

July 28, 1931.

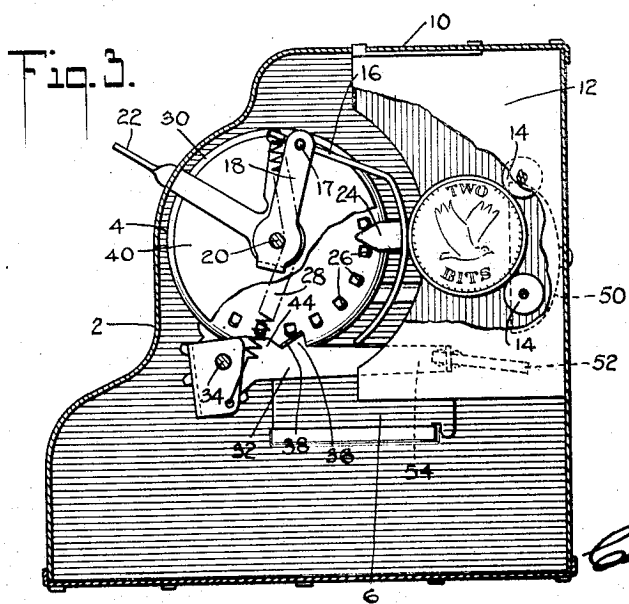
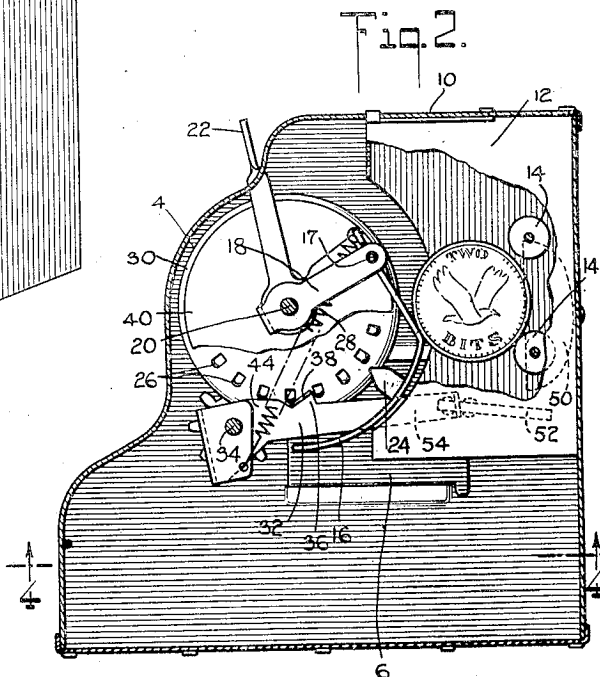
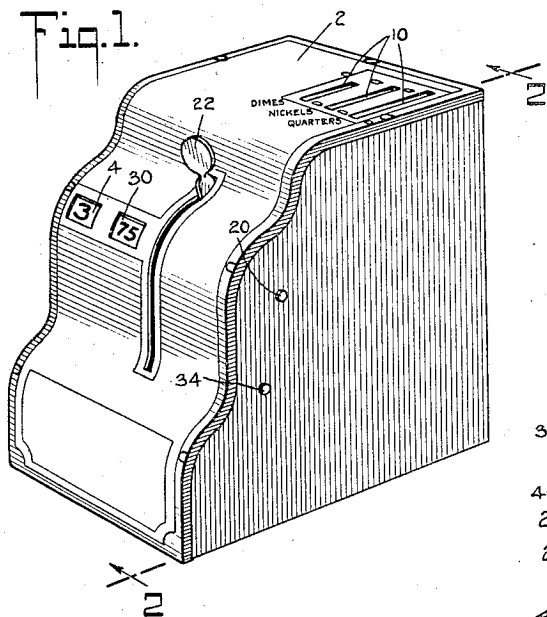
A. N. SMITH

