

EXCLUSIVE MAGICAL SECRETS



COLES

PART X.

Automata.

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Automata.

AS far back as the history of magic extends, we find that automata were constructed and exhibited. The effects of the oracles of ancient Rome and Greece were produced to a large extent by ingenious apparatus. But it was not until the seventeenth century of the present era that automata of the highest degree of skill were constructed.

About the year 1650 a Frenchman named Camus produced a marvellous coach. Horses were harnessed to it, a coachman was on the box, a footman and a page were in their places behind, and a lady was seated inside. When a spring was touched, the coachman smacked his whip and the horses proceeded in a natural manner, drawing after them the carriage. After executing various evolutions the coach stopped. The page then descended and opened the door, and the lady alighted. A moment or two later she re-entered the coach. The page put up the steps, closed the door, and resumed his station. The coachman whipped his horses, and the carriage was driven back to its original position. It is recorded that this extraordinary piece of apparatus was exhibited before the King of France and other monarchs of the period.

Another automaton of similar character was the Duck of Vaucason. It was of the size of life, and so perfect an imitation of the living animal that all the spectators were deceived. It executed, says Brewster in his "Letters on Natural Magic," all the natural movements and gestures.

It ate and drank with avidity, performed all the quick motions of the head and throat which are peculiar to the duck, and, like it, muddled the water which it drank with its bill. It produced also the sound of quacking in the most natural manner. In the anatomical structure the inventor exhibited the highest skill. Every bone in the real duck had its representative in the automaton, and its wings were anatomically exact. Every cavity, apophysis, and curvature was imitated, and each bone executed its proper movements. When corn was thrown down before it, the duck stretched out its neck to pick it up, swallowed, and digested it.

But the automata which have most interested the public have been the various writing and drawing figures. Perhaps the earliest of these was the writing figure invented by Frederick Von Knauss in the year 1760. In that notable book, "The Unmasking of Robert Houdin," Harry Houdini gives a full account of this and later inventions on the same lines. Particularly interesting is the passage in the book which deals with the automata constructed by Pierre Jacquet-Droz and his son Henri-Louis, the famous Swiss mechanics, towards the end of the eighteenth century. Houdini states that years were spent in perfecting them, and that they have not been equalled or even approached by later mechanics and inventors. He also suggests that Robert Houdin and other magicians of a later day who produced automata as part of their show, did not actually invent them, but copied the figures constructed by Pierre Jacquet-Droz and his son.

Speaking generally, however, the secrets of automata have been well kept by their inventors. So much so that it has always been a difficult matter for a magician to secure an effective figure for his performances. During recent

