

F. A. NIEMANN.
ADDING MACHINE DASH POT MECHANISM.
APPLICATION FILED APR. 27, 1908.

1,012,698.

Patented Dec. 26, 1911.

4 SHEETS—SHEET 1.

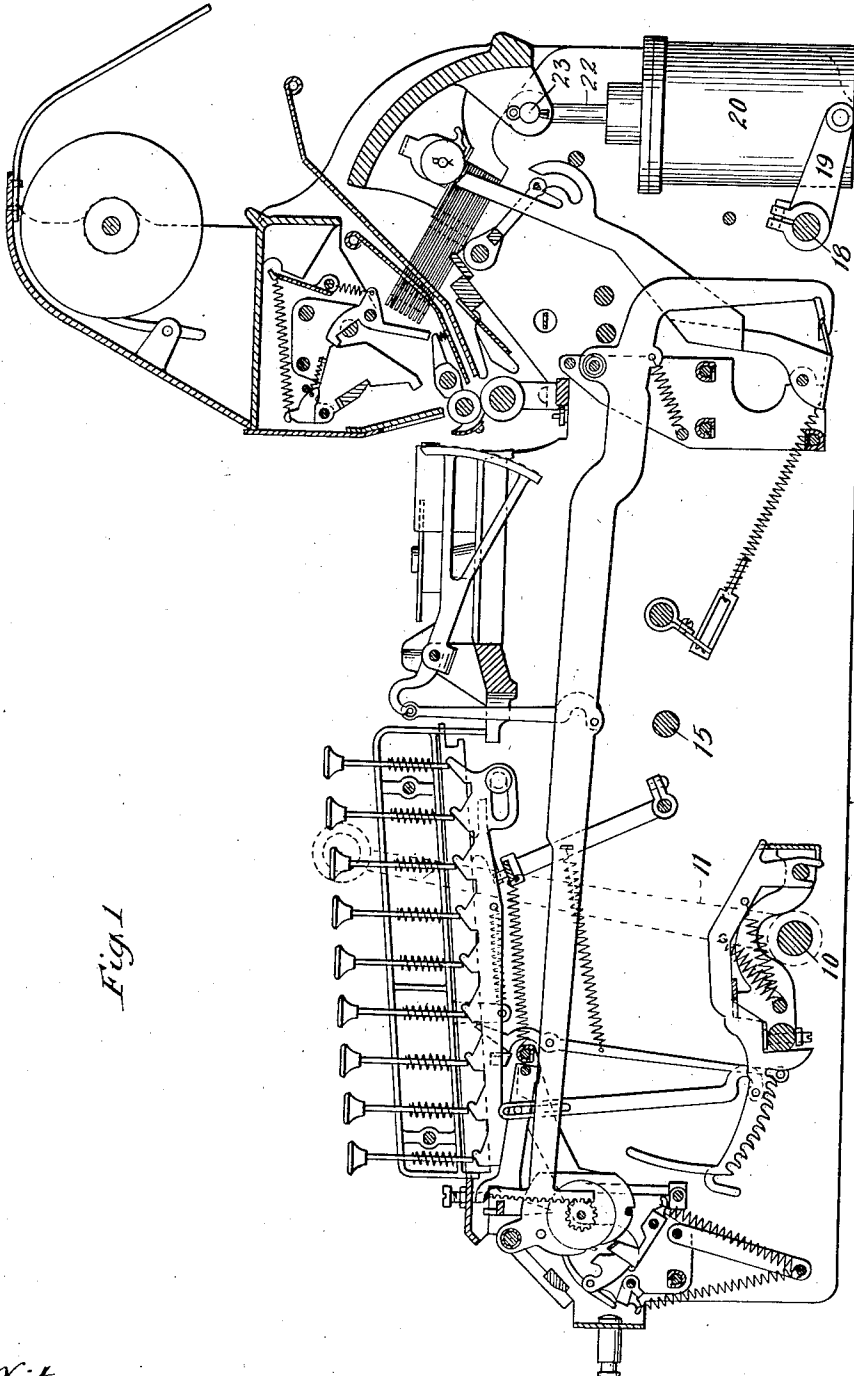


Fig. 1

Witnesses:

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A. W. Munday

Inventor:
Frederick A. Niemann

By Munday, Evans, Adcock & Clark,

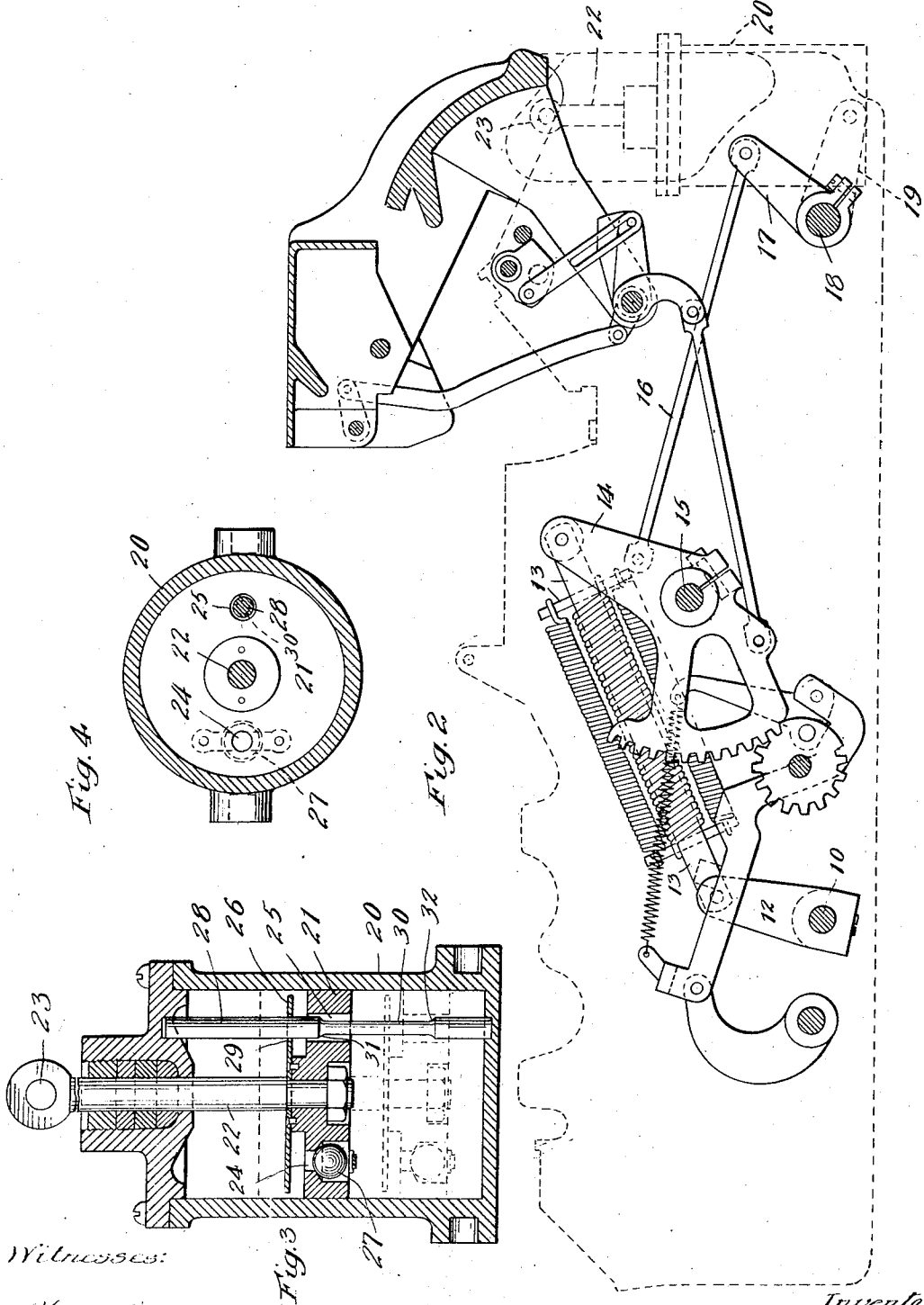
Attorneys

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Witnesses:

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Inventor:
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4 SHEETS—SHEET 3

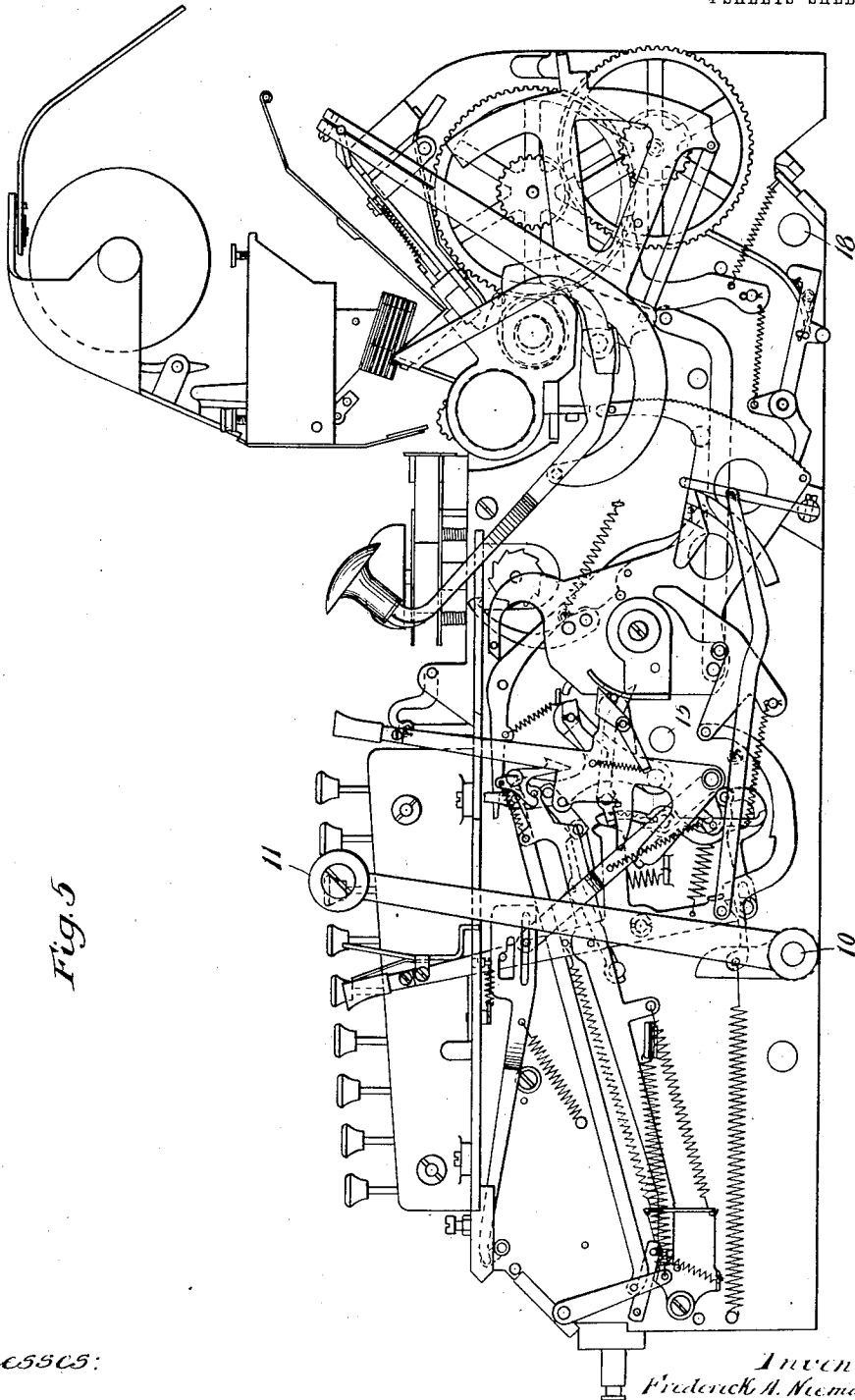


Fig. 5

Witnesses:

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4 SHEETS—SHEET 4

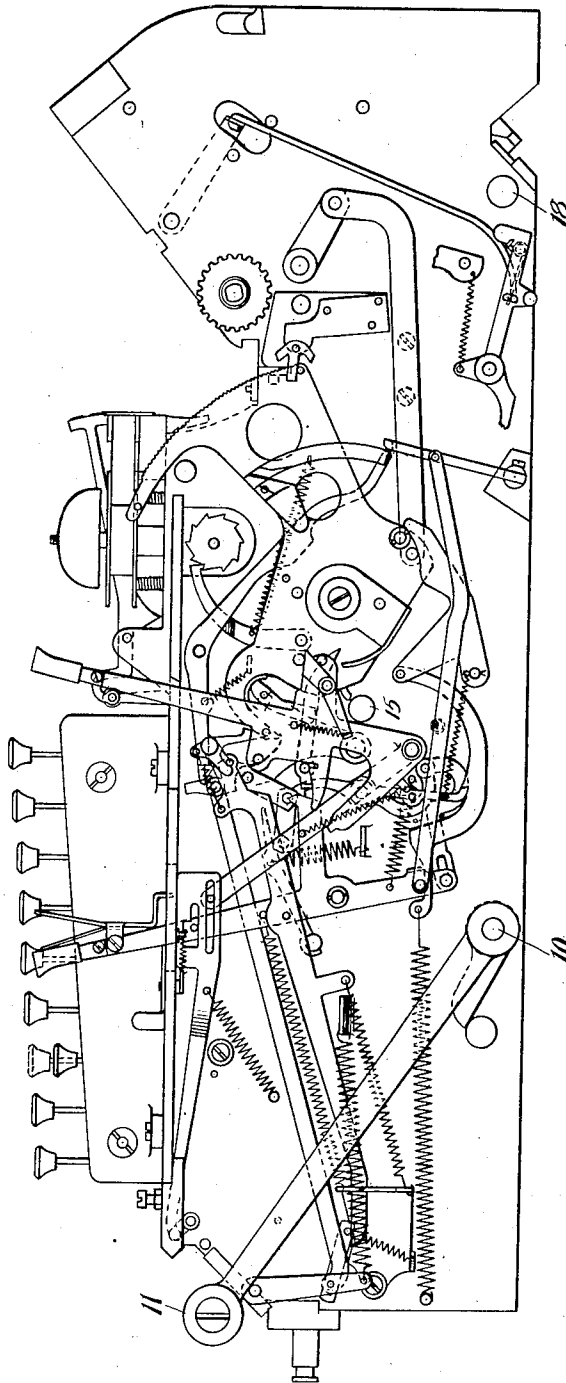


Fig. 6

Witnesses:

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UNITED STATES PATENT OFFICE.

FREDERICK A. NIEMANN, OF CHICAGO, ILLINOIS, ASSIGNOR TO COMPTOGRAPH COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

ADDING-MACHINE DASH-POT MECHANISM.

1,012,698.

Specification of Letters Patent.

Patented Dec. 26, 1911.

Application filed April 27, 1908. Serial No. 429,375.

To all whom it may concern:

Be it known that I, FREDERICK A. NIEMANN, a citizen of the United States, residing in Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Adding-Machine Dash-Pot Mechanism, of which the following is a specification.

My invention relates to improvements in adding machine mechanism, and particularly to that of printing machines, whereby the speed of movement of the actuating rock-shaft or rock-shafts of the machine will be most effectively governed and graduated to properly check and cushion the rapidly moving parts and yet reduce to a minimum the resistance opposed to the hand of the operator or to any motor drive mechanism that may be substituted for hand operation of the machine, and the invention specially relates to the dash-pot device commonly embodied in such printing adding machines to govern and limit the rapid movement of their parts.