1,816,347

REGISTERING BANK

Filed March 5, 1929

2 Sheets-Sheet 1



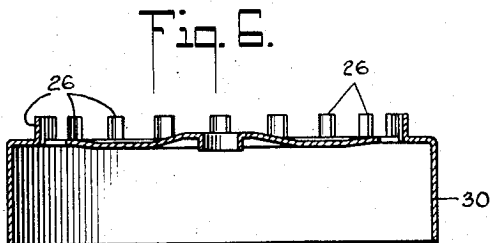
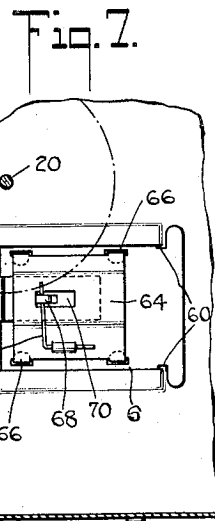
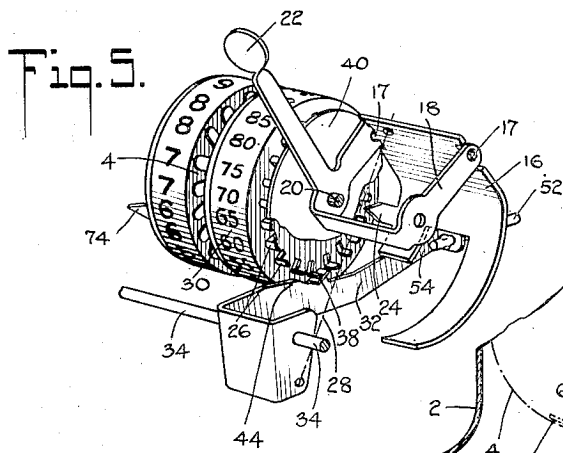
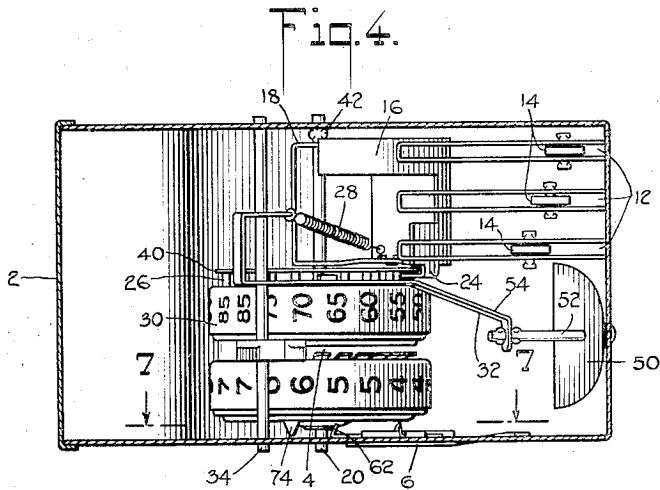
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1,816,347
2 Sheets-Sheet 2



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REGISTERING BANK

Application filed March 5, 1929. Serial No. 344,291.

This invention relates to registering mechanisms and more particularly to coin registering savings banks.

The primary object of the present invention is to improve coin registering savings banks, such as have been disclosed in the copending application of Stanley L. Connell, Serial No. 265,889, filed March 30, 1928.

In registering mechanisms the construction is sometimes sought to be simplified by forming a toothed wheel, intended to rotate with a registering wheel, integrally therewith by the simple expedient of striking the teeth out from the side of the registering wheel. Such an arrangement results in teeth which are weak, and which do not present a smooth rounded tooth face. One object of my invention is to improve such a structure by providing teeth which are stronger, more rigid, larger, and which present a smoother tooth face, without meanwhile increasing the difficulty of manufacturing the wheel.

Further objects of the present invention are to apply such a wheel as the ratchet wheel of a registering mechanism such as is described in the copending application already referred to, and by its use, together with an improved pawl mechanism, to make the indications of the registering wheels more accurately centered or indexed.

A ratchet wheel such as has already been described is open-faced, that is, because the teeth are struck out from one side of a disk the remote ends of the teeth are open-ended. There consequently is a tendency for the pawl which cooperates with such a ratchet wheel to slide off the ends of the teeth, a tendency the counteraction of which is still another object of my invention.

The registering bank already mentioned is equipped with a bell and bell clapper system which is rung upon depression of the operating arm or key of the bank. This arrangement is faulty in that it permits the bell to be rung even though no coin has been deposited in the bank, and accordingly, a further object of my invention is the provision of a bell ringing mechanism which is operative only when a coin is actually being

registered. Another object of the present invention is to cause the bell to ring a number of times which is commensurate with the denomination of the coin being registered by the bank. A still further object of the present invention is to provide a bell ringing system which is so advantageously combined with other mechanism which is anyway needed as part of the registering mechanism that no appreciable complication is introduced by the addition thereto of the bell ringing mechanism.