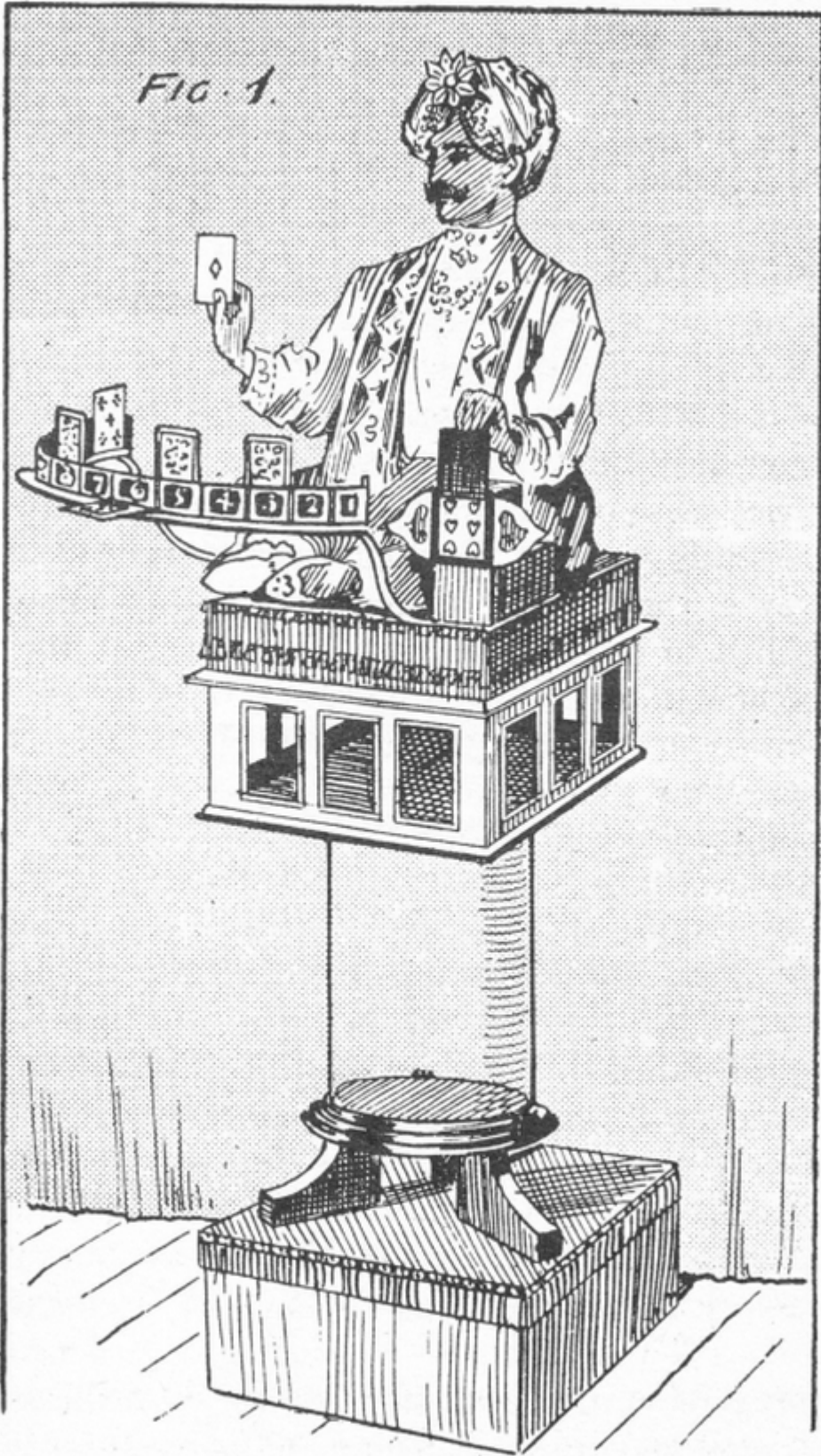
years I have known several men who have expended much money and time in attempting to secure such a figure, and who have failed to do so. In this section of "Exclusive Magical Secrets" a remarkable automaton is fully described. The sketches illustrating it have been drawn from the actual apparatus, which is the property of A. W. Gamage, Ltd. With the aid of these sketches, and of the accompanying letterpress, those of my subscribers who have some skill in mechanical work will be able to construct the automaton themselves. If they have not that skill, they can easily obtain the assistance of a practical man. In that case, however, they must not allow him to discover the whole secret. They can avoid this by doing one or two essential parts of the work themselves.