The invention is shown as embodied in the well known "Comptograph" printing adding machine, generally shown in the U. S. patent to Felt *et al.*, No. 853543, and other prior patents to Felt; and the aforesaid dash-pot mechanism heretofore employed in such machines is shown more particularly on Sheet 5 of the drawings of said Patent 853543.

In the accompanying drawings, forming a part of this specification, Figure 1 is a vertical longitudinal-section of the entire adding machine, such as is shown in the aforesaid Patent 853543; Fig. 2 is a side elevation of the same machine, showing the dash-pot in its operative relation to the main actuating rock-arms and rock-shafts whereby movement is imparted to the adding and printing mechanisms; Fig. 3 is a vertical sectional view of the improved dash-pot; Fig. 4 is a sectional view on the line 4-4 of Fig. 3; Fig. 5 is a side elevation of the adding machine; and Fig. 6 is a partial side elevation showing the parts in different positions from those occupied in Fig. 1.

Like reference numerals indicate like parts in all the figures.

Figs. 5 and 6 are exact duplicates of Figs. 1 and 2, respectively, of the above

mentioned Patent No. 853,543, and are fully described in said patent.

10 is the main rock-shaft of the adding machine, to which is secured the operating handle 11. Said rock-shaft carries rigidly secured upon it the rock-arm 12, which is linked by the telescopic triple-spring connection 13 to the rock-arm 14 secured upon the secondary rock-shaft 15, all of the operating movement being transmitted to the adding and printing mechanism from said secondary rock-arm and rock-shaft, such operation of the adding-and-printing mechanism, in the manner set forth in the above mentioned Letters Patent, including a consecutive series of diverse movements timed to occur during the oscillation of the said rock-shaft. And to govern and control the oscillation of said secondary rock-arm and rock-shaft, said secondary rock-arm is linked, by the connection 16, with the further rock-arm 17 secured on the rock-shaft 18, to which rock-shaft are also secured the rock-arms 19 to whose free ends the dash-pot cylinder 20 is pivotally attached. The dash-pot piston 21 is secured on the lower end of the piston-rod 22, and the upper end of said piston-rod 22 is pivotally swung on the pivot 23. It is obvious that as the rock-shafts oscillate the dash-pot cylinder will be reciprocally raised and lowered in relation to the piston, the piston-rod swinging back and forth on its pivot, all in the manner particularly set forth on page 8 of the specification of the aforesaid Patent 853543. And, as the cylinder reciprocates, the oil or other resistant liquid in the dash-pot will flow from one side of the piston to the other, around such piston and through the ports 24 and 25 that penetrate said piston, the check plate 26 and the ball valve 27 retarding such flow during the upstroke of the cylinder, such ball valve dropping to open the port 24 during the down stroke of the cylinder, in the manner described in the aforesaid Patent 853543. But in the mechanism of my present invention I have provided a check-rod 28 having its opposite ends rigidly fixed in the opposed heads of the dash-pot cylinder, and passing freely through the port 25 in the piston and an aperture 29 in the check-plate 26 immediately above said piston-port; and intermediate the limits of the

stroke of the piston up and down a part of its length this check-rod is reduced in diameter, at 30, so that while the piston is passing over such reduced portion of said check-rod the port 25 will offer an increased free aperture for the flow of the resistant oil from one side of the piston to the other. And at either end, and within the limit of the piston's stroke, such reduced portion of the check-rod is tapered out, at 31 and 32, to the full diameter of said check-rod, so that at the limit of the piston's stroke the said check-rod will nearly close the aforesaid port 25. By this device it is obvious that the piston will be cushioned to the maximum extent at either limit of its stroke but be relatively free throughout the intermediate period of said stroke. And the practical result of thus varying the resistance that the dash-pot offers to the movement of the actuating rock-shafts of the adding machine, is to provide an effective cushioning of such movement at either limit of each back and forth movement of the operating handle of the main rock-shaft and yet reduce the resistance to movement during the intermediate period of each stroke. In this manner any shock or jar may be effectively prevented at the limit of the forward pull of the operating handle or rock-shaft, and yet the reduction of the resistance offered by the dash-pot during the antecedent period of the stroke will substantially lighten and lessen the "pull" by which the adding machine is actuated. The adding machine may thus be operated with less exertion on the part of the operator, or less strain on any motor-drive device that is substituted for hand operation; and yet the machine is still effectively protected against shock or jar resulting from either a violent forward jerk of the operating handle, or its shaft, or the violent backward jerk that results when the adding machine is locked and the main rock-shaft is rocked and released under the tension of the main spring-connection.