In order to encourage savings the depositor should, if possible, be given a goal toward which his savings are directed. Accordingly, another object of my invention is to provide the door of a coin registering savings bank with a lock which is automatically opened only after a predetermined total has been deposited in the bank. At the same time, inasmuch as it is not desirable to have to break open the bank if, for some reason, the deposited savings must be withdrawn before they attain the predetermined total, I provide a manually operable key for releasing the lock which ordinarily is automatically released by the registering mechanism. This key may be kept in the custody of someone other than, and in supervisory relation to, the depositor.

To the accomplishment of the foregoing and such other objects as will hereinafter appear, my invention consists in the elements and their relation one to the other, as hereinafter are more particularly described and sought to be defined in the claims; reference being had to the accompanying drawings which show a preferred embodiment of my invention, and in which:

Fig. 1 is a perspective view of the registering savings bank of the invention;

Fig. 2 is a section taken in the plane of the line 2—2 in Fig. 1 and shows the relation of the parts just after deposit and before registration of a coin;

Fig. 3 is a similar section showing the relation of the parts during the registration of a coin;

Fig. 4 is a horizontal section taken in the

plane of the line 4—4 in Fig. 2, looking in the direction of the arrows;

Fig. 5 is a perspective view of the major elements of the registering mechanism;

5 Fig. 6 is a detail section through one-half of a combined registering wheel and ratchet wheel constructed in accordance with my invention; and

10 Fig. 7 is a view taken on the line 7—7 in Fig. 4, showing the door and lock mechanism.

Referring to the drawings, the coin registering savings bank comprises generally a casing 2, coin registering mechanism 4, and

15 a door and lock mechanism 6. The casing 2 is substantially similar to that described in the copending application already mentioned, and may be briefly described as generally simulating a cash register. It is composed of sheet metal sides

20 which are fitted together with tongue and slot joints, and is provided with coin slots 10, of proper dimension, sight windows for the registering wheels, and other features, which will be described as the need arises. A coin of appropriate denomination is

25 dropped into one of the slots 10 in the casing, and thence falls into the corresponding one of the chutes 12 where, by its presence, during downward depression of the operating arm or key 22, it causes the registering mechanism to add to the total registration indexed by the wheels an amount commensurate with the denomination of the coin. Upon completion of the downward oscillation of the key the coin drops out of the

30 chute into the bottom of the casing, where it remains and is saved with the other deposited coins until the door 6 is opened, when the savings may be removed.

35 Considering the mechanism more closely, each of the coin chutes 12 contains bearing rollers 14, which are so spaced from the forward edge of the chute that a coin of

40 appropriate denomination, dropped into the chute, comes to rest against the rollers and a flat cam member 16. The cam member 16 is pivoted on trunnions 17 in an oscillatable

45 yoke 18, which is oscillated about the main shaft 20 of the registering mechanism by means of an operating key or arm 22, as is

50 best shown in Figs. 2, 3 and 5. The cam 16 carries an operating pawl 24, integrally formed therewith, which normally is kept

55 out of engagement with the ratchet teeth 26, as is shown in Fig. 2, by reason of the tension of a spring 28. However, when the operating arm 22 is pressed downwardly,

60 rotating the yoke 18 with it, the cam 16 is moved radially toward the shaft 20 about the trunnions 17 as it rides along the edge of the coin supported against the rollers 14