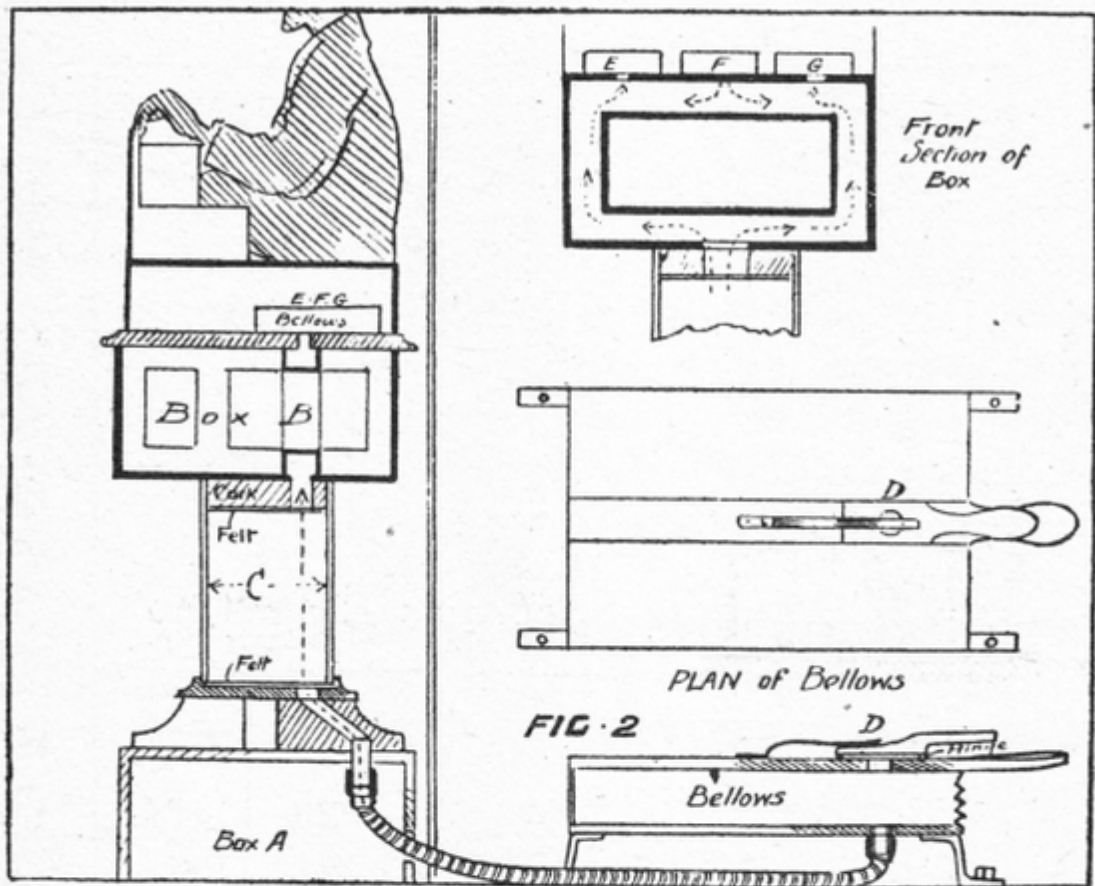
The Whist-Playing Automaton.

Strictly speaking, none of the figures which are known to the conjuring world as automata rightly deserve that description. The meaning of the word "automaton"—I quote from Webster's Dictionary—is, "A self-moving machine, or one which has its moving power within itself." Now, as common sense tells us that a figure which plays whist or draws a picture must be actuated by some unseen motive power, it follows that these figures are not automata in the strict sense of the word. A figure which plays whist cannot possibly have its "moving power within itself."

However, the word "automaton" has for many years been applied to certain machines which imitate the movements of human beings, the "moving power" which causes the figures to work being hidden—more or less cleverly, according to the skill of the maker of the automaton. The word "automaton" is not usually applied—at any rate, by conjurers—to a "self-moving machine," which can be made to perform the same actions over and over again. One would hardly give the name "automaton" to such a thing as a model of a mill which is made to "work" by the dropping of a penny into the machine. This particular kind of toy, which so many people believe to be of recent invention, was thought of and produced some two thousand or more years ago, and automata—not quite the machines which conjurers refer to when they speak of automata—were known many years before the first "penny-in-the-slot" machine was made.

I now propose to explain the working of a whist-playing automaton of modern construction, and if readers will study





the illustrations with the letterpress, I think they will be able to form a clear idea of how a figure, apparently without any assistance from anyone, can be made to play whist.

Fig. 1 is an illustration of the automaton as seen by the onlooker. The figure is shown raising a card with the right hand, and with the left hand lifting the lid of a box, which discloses another card. In actual practice these actions are parts of a separate programme or performance, but for the sake of saving needless repetition, they are shown on the same sketch.