My invention is hereinabove set forth as embodied in one particular form of construction, but I do not limit it thereto or to less than all the possible forms wherein the said invention as hereinafter claimed may be embodied and distinguished from prior devices for like purpose.

I claim:—

1. In a printing adding-machine, in combination, adding and printing mechanism, an actuating rock-shaft therefor, operating connections between said mechanism and said rock-shaft, such operation of the adding-and-printing mechanism including a consecutive series of diverse movements timed to occur during the oscillation of the said rock-shaft, and a dash-pot for governing the operation of said connections, said

dash-pot being internally provided with means for automatically varying, during each stroke of the piston in each direction, an aperture through which the resistant liquid flows from one side of the piston to the other, whereby a varying resistance and cushioning of said piston is effected, accommodating the varying resistances of the consecutive series of diverse movements in said adding-and-printing mechanism, substantially as specified.

2. In a printing adding-machine, in combination, adding and printing mechanism, an actuating rock-shaft therefor, operating connections between said mechanism and said rock-shaft, such operation of the adding-and-printing mechanism including a consecutive series of diverse movements timed to occur during the oscillation of the said rock-shaft, and a dash-pot for governing the operation of said connections, said dash-pot being internally provided with a fixed check-device for automatically varying, during each stroke of the piston in each direction, an aperture through which the resistant liquid flows from one side of the piston to the other, whereby a varying resistance and cushioning of said piston is effected, accommodating the varying resistances of the consecutive series of diverse movements in said adding-and-printing mechanism, substantially as specified.

3. In a printing adding machine, in combination, adding and printing mechanism, an actuating rock-shaft therefor, operating connections between said mechanism and said rock-shaft, such operation of the adding-and-printing mechanism including a consecutive series of diverse movements timed to occur during the oscillation of the said rock-shaft, and a dash-pot for governing the operation of said connections, said dash-pot being internally provided with a fixed check-rod passing transversely through a port in the piston, said check-rod being reduced for a part of its length intermediate the limits of the reciprocation of the piston, whereby the flow of the resistant liquid through said port, from one side of the piston to the other, is automatically varied during each piston-stroke, to vary the resistance and cushioning of the piston, accommodating the varying resistances of the consecutive series of diverse movements in said adding-and-printing mechanism, substantially as specified.

4. In a printing adding machine, in combination, adding and printing mechanism, an actuating rock-shaft therefor, operating connections between said mechanism and said rock-shaft, such operation of the adding-and-printing mechanism including a consecutive series of diverse movements timed to occur during the oscillation of the said rock-shaft, and a dash-pot for govern-

ing the operation of said connections, said
dash-pot being internally provided with a
fixed check-rod passing transversely through
a port in the piston, said check-rod being
5 reduced and tapered for a part of its length
intermediate the limits of the reciprocation
of the piston, whereby the flow of the resist-
ant liquid through said port, from one side
of the piston to the other, is automatically
10 varied during each piston-stroke, to vary
the resistance and cushioning of the piston,

accommodating the varying resistances of
the consecutive series of diverse movements
in said adding-and-printing mechanism, sub-
stantially as specified. 15

In testimony whereof I have hereunto set
my hand in the presence of two subscribing
witnesses.

FREDERICK A. NIEMANN.

Witnesses:

HENRY LOVE CLARKE;
HARRY B. WYETH.