65 in the chute 12, and this inward movement brings the operating pawl 24 into engage-

ment with the ratchet teeth 26 and so causes the ratchet wheel to move with the yoke and cam in order to obtain the desired registration. Thus Fig. 2 shows the relation of the cam 16, the operating pawl 24, and the ratchet teeth 26, when a coin is first dropped in the chute, the coin coming to rest between the wheels 14 and the cam surface 16. Fig. 3 shows the condition which obtains when the arm 22 is being depressed, and it will be observed that the pressure of the cam surface 16 against the edge of the coin has moved the operating pawl 24 radially inwards between two adjacent teeth of the ratchet wheel, so that the continued oscillation of the operating arm 22 causes the combined ratchet wheel and registering wheel 30 to rotate. The amount of rotation is made commensurate with the denomination of the particular coin then being registered by varying the effective operating length of the cam 16, as may best be observed in Figs. 4 and 5, where it will be seen that the operating length of the cam, at the dime chute, is twice as long as it is at the nickel chute, while at the quarter chute it is five times as long as it is at the nickel chute. The number of the ratchet teeth 26 is made equal to or is related by a small whole number to the number of indications on the registering wheel, and the effective operating lengths of the different portions of the cam 16 are properly related to the spacing of the ratchet teeth to obtain the desired movement. The registering wheel is kept at proper index by a holding pawl 32.

For economy in manufacture the registering wheel 30 is made up of two sheet metal halves which fit together to form a drum-like cylinder, and the teeth 26 are stamped out from the disk or side of one of these halves. With such a construction, which, it may be remarked, is applicable to registering mechanisms in general, it is difficult to obtain teeth of sufficient strength and rigidity, and according to one important feature of my invention these teeth are so formed that, while extending normally of the disk, they are arcuate in configuration or cross section, as is best indicated by the teeth 26 in Fig. 6 of the drawing, representing a section thru one-half of the wheel 30. This feature strengthens the teeth, augments their rigidity, and also results in a smoother tooth face or working face against which other mechanism, for example an operating or a holding pawl, may bear. Furthermore, in accordance with my invention these teeth are stamped out as near to the periphery of the wheel as is conveniently possible, thereby permitting them to be made as large as possible, which further serves to strengthen them. In the particular mechanism here disclosed the latter feature permits the operating and holding

pawls to be so shortened that there is no difficulty in making them sufficiently rigid for accurate response. This accuracy of indication or index of the registering wheels is further promoted by increasing the size of the pawls, giving them a broad and rather blunt triangular shape, so that they completely fill up the space between the teeth 26 of the wheel 30, and thereby make the resulting movements and indications of the wheel 30 quite exact.

The registering wheel 30 is held in position, after the operating pawl 24 has been retracted from the ratchet teeth 26 by the spring 28 when the cam 16 has passed and released the coin last registered, by a holding pawl 32, best shown in Figs. 2, 3, and 5. This pawl is pivoted on a spindle 34, which, like the main shaft 20, is journaled in the sides of the case 2 of the savings bank. In accordance with one feature of my invention the holding pawl 32 has a wide short triangular tooth 36, the leading side of which has less slope than the following side in order to permit the ratchet teeth to move past the pawl without too much difficulty, and for another reason described later. The pawl is made of sheet metal, and in order to take the wear, the leading side of the tooth 36 is given a large bearing surface by bending a flange of the sheet metal over, as at 38, a feature which is perhaps best shown in Fig. 5 of the drawings. By reference to Fig. 2 it will be noticed that the tooth 36 is sufficiently wide to completely fill up the space between adjacent teeth of the ratchet wheel, and so to definitely fix the index of the wheel.

The mode of interconnection of the cent registering wheel 30 with the next or dollar registering wheel in the registering train need not be described, for it is described in the copending application already referred to, and may be of any conventional type regularly employed in this type of mechanism.

The ratchet teeth, being formed by stamping them out of one side of the registering wheel 30, are open at their other extremities, so that there is a tendency for the holding pawl to move sideways and off the ends of the teeth, a tendency which is not completely overcome even though a disk 40 is provided for the purpose of closing the ends of these teeth. In accordance with my invention the pawl 32 is free to move axially along the spindle 34, and the tension spring, which is stretched between the cam 16 and the holding pawl 32 in order to obtain the desired resilient action of both of these members, is positioned at an inclination, evident from an inspection of Fig. 4, which is in the proper direction to tend to pull the pawl toward the wheel 30, and so to hold it in engagement with the ratchet teeth 26. The reac-

tion of this tension is taken by the yoke 18 against a thrust bearing 42 on the main shaft 20 of the registering mechanism. In order to prevent the holding pawl from moving past the edge of the wheel 30 the pawl is provided with a bearing portion 44, which, even when the pawl is depressed out of engagement with the ratchet teeth, still bears against the side of the ratchet wheel 30, and so prevents the pawl from moving too far in that direction.