The right hand is really engaged in a game of whist with cards dealt haphazard, and placed in the rack before the figure. The left hand is disclosing a card chosen by a member of the audience—an entirely different performance.

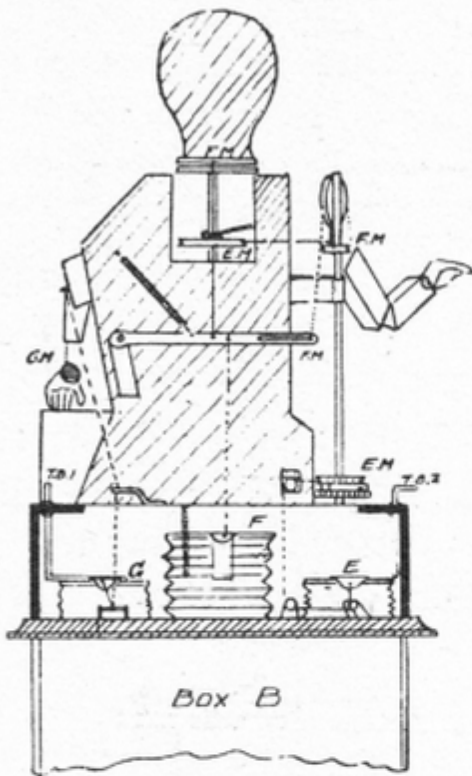


FIG. 3.

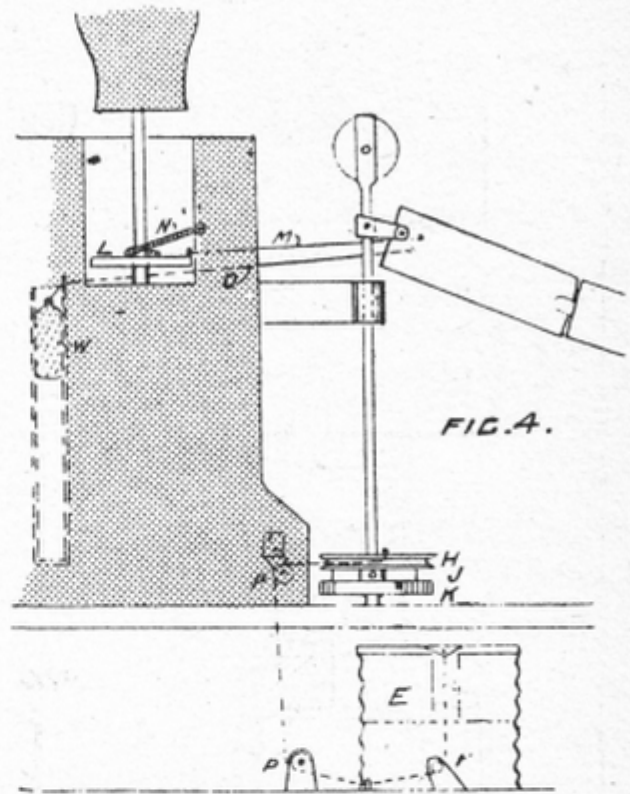
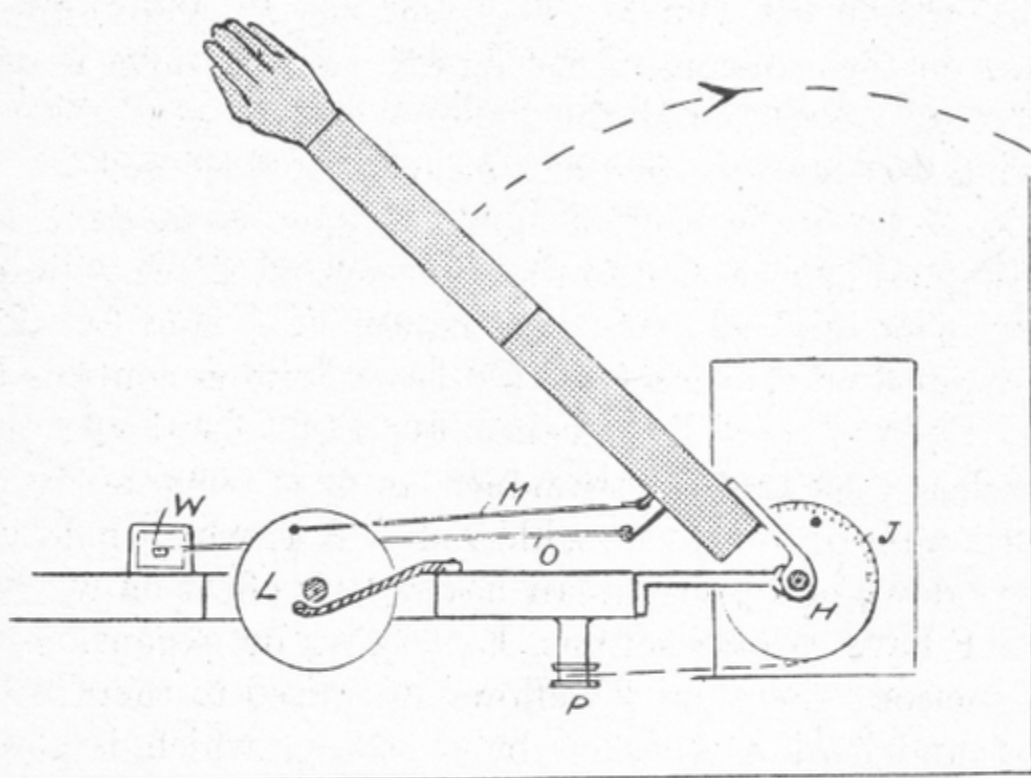


