respect thereto by means of a pair of collars rigidly secured to said shaft on each side of the support 19. Fixed to the upper end of the shaft 20, is the lower former 21 and at the opposite end, a pulley 22, both of which are adapted to rotate therewith. It will thus be seen that by rotating the pulley 22 (which may be accom-

plished by any suitable means, such for instance, as the belt 23 connecting with the power shaft 13 as shown) the former 21 is caused to rotate, thus firmly packing the "bell end" of the tile and smoothing the interior surface thereof. For raising the former 21 from the position shown in Fig. 3 to that shown in Fig. 2, I have provided a pair of rods 24 slidably mounted in suitable brackets at each side of the machine which are connected at their lower ends to the support 19 and near their upper ends, by any suitable means, to the arms 25 which arms are at their opposite ends rigidly fixed to a shaft 26. This shaft has rigidly secured thereto a third arm 27 which arm carries at its free end a suitable roller adapted to be engaged by the cam 28, which cam is fast to the shaft 29 on which the worm gear 16 is mounted. It will thus be seen that when the worm gear 16 is caused to rotate through its connection with the power shaft 13, the cam 28 engages the arm 27 and partially rotates the shaft 26 which in turn causes the free end of the arms 25 to move upwardly, raising with them the support 19 and necessarily the former 21 through the connection of the rods 24. The raising of the lower former is, of course, timed so that it is in its uppermost position when the upper former is in its lowermost position.

The lower former is somewhat larger in diameter than the upper one and is dished concentrically of its center to receive the lower portion 30 of the upper former as shown in dotted lines Fig. 4. The periphery or surface of the lower former is recessed as best shown in Fig. 6 by means of which the material is firmly packed and troweled. The portion 30^a of the upper former which actually does the packing and forming, is of an oblong shape and is provided at its opposite corners with adjustable plate 31 as best shown in Fig. 5.

While thus far I have described the lower former as driven from the power shaft 13 through the connection 23, it may also be driven by means of the former shaft 11. To accomplish this, it requires a modification of the construction of the upper and lower former which I have shown in Fig. 8. Referring to this figure, it will be seen that the upper former 12 has at its underside a downwardly extending cone shaped portion 13 adapted to fit into an inverted corresponding shaped recess in the lower former 21. If necessary, the surface of the cone shaped portion 13 and the surface of the inverted corresponding recess in the lower former may be corrugated, as indicated in dotted lines in Fig. 8 to insure the turning of one with the other when in contact. However, I do not think this will be necessary as the formers can be forced together with a sufficiently tight fit through the means heretofore described to insure this result. In case the modification shown in Fig. 8 is used, there will, of course, be no occasion for the pulley 22, however, the shaft 20 would in that case be arranged on the support 19 in the same manner as heretofore described.

By means of the curved slot in the walking beam 18, which connects with the upper former shaft through suitable pins 33, the continued movement of the gear 16 does not cause any vertical movement of the upper former shaft 11 so that the upper former rotates for a sufficient time in the bottom to allow the lower former to properly pack the "bell end" of the tile before it (upper former) starts on its upward travel.

In practical operation and assuming that my present invention is applied to the machine illustrated in the drawings and that the parts are in the position shown in Figs. 1 and 2, the power is turned on which causes both the upper and lower formers to rotate within the mold, the material for forming the tile is then poured into the mold 13 through a hopper 32 where it drops down past the upper former 12 and into the recesses 33 in the lower former which former rotates in the direction indicated by the arrows whereby this material is forced outwardly and firmly packed against the mold leaving a perfectly smooth surface on the interior. The raising and lowering of these formers is so timed that the lower one is returned to its normal position (shown in Fig. 3) after the material at the lower end of the mold has been properly packed, while the upper former is gradually raised through the walking beam connection and firmly packs and forms the remainder of the tile section in its upward travel.

My invention is capable of other modifications than the forms illustrated in the drawings and hereinbefore specifically described but I do not wish to be understood as limiting myself to the specific forms shown, except in those claims where these features are specified.

I claim:

1. In a tile making machine, the combination of upper and lower rotary formers adapted to operate in a suitable mold, means for moving said formers together and means for moving said formers in opposite directions.

2. In a tile making machine, the combination of an upper and lower former adapted to operate in a suitable mold, means for moving said formers together near one end of the mold form forming the "bell end" of a tile section and means for gradually moving the upper former away from the lower former for completing the tile section.

3. In a tile making machine, the combina-

tion of a rotary former adapted to operate in a suitable mold for forming an annular shoulder on one end of a tile section, means for moving said former into and out of said mold, said means comprising a support for said former, a pair of links connecting said support with a pair of arms fixed to a shaft and means for partially rotating said shaft.

4. In a tile making machine, the combination of a suitable mold provided with a "bell end", a rotary former adapted to operate in the "bell end" of said mold and means for moving said former into and out of the bell end of said mold, said means comprising a support for said former, a pair of links connecting said support with a pair of arms fixed to a shaft and means for partially rotating said shaft for the purpose set forth.

5. In a tile making machine, the combination of a rotatable former adapted to move into the bell end of a suitable mold for forming the "bell end" of a tile section, means for rotating the former and means for raising and lowering the former without interrupting the rotation thereof.

6. In a tile making machine, the combination of a rotary former for making the bell end of the tile with a former for making the body of the tile, said body former being adapted to partially telescope with said bell former, means for bringing said formers into telescoping relation to form the bell end of the tile and a portion of the body adjacent thereto, including means for thereafter moving said body former away from said bell former for completing the body of the tile.

7. In a tile making machine, a bell former comprising packing elements, a body former comprising a packing wing and a disk portion adapted to carry up surplus material and interiorly polish the body of the tile, means for bringing said formers together for forming the bell of the tile and a portion adjacent thereto, including means for causing said disk portion to telescope into said bell former whereby during the formation of the bell of the tile said bell former and packing wing will be adjacent, and for thereafter withdrawing said body former from the bell former to complete the tile.

8. In a tile making machine the combination of a rotary former for making the bell end of a tile, with another rotary former for making the body thereof and means for moving said formers together to form the bell end and a portion adjacent thereto and for thereafter moving them apart to complete the tile.

In witness whereof, I hereunto subscribe my name to this specification in the presence of two witnesses.

W. J. McCRACKEN.

Witnesses:
LOUISE REED,
E. A. BURGESS.