It is desirable to obtain an audible indication of the registration of coins in the bank, and this indication should preferably not be obtained simply as a result of depressing the operating arm 22, for then it could be sounded at will even though no coin is deposited in the bank. With these objects in view I provide a bell and bell clapper system which is actuated by the movement of the holding pawl which anyway results when a coin is registered. More specifically, there is a bell 50, supported on the back side of the bank, and a bell clapper or striker 52 which is loosely held on an extension 54 of the holding pawl 32. It has already been mentioned that the following side of the holding pawl tooth 36 is relatively steep, so that, as a ratchet tooth 26 rides past the leading side 38 of the holding pawl the bell clapper 52 is raised smartly under the tension of the spring 28, and this motion is continued by inertia, owing to the loose fastening between the striker 52 and the holding pawl extension 54, until the striker hits the bell. With this arrangement the bell is not rung except when a coin is actually deposited and registered by the bank. Furthermore, the bell is rung, say, once if a nickel is deposited, twice if a dime is deposited, and five times if a quarter is deposited, that is, the bell may be rung a number of times which is commensurate with the denomination of the coin then being deposited in the bank.

It has already been mentioned that the bank is provided with a locked door or closure 6 for removing the coins deposited therein. My invention includes means actuated by the registering mechanism for releasing the lock upon depositing a predetermined total in the bank. To describe this, reference is made to an interior view of the door, shown in detail in Fig. 7, where it will be observed that the door, when opened, is able to swing outwardly about the contracted portion 60, but normally is locked in closed position by a reciprocable bolt 62 which slides between the inner surface of the door and the outer surface of an inner plate 64, attached to the door by tongue and slot joints 66. The bolt 62 carries a lug 68 which extends through a slot 70 in the inner plate 64. A spring 72 is arranged to urge the lug 68 and the bolt 62

into the locking position. The end of the bolt presents a flanged surface against which a tooth 74, struck out from the side of the last, in this case, the dollar wheel (see Fig. 5) presses when the wheel indicates a predetermined total. This slides the bolt open and unlocks the door, permitting the deposited coins to be removed from the bank.

In order that the bank may be opened before the predetermined total has been deposited I also provide a manually operable key for releasing the lock at will. A key hole 80 is cut through the side of the bank, and a key is provided which, in the case shown, is a simple form of latch key, the tang of which rides against the flanged end of the bolt 62 and slides it backward to open the door. By placing the key in the custody of someone other than the depositor, the latter is encouraged to save, with a desired total always in view, just as though there were no key, but should it become necessary to extract the savings prematurely, this may be done without wrecking the bank. Also, as a toy, the play value of the bank is very greatly augmented by the provision of both the manual and automatic locking features.

It will be apparent that while I have shown and described my invention in the preferred form, many changes and modifications may be made in the structure disclosed without departing from the spirit of the invention, defined in the following claims.

I claim:

1. In a coin registering mechanism, in combination, a registering wheel, a ratchet wheel for driving the registering wheel, a stationary coin chute for receiving and holding a coin in position, a relatively widely tapered operating pawl normally not in engagement with the teeth of said ratchet wheel, a cam-shaped coin engaging device connected to said operating pawl, and an operating key for moving said device into riding engagement over a coin in said chute, the said device being so shaped that the engagement thereof with a coin in the chute causes the pawl to engage and fill up the space between the ratchet teeth in order to move and accurately index the registering wheel.

2. A coin registering bank including a casing and coin controlled registering and alarm mechanism comprising a registering wheel, a ratchet wheel rotating with the registering wheel, alarm mechanism, a locking pawl interconnected therewith and having a wide triangular tooth for locking and properly indexing the registering wheel, a single spring urging said locking pawl radially into engagement with the ratchet teeth and actuating the alarm mechanism, said spring being mounted at an inclination in order to also urge the locking pawl toward the face of the registering wheel in order to insure

that it does not slide past the ends of the ratchet teeth, a portion of said locking pawl being so designed as to engage the periphery of the registering wheel to prevent it from moving past the face thereof.