FIG. 4.

Three features are to be noted about the stand which supports the dressed figure. First, there is a clear way between the three supporting feet. Secondly, the cylinder is of clear glass, and the top and bottom ends are covered all over with baize. Thirdly, the box under the figure has pierced sides, and is demonstrated to be empty. Despite the apparent absence of human connection, the figure will play a hand of cards correctly against a bona-fide opponent; its hand stopping over the right card and lifting it from the rack, so that it can be clearly seen, before the hand drops the card into the tray in front of the rack.

Examination of Fig. 2, however, reveals the secret of the motive power. An assistant behind the back cloth can so manipulate a specially constructed pair of bellows that he controls the figure's actions by means of air expansion

FIG 4^A PLAN

and suction. By compressing or raising the bellows he forces or withdraws air through the flexible tube concealed by box A, through the back foot of the stand, and thus imperceptibly into the glass cylinder (the air penetrating the baize), round an enclosed channel way in box B (this channel appearing to be merely a bracing piece), and finally into the small bellows fixed under the seat of the figure, E, F, G. These three bellows work the interior mechanism of the figure in a manner which will be explained.

The large bellows have on the top a valve D, normally closed by a spring, as seen in sketch. The underside of valve piece is covered with thick felt, which closes air-hole, and in this condition bellows cannot be used without having

some effect on the figure. This fact has an important influence on the working of the figure. If the valve is open all the air escapes, and the bellows can be used without affecting mechanism; this is also an important point.

Fig. 3 shows the back of figure stripped of drapery, and this diagram gives a clue to the functions of the three minor bellows concealed in seat under figure, E, F, and G. It is now understood that air from the large bellows controls the three. Now E and F influence the right hand of figure, which has a separate performance, so G is temporarily put out of action by the turnbuckle rod T B 1, which holds the bellows down and prevents air having any effect on it. But E and F have reverse actions, E working by expansion and F by suction; therefore F bellows are raised to their fullest extent and held in position by a spring, which is shown more clearly in Fig. 5. The filling of E with air causes it to turn arm and head together, marked on diagram E M. The suction on F causes it to raise arm and hand with card picked up, and also to tilt head backwards. See Figs. 4, 4a, and 5 for these movements.

When the chosen card act is being performed, E is put out of action by turning T B 2 and locking down bellows, and G is released. These bellows then work the left hand, G M. As it happens, the movements in this latter act have no suctional working, so there is no necessity to lock down F. For details, see Figs. 6 and 7.

An examination of diagrams 4 to 7 will now disclose the exact working of figure. Assume that the figure is to play a certain card. The assistant behind can see the rack and mark the position. He opens valve and raises bellows. He then allows the valve to close, and slowly presses bellows down. The air passes into E and raises it, and this pulls

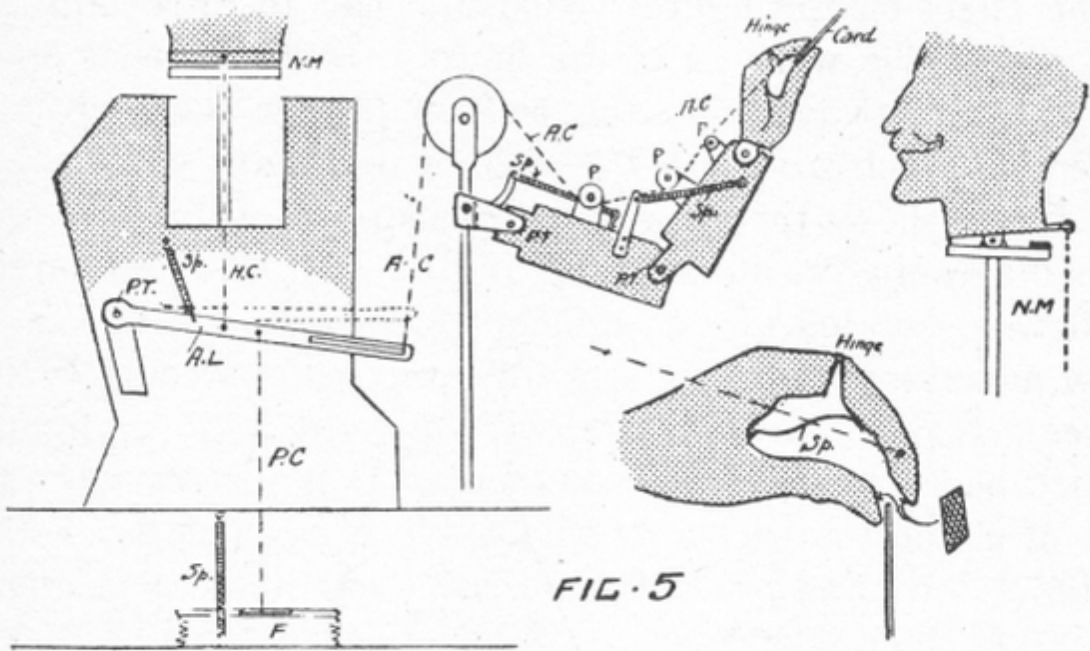
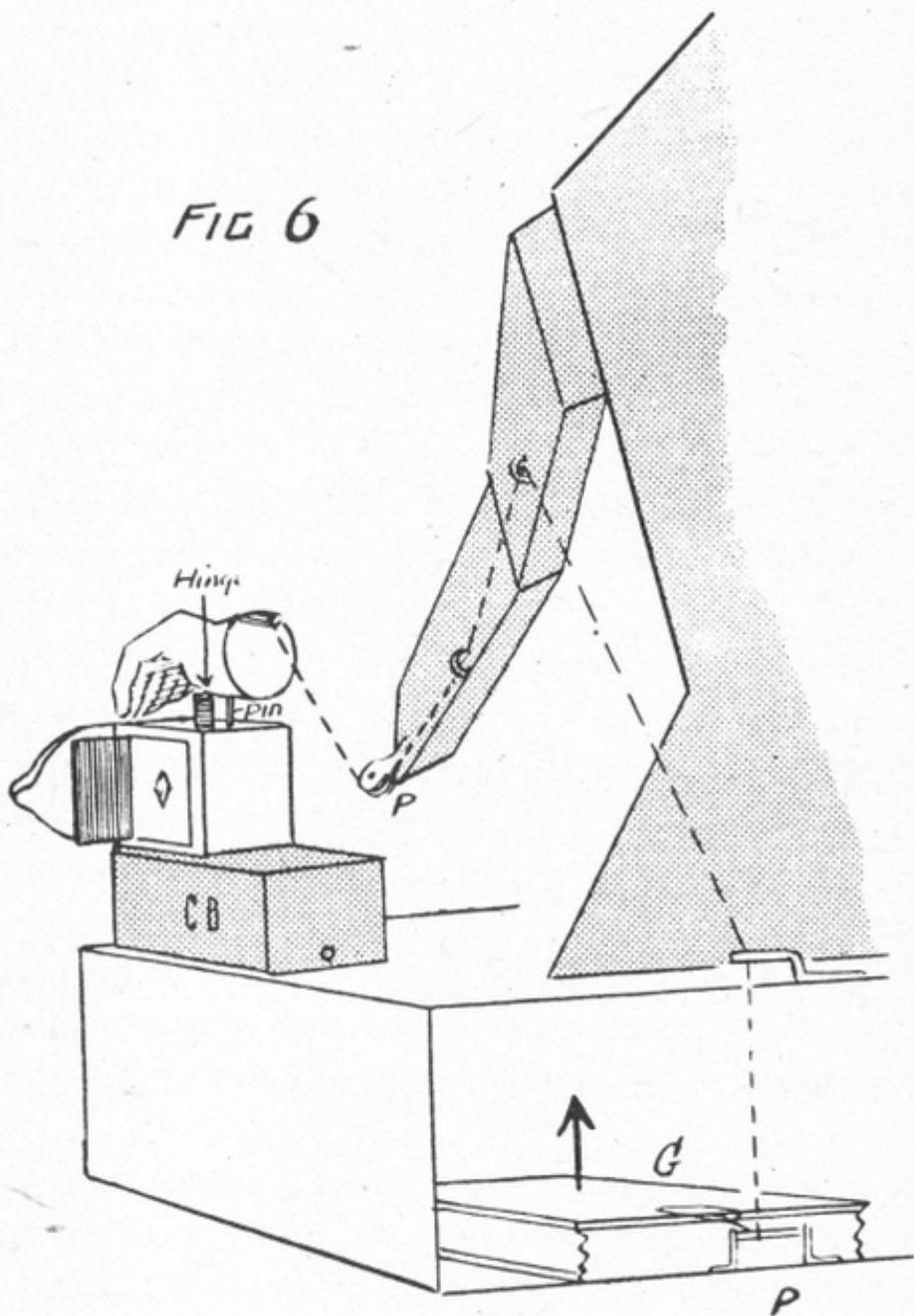