3. A coin registering savings bank including a casing, and coin controlled registering mechanism comprising, in combination, a registering wheel, a ratchet wheel for driving the registering wheel, an operating pawl, a locking pawl for holding and properly centering the registering wheel, an alarm mechanism actuated by the locking pawl so that movement of the registering wheel by the operating pawl actuates the alarm mechanism, and a single spring arranged to operate the locking pawl to actuate the alarm mechanism and to normally urge the operating and locking pawls respectively out of and into engagement with the ratchet wheel.

4. In a coin registering mechanism, in combination, a registering wheel, a ratchet wheel for driving the registering wheel, a coin chute for receiving and holding a coin, an operating pawl normally not in engagement with the teeth of said ratchet wheel, a coin engaging device connected to said operating pawl, an operating key for moving said device into riding engagement over a coin in said chute, said device being so shaped that engagement thereby with a coin in the chute causes the pawl to engage the ratchet teeth and move the registering wheel, a locking pawl for holding and properly centering the registering wheel, and a single spring arranged to normally urge the operating and locking pawls respectively out of and into engagement with the ratchet wheel.

5. A coin registering savings bank comprising a casing, a registering mechanism in said casing, and a coin chute in said casing, said mechanism including a registering wheel, a ratchet wheel formed by teeth at the side of the registering wheel, means operable upon deposit of a coin in said chute for actuating said registering wheel, a locking pawl having a wide triangular tooth for locking and properly indexing the ratchet and registering wheel, and a spring urging said locking pawl into engagement with the ratchet teeth, said spring being mounted at an inclination for also urging the locking pawl toward the face of the registering wheel in order to insure against sliding past the ends of the ratchet teeth.

6. A coin registering savings bank comprising a casing, a registering mechanism in said casing, and a coin chute in said casing, said mechanism including a registering wheel, a ratchet wheel formed by teeth at the side of the registering wheel, means operable upon deposit of a coin in said chute for actuating said registering wheel, a locking pawl having a wide triangular tooth for

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- locking and properly indexing the ratchet and registering wheel, and a spring urging said locking pawl into engagement with the ratchet teeth, said spring being mounted at an inclination for also urging the locking pawl toward the face of the registering wheel in order to insure against sliding past the ends of the ratchet teeth, and a portion of said locking pawl being so designed as to engage the periphery of the registering wheel to prevent it from moving in the other direction past the face thereof.
7. A coin registering savings bank comprising a casing, registering mechanism in said casing, and a coin chute in said casing, said mechanism including a ratchet wheel, an operating pawl operable upon deposit of a coin in said chute for operating said ratchet wheel, a locking pawl, and a single spring arranged to normally urge the operating and locking pawls respectively out of and into engagement with the ratchet wheel.
8. A coin registering savings bank comprising a casing, registering mechanism in said casing, and a coin chute in said casing, said mechanism including a registering wheel, a ratchet wheel for driving the registering wheel formed by teeth at the side of the registering wheel, an operating pawl for operating said ratchet wheel upon deposit of a coin in said chute, a locking pawl having a wide tooth, and a single spring arranged to normally urge the operating pawl out of engagement with the ratchet wheel and the tooth of the locking pawl into engagement with the ratchet wheel in order to hold and properly index the registering wheel.
9. A coin registering mechanism comprising, in combination, a registering wheel, a ratchet wheel for driving the registering wheel, a plurality of stationary coin chutes for receiving and holding a coin in position, a U-shaped sheet metal member oscillatably mounted alongside of the registering wheel and having integrally formed therewith a projecting operating key for oscillating said U-shaped member, a cam shaped coin engaging device made out of a flat piece of sheet metal and pivotally mounted on the arms of said U-shaped member, said cam shaped member further including an operating pawl tooth bent at right angles to the cam shaped member for engaging the teeth of said ratchet wheel, and resilient means normally holding said pawl out of engagement, the said operating key serving to move the U-shaped member and with it the cam shaped coin engaging device into riding engagement with a coin in said chute, the flat surface of said device being so curved that the engagement thereof with a coin in the chute causes the pawl to engage the ratchet and move the registering wheel, and the lower or trailing edge of said device being stepped to vary the effective length of
- the coin engaging surface at each of said coin chutes so as to vary the registration commensurate to the denomination of the coin received by said chute.
- Signed at borough of Girard, in the county of Erie, and State of Pennsylvania, this 1st day of March A. D. 1929.
- ANTHONY N. SMITH.