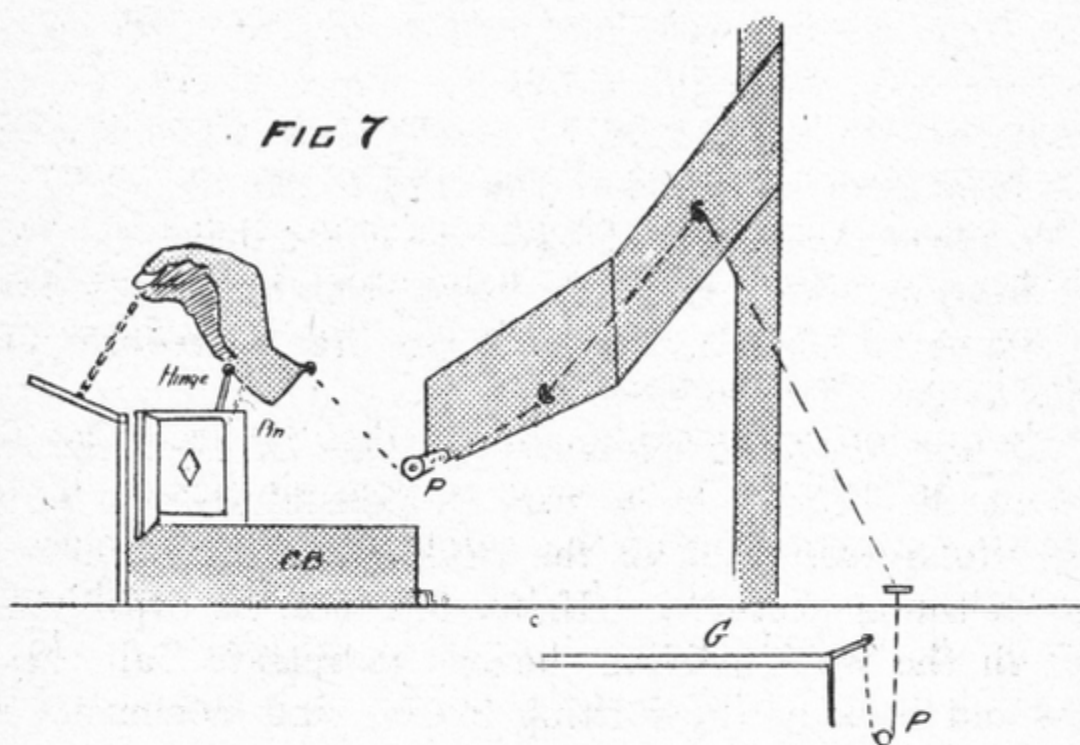
FIG. 5

on a cord which runs over various pulleys until it partially encircles the wheel H. The wheel commences to revolve, carrying with it the rod which has the right arm attached. The movement of the arm correspondingly draws on the cord M, which is attached to a disc L holding the neck spindle, and causes the neck also to revolve in the same direction. When the hand is immediately over the card the assistant stops the bellows, and the ratchet J drops into the toothed disc K, and locks the arm in the required position. (See Figs. 4 and 4a.) The cord O, the weight W, and the spring N are to return the arm and head to their normal position at the left-hand end of the rack, but these do not come into operation until the second part of the movement shown in Fig. 5 is completed.

The raising of the arm and hand with card is a distinct and separate movement. (See Fig. 5.) To commence with, the assistant opens the valve and lets down the bellows. He then closes the valve and pulls up the bellows. This



exhausts air in F, and attached cord P C commences to operate as follows. It first depresses the lever A L, thus pulling on the arm cord A C. This, running over the main wheel at top of arm rod and under and over the various pulleys P, acts on the hinged fingers and closes them on the card,



the serrated surface of thumb and fingers providing a grip. As the cord shortens it lifts the arm at the wrist, elbow, and shoulder joints until the face of the card is exposed to the audience.

The cord P C, in pulling down lever A L on pivot P T, also draws on head cord H C, and pulls head backwards as arm is raised. (The letter P in all diagrams denotes a pulley.)

The entire movement now accomplished, the assistant opens the valve of the main bellows, and bellows F and lever A L then rise by aid of the springs S P. The arm is thrown down by the various springs which have been in compression, the fingers open, and the card drops into tray. As the arm cannot return to its starting point because it is held by the ratchet, the bellows must be raised (with valve open), then shut and pressed down until the arm reaches the extreme limit of the rack. The ratchet is then free, and the arm

(Fig. 6) pulls on wrist, and causes pin to enter top of case and stop revolving cards, as shown in Fig 7, and, simultaneously, the fingers, by means of an attached chain, raise front door and disclose the card to the audience.

To recommence the trick, the assistant opens the valve and drops bellows. When the hand drops and closes down, the pin is withdrawn, and cards are free to revolve until signal is given for the next stop.

All the foregoing explanation makes it clear that the man at the bellows is a very responsible person in the successful presentation of the automaton, and he must be sure of timing correctly. If, for instance, he overshoots a card in the whist playing, he has to release "all," bring the hand back to the starting point, and commence the movement